Exploits Generation: Proposed Goodyear's Dam Life Extension Project

Environmental Assessment Registration Pursuant to the Newfoundland & Labrador Environmental Protection Act (Part X)

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Abbreviations and Glossary

Abbreviations

Abbreviation	Definition
AC CDC	Atlantic Canada Conservation Data Centre
AND	Anglo Newfoundland Development Company
CDA PSAD	Canadian Dam Association – Public Safety Around Dams
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans Canada
DSR	Dam Safety Review
EA	Environmental Assessment
ECCC	Environment and Climate Change Canada
EIS	Environmental Impact Statement
EMS	Environmental Management System
EPP	Environmental Protection Plan
ERMA	Environmental Resources Management Association
FFA	Flood Frequency Analysis
GFW	Grand Falls–Windsor
GHG	Greenhouse Gas
ISO	International Organization for Standardization
MW	Megawatt
NAPS	National Air Pollution Surveillance (Program)
NL	Newfoundland and Labrador
NL EPA	Newfoundland and Labrador *Environmental Protection Act*
NL ESA	Newfoundland and Labrador *Endangered Species Act*
NLDWT	Newfoundland and Labrador Department of Transportation and Works
NLDECCC	Newfoundland & Labrador Department of Environment, Conservation and Climate Change
NLDFAL	Newfoundland & Labrador Department of Forestry, Agriculture and Lands
NLH	Newfoundland and Labrador Hydro
NOC	National Occupational Classification
PAO	Provincial Archaeology Office
SARA	Species at Risk Act
VC	Valued Component (in an EA context)
WHMIS	Workplace Hazardous Materials Information System
WSC	Water Survey of Canada
WSP	WSP Canada Inc.

Glossary of Terms

Term	Explanation
Anadromous	Fish that migrate from the sea into freshwater rivers to spawn.
Auxiliary Water Supply System	An additional water source or mechanism designed to ensure adequate flow in fishways or other structures, especially during low water conditions.
Bedrock Outcropping	Exposed sections of solid rock at the earth's surface, often visible in riverbeds or construction sites.
Buttressing (Rockfill Buttressing)	The process of reinforcing a dam or structure with additional rock material to improve stability and extend service life.
Cofferdam	A temporary water-tight enclosure within or across a body of water to allow construction work in a dry area.
Concrete Gravity Dam	A type of dam constructed from concrete that relies on its own weight to resist the force of water.
Decommissioning	The process of taking a facility, structure, or equipment out of service and safely closing or removing it.
Environmental Assessment (EA)	A formal process to evaluate the potential environmental impacts of a proposed project, as required by legislation.
Environmental Protection Plan (EPP)	A document outlining procedures and measures to minimize environmental impacts during construction and operation.
Fish Passage / Fishway	Structures or modifications that enable fish to bypass obstacles (like dams) during migration.
Frazil Ice	Small, loose ice crystals that form in supercooled, turbulent water, often causing operational issues at hydroelectric facilities.
Head Pond	The body of water immediately upstream of a dam, used to maintain water levels for power generation or ice control.
Hydroelectric Generation Station	A facility that produces electricity by harnessing the energy of flowing water.
Infill (infilled)	The process of filling a structure or area (such as a fishway) with material, often as part of decommissioning.
Laydown Area	Designated space near a construction site for storing materials, equipment, and temporary facilities.
Mitigation Measures	Actions taken to reduce or eliminate negative environmental impacts of a project.
Peak Particle Velocity	A measure of the maximum speed at which particles in the ground move during blasting, used to assess potential damage to structures and habitats.
Riprap	Large rocks or other material placed along shorelines, riverbanks, or dam faces to prevent erosion and absorb energy from water flow.
Run of River Plant	A hydroelectric facility that generates power using the natural flow and elevation drop of a river, with little or no water storage.
Salmonid	A family of fish that includes salmon, trout, and char, many of which are important for recreational and commercial fisheries.
Service Life	The expected period during which a structure or component remains functional and safe for use.

Term	Explanation
Sluice Gate	A movable barrier used to control water flow in a dam or channel.
Stage 1 Historic Resources Assessment	An initial study to identify the presence or potential for historic or archaeological resources in a project area.
Thalweg	The line of lowest elevation, fastest flow, and greatest depth along a riverbed or valley floor.
Valued Components (VCs)	Key element (e.g., air, water, wildlife, socioeconomic factors) that are considered in environmental assessments due to their ecological, cultural, or economic importance.

Executive Summary

This Environmental Assessment (EA) Registration supports the proposed Goodyear's Dam Life Extension Project, a key initiative by Newfoundland and Labrador Hydro to maintain the reliability and safety of hydroelectric operations on the Exploits River. The project is subject to review under the Newfoundland and Labrador *Environmental Protection Act*, and this EA Registration provides a comprehensive overview of the project's purpose, scope, environmental context, and anticipated effects.

Project Overview and Rationale

Goodyear's Dam, constructed in 1911 and located approximately 4 km upstream of the Grand Falls Generating Station in Central Newfoundland, is essential for ice control and water management in the Exploits River. Recent assessments have identified ongoing deterioration and movement within the dam, following emergency repairs in 2015. Lack of intervention could result in dam failure which could have significant impacts, including disruption of power generation, impediments to fish migration, loss of salmon habitat, economic losses for upstream stakeholders, and increased safety and environmental risks for the local community.

To address these risks, NLH proposes a life extension project that includes:

- Staged rockfill buttressing to reinforce both the north and south sections of the dam;
- Construction of a new vertical slot fishway on the south side to enhance fish passage for Atlantic salmon;
- Infilling and abandonment of the deteriorated north fishway after the new structure is operational; and
- Creation of laydown areas to support construction and maintenance.

Environmental Assessment Approach

The EA process is designed to identify, predict, and evaluate potential environmental effects associated with the project, and to ensure that appropriate mitigation measures are implemented. This assessment considers a range of valued environmental components (VCs), including:

- Atmospheric Environment: Assessment of air quality, noise, and dust impacts during construction and operation, with mitigation measures such as dust control and equipment maintenance.
- Terrestrial Environment: Evaluation of potential effects on vegetation, soils, and wildlife, with a focus on minimizing habitat disturbance and protecting species at risk.
- Aquatic Environment: Analysis of water quality, fish and fish habitat, and maintenance of fish passage, with the majority of construction activities impacting aquatic life scheduled outside key migration periods and the implementation of best practices for sediment and erosion control.
- Socioeconomic Environment: Consideration of historic resources, land and resource use, community health, and well-being, and local economic benefits, with measures to minimize disruption.

This assessment also addresses cumulative effects, accidental events, and identifies relevant permits, approvals, and regulatory standards for the Project.

Consultation and Engagement

NLH has engaged with regulatory agencies, Indigenous groups, local governments, stakeholders, and the public to identify concerns, gather local knowledge, and inform project planning. Public open houses conducted in February and ongoing stakeholder engagement have ensured that community input is incorporated into environmental management.

Conclusion

The Goodyear's Dam Life Extension Project has been developed in response to identified structural and dam safety risks and the need to maintain critical hydroelectric infrastructure in the Exploits River system. The environmental assessment process has systematically evaluated the potential effects of the project and identified mitigation measures to avoid or reduce adverse impacts. Through the implementation of these measures and ongoing engagement with stakeholders, the project is expected to proceed in a manner that is consistent with regulatory review and decision-making regarding the project. Therefore, anticipated residual impacts will not be significant.

1. Introduction

1.1 Nature of the Undertaking

Since 2009, Newfoundland and Labrador Hydro (NLH) has managed and operated the hydroelectric facilities on the Exploits River on behalf of the Government of Newfoundland and Labrador.

The existing hydroelectric generating station at Grand Falls-Windsor (Figure 1.1) is operated and maintained by NLH's Exploits Generation Operations team and has an electrical generating capacity of 80 megawatts (MW). The Grand Falls facility includes the Goodyear's Dam site, the Grand Falls main dam extending across the Exploits River at the Generating Station, spill gates, a power canal with intake structures and associated penstocks to supply the two vertical generating units and four double runner horizontal units, fish by pass systems, and nearby transformers and terminal stations which are used to transmit the electrical output of the facility to the Island grid.

The proposed undertaking is located at the Goodyear's Dam site, approximately 4 km upstream of the Grand Falls Generating Station which consists of an earthen embankment dam, a central rockfill and timber crib spillway, an auxiliary rockfill over spillway section, and fishways on the north and south (infilled) extents of the dam. The focus of this package is on the timber crib structure and fishway. This project does not impact the embankment dam. The primary purpose of Goodyear's Dam is to control frazil ice.

NLH's main areas of focus for its operations include a commitment to safety, the environment and the operational performance of their assets. In line with this commitment, NLH is planning a comprehensive life extension project for Goodyear's Dam, originally constructed in 1911, which experienced partial failure requiring emergency repairs in 2015. Recent structural assessments have identified ongoing movement and deterioration, necessitating further repairs to extend the dam's service life by approximately 10 years, at which point the structure will be re-assessed to determine what may be required for rehabilitation.

The project scope includes the installation of rockfill buttressing across the entire Goodyear's Dam overflow structure on the downstream side, sequenced over multiple years (2026-2028), and the construction of a new fishway on the south side of the structure to enhance fish passage and address the limitations of the existing, deteriorating north fishway. The project also incorporates construction of temporary laydown areas, with multiple potential configurations under consideration.

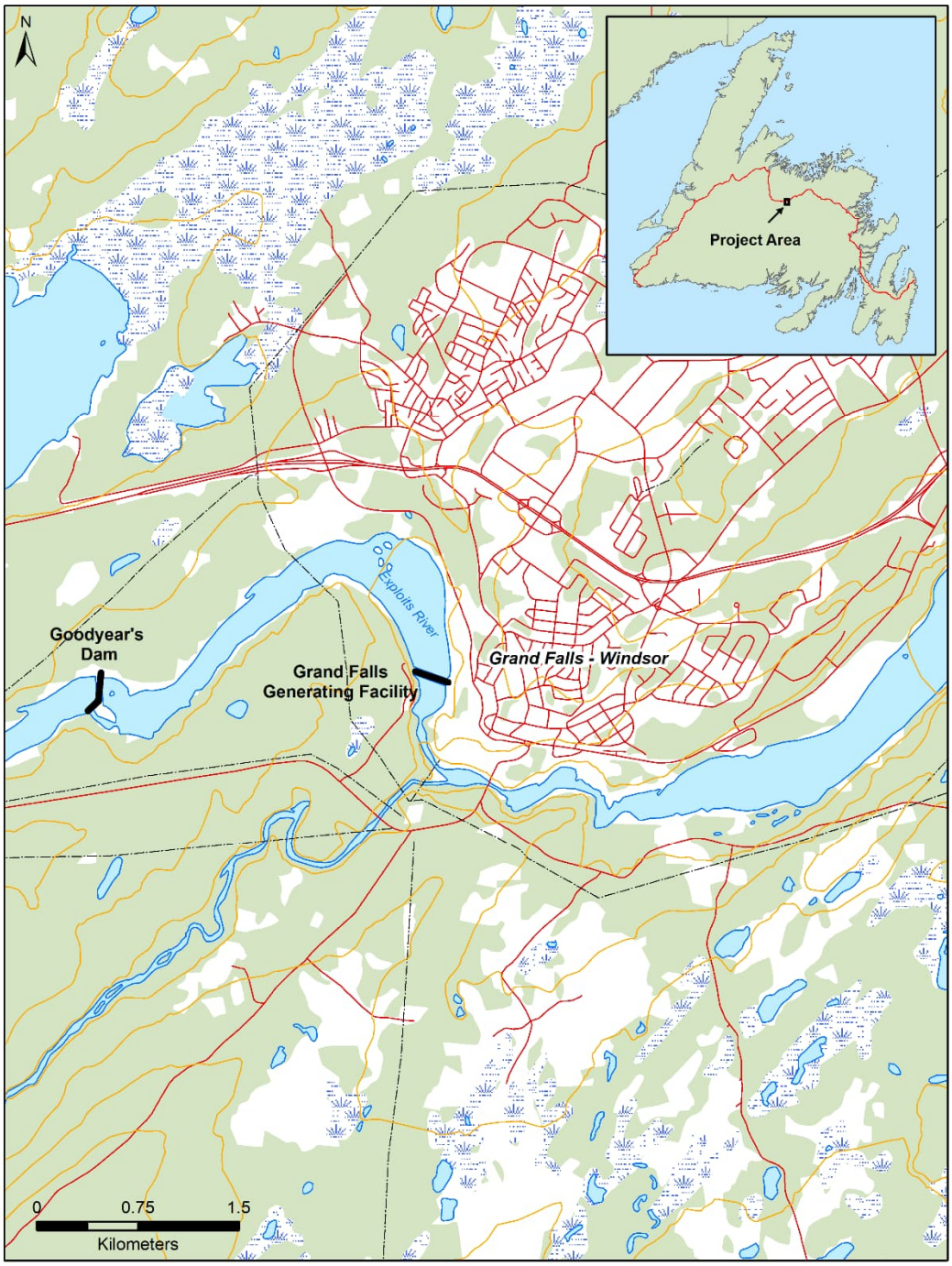


Figure 1-1 Location of the Grand Falls Hydroelectric Generating Station

Construction activities are planned to be completed in stages over a three-year period, with all in-water work scheduled after the annual salmon run to protect fish migration. The new fishway passage will be constructed prior to major buttressing activities to ensure uninterrupted fish passage and will be available for monitoring during subsequent construction phases. The north fishway will be removed from service and infilled after completion of the new fishway as part of buttressing of the northern part of the dam.

Throughout the project, the Grand Falls Generating Station will continue to operate in accordance with current operational parameters.

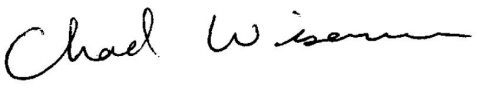
1.2 Purpose of the EA Registration

The proposed Project is subject to Part 10 of the *Newfoundland and Labrador Environmental Protection Act* and the associated Environmental Assessment Regulations. This Environmental Assessment (EA) Registration is intended to initiate the provincial environmental assessment (EA) review for the Goodyear's Dam Life Extension Project, and in doing so it:

- Identifies the Project's proponent and describes its goals, core values, and environmental management approaches and procedures;
- Describes the proposed Project, including its overall purpose and rationale, as well as its key components and planned construction and operational activities;
- Describes the proposed Project-related consultation activities by NLH during 2025 and to be undertaken in 2026; and
- Provides an overview of the existing environmental setting for the Project, some of the potential environmental considerations that have been identified to date, and NLH's planned approaches for addressing these in moving forward with Project planning and eventual implementation.

1.3 The Proponent

Name of Corporate Body:	Newfoundland and Labrador Hydro
Address:	Hydro Place, 500 Columbus Drive P.O. Box 12400 St. John's, Newfoundland and Labrador Canada A1B 4K7 Tel. (709) 737-1440, Fax. (709) 737-1800
President:	Jennifer Williams
VP Hydro Operations:	Chad Wiseman



Signature

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Newfoundland and Labrador has an immense and diverse energy portfolio. NLH is the operator of the existing electrical generation facilities on the Exploits River and is the Proponent of the proposed Goodyear's Dam Life Extension Project (the Project).

NLH is the primary generator of electricity in the province with an installed generating capacity of 1,769.6 MW on the island of Newfoundland. The company generates and transmits over 80 percent of the electrical energy that is used by Newfoundlanders and Labradorians, most of which is comprised of clean, hydroelectric generation.

NLH is committed to delivering safe, reliable, least-cost power to industrial, utility and over 38,000 direct customers in 200 communities in rural Newfoundland and Labrador and has been doing so for more than 50 years. In addition to the 80 MW hydroelectric generation capacity operated by NLH at the Grand Falls Generating Station, NLH's regulated assets include eight hydroelectric generating stations (7,216 MW), one oil-fired plant (490 MW), four combustion turbines (245 MW), and 23 diesel plants, and the company also maintains 54 high-voltage terminal stations, 25 lower-voltage interconnected distribution stations, and thousands of kilometres of transmission and distribution lines throughout the province.

NLH is focused on long-term strategic capital planning to ensure an on-going, reliable source of electricity now and for future generations. Its continuous infrastructure upgrades and use of new technology are some of the ways in which the company commits to providing excellent customer service. The utility is fully dedicated to operational excellence and environmentally sound practices while delivering reliable service at the least cost.

Additional information on NLH, including its overall organization, values, priorities and activities, can be found at the NLH website: www.nlhydro.com.

NLH strives to be a leader in environmental protection and sustainability and is committed to maintaining a high standard of environmental responsibility and performance. NLH has constructed and currently operates an extensive electricity generation and transmission system throughout Newfoundland and Labrador (Figure 1-2). This includes interconnected electrical power systems on the Island and in Labrador, as well as isolated distribution systems in rural areas of the province.

Environmental protection planning is an integral part of NLH's planning, construction, operations and maintenance programs. NLH has chosen the ISO 14001 Environmental Management System (EMS) standard developed by the International Organization for Standardization (ISO) to manage environmental aspects of their operations. The Goodyear's Dam Life Extension project will be undertaken in accordance with the applicable policies and procedures of the EMS. The corporation has an outstanding record of environmental protection and stewardship, and this objective and experience will be applied to the planning and development of this Project to avoid or reduce potential environmental effects during its various phases.

Figure 1-2 Existing Newfoundland and Labrador Generation and Transmission System (Ref: Provincial Generation & Transmission Grid - 2 Sheets - 2024-02.cdr)

1.4 Environmental Assessment Process and Requirements

The Newfoundland and Labrador *Environmental Protection Act (NL EPA)* requires anyone who plans a project that could have a significant effect on the natural, social or economic environment (an "Undertaking") to present it for examination through the provincial EA process. Under the *NL EPA* (Section 2. (mm).), an Undertaking includes:

> "*an enterprise, activity, project, structure, work or proposal and a modification, abandonment, demolition, decommissioning, rehabilitation and an extension of them that may, in the opinion of the minister, have a significant environmental effect*"

The associated *Environmental Assessment Regulations* (Part 3) list those projects (potentially including proposed modifications, rehabilitations and extensions of same) that require registration and review. Specifically, Section 28 of the *Environmental Assessment Regulations* states that:

> *28. An undertaking that will occur within 200 metres of the high-water mark of a river that is a scheduled salmon river under the Fisheries Act (Canada) shall be registered.*

For projects that are subject to the Newfoundland and Labrador EA process, project proponents are required to prepare and submit an EA Registration document describing the proposed undertaking. Following public and governmental review of the Project's EA Registration, the provincial Minister of Environment, Conservation and Climate Change will determine whether the Project may proceed, subject to any terms and conditions and other applicable legislation, or whether further assessment is required – an Environmental Preview Report (EPR) and/or an Environmental Impact Statement (EIS) (Figure 1.3).

In addition to approvals under the provincial EA process, the Project may also require a number of other authorizations from relevant regulatory authorities. These are identified and discussed further in this document and in Appendix A.

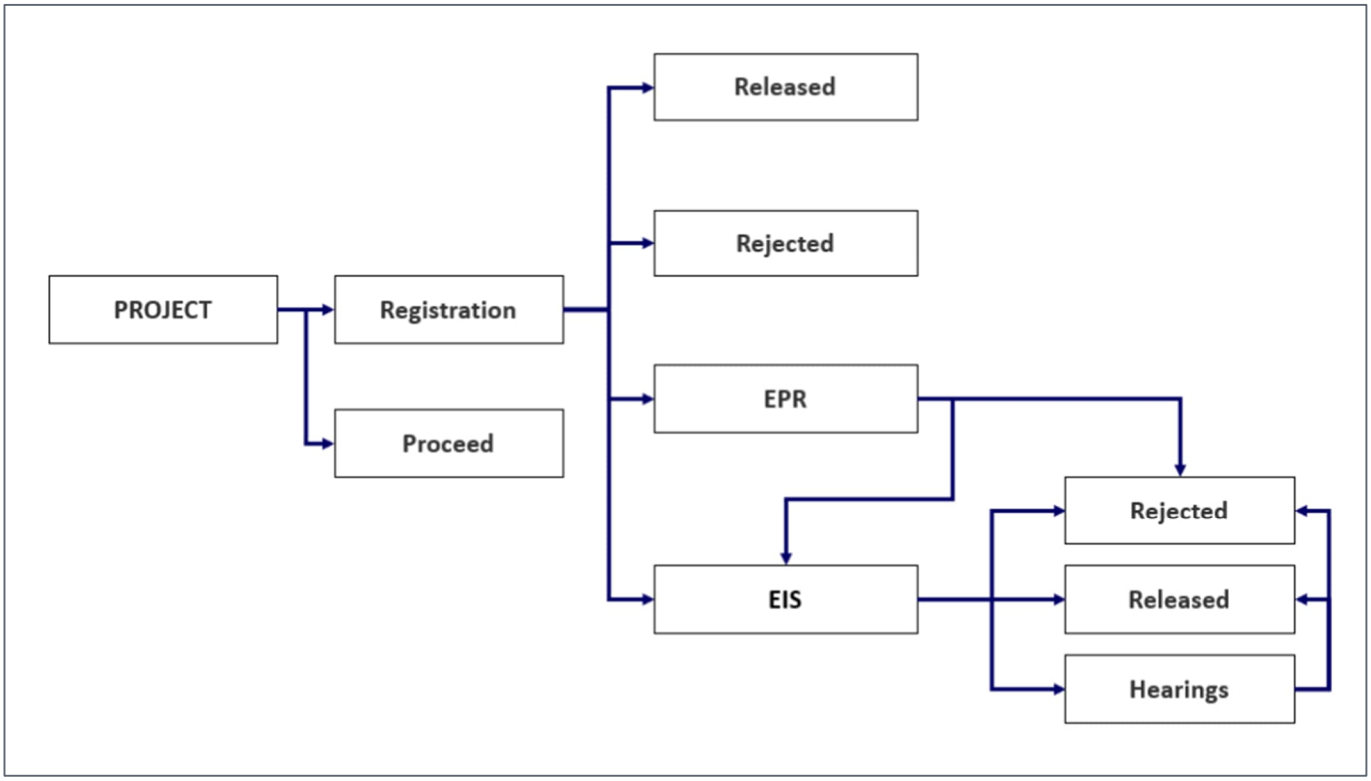


Figure 1-3 Overview of the Newfoundland and Labrador EA Process

2. Project Description and Scope

The proposed Project will involve the life extension of the existing Goodyear's Dam through the installation of staged rockfill buttressing and the construction of a new fishway. Construction activities are currently planned to be completed in stages over a three-year period (2026-2028).

The following sections provide a description of the proposed Project, including an overview of the existing Grand Falls generation facilities, which include Goodyear's Dam. A review of the purpose and history of Goodyear's Dam is also provided as background and context, and the primary components and activities that will be involved in the planned life extension works are described. It should be noted that the proposed Project that is the subject of this EA Registration - and for which EA approval is being sought - includes only the proposed life extension works and associated new infrastructure at Goodyear's Dam. The Project does not include any changes to any other associated generating infrastructure at Grand Falls and will not result in any changes to the generating capacity or operation of these facilities. The scope of the Project for EA purposes therefore does not include the on-going and future operation of these long-standing generation facilities by NLH.

2.1 Overview of Existing Exploits Generation

The Exploits River watershed spans a land area of approximately 10,000 km^2 extending from the southwest corner of the Island of Newfoundland and northeast to the Bay of Exploits, with approximately half of the watershed draining into Beothuk Lake and the remaining portion into the Exploits River. NLH currently operates three hydroelectric generating stations in the Exploits watershed, with facilities at Star Lake, Bishop's Falls and Grand Falls, as well as various water control structures, gauging stations and other associated infrastructure throughout the system (Figure 2.1). A fourth Generating Station at Buchans is managed by NLH but is no longer operational. Also, Newfoundland Power owns and operates the Sandy Brook generating station on the Exploits River watershed, just upstream of Goodyears Dam. Approximately half of the Exploits River watershed is controlled.

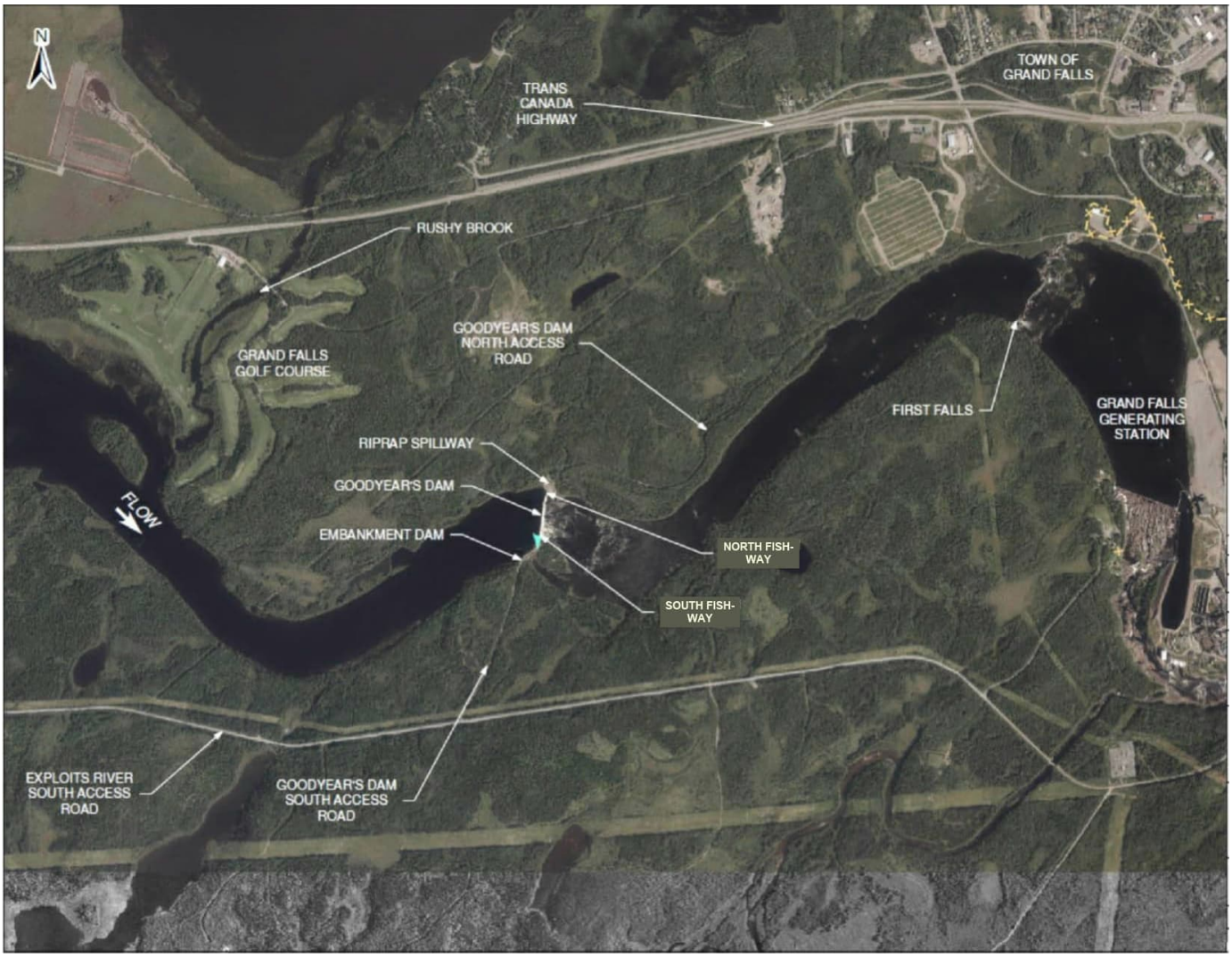
The generating station at Grand Falls is the largest of the three stations operated by NLH in the Exploits River Watershed. It is located approximately 85 km downstream from the main storage dam at Beothuk Lake, and immediately adjacent to the former Abitibi pulp and paper mill plant (now decommissioned), on the southwestern side of the community of Grand Falls – Windsor.

2.1.1 Grand Falls Generating Station Operation

The hydroelectric potential at Grand Falls was first harnessed in 1906 by the Anglo Newfoundland Development (AND) Company, and the facility has since been modified, expanded and upgraded to the current installed capacity of 80 MW. NLH has managed and operated this and other hydroelectric facilities on the Exploits River on behalf of the Government of Newfoundland and Labrador since 2009.

Figure 2-1 Existing Dam Structures on the Exploits Watershed

The Grand Falls hydroelectric generation facility consists of the Grand Falls Generating Station and associated infrastructure and the Goodyear's Dam spillway and fishway, the focus of this EA Registration, located approximately 4 km upstream (Figure 2.2). The total power plant output of 80 MW is produced from a head of approximately 100 feet (30.5 m), and the facility is a run of river plant with virtually no water storage in its head pond. The total Exploits River watershed upstream of Grand Falls is approximately 8,390 km2. Water is released from the main storage dam at Beothuk Lake (Millertown Dam) to maintain the required level of water flow and electrical generation at Grand Falls and other facilities. Goodyear's Dam creates a small reservoir in the river in advance of the Grand Falls facility for ice control purposes.



Source: NLH 2022 Public Safety Plan – Grand Falls and Goodyears Systems, Figure 2)

Figure 2-2 Goodyear's Dam Site Layout

2.1.2 Goodyear's Dam Purpose and History

The purpose of Goodyear's Dam is to help reduce frazil ice formation during winter operations. The slope, depth and cross-section of the Exploits River combined with the cold temperatures in the region provide ideal conditions for frazil ice formation in the river during the winter months. The fast moving, relatively shallow turbulent water results in water being supercooled (i.e. the water is still in its liquid state but has a temperature below the freezing point). This water contains tiny ice crystals, termed frazil ice, which will adhere to structures such as trash racks at hydroelectric plant intake structures. Additional ice crystals will adhere to the initially deposited ice crystals, eventually resulting in partial or complete plugging of the trash racks.

Frazil ice can be controlled by slowing the velocity and aeration of the river water, thus encouraging an ice cover to form

on the water surface. Goodyear's Dam helps to reduce the velocities in this reach of the Exploits River by creating a pond upstream. This helps to encourage an ice sheet to form upstream of the dam. This ice sheet reduces the amount of frazil ice available in this section of the river. Based on current experience by NLH, there is potential for significant production loss to occur at the Grand Falls Generating Station due to frazil ice development around the facility's trash racks. This frazil ice would stick to the trash racks and freeze over the water intake, constricting flows to the powerhouse. Goodyear's Dam also retains water upstream of the dam. Businesses upstream of the structure have used this water for various purposes.

The Goodyear's Dam site consists of an earthen embankment dam, a central rockfill and timber crib spillway, an auxiliary rockfill over-spillway section, and fishways on the north and south (infilled) extents of the dam. The central timber-crib dam includes a concrete reinforced structure in the north part of the dam and in the south part of the dam a wood crib-only spillway structure (buttressed with riprap). The auxiliary (or "emergency") spillway is at the north end of the dam.

There is currently one functioning fishway at the dam site, located at the north side of the structure. A second fishway located at the south side of the dam was infilled during emergency repairs made to the structure in 2015.

Goodyear's Dam was originally built in 1911 and has undergone a number of modifications since its construction. A summary of key modifications to Goodyear's Dam is provided below.

2.1.2.1 Original Construction (1911)

During its original construction in 1911, the dam consisted of a concrete weir along the shallow northern section and a wood crib structure in the deep river channel section. These structures were constructed to an elevation of 67.4 m. A wood control structure was also constructed partially across the south gut, a 40-m section between an island and the south shore.

2.1.2.2 Dam Raising (1969)

In 1969, the dam underwent major reconstruction. The 1911 dam was raised to elevation 69.34 m on the north end and 69.8 m in the river channel by constructing a timber crib dam over the existing structure. Also located in this new wood dam was a notch for probable log driving. Earth fill dams were constructed across the south gut to an elevation of 72.7 and at the north abutment (elevation unknown).

2.1.2.3 Dam Repairs (1987 and 1988)

In 1987, repairs were conducted on the northern section of the spillway and in 1988 repairs were conducted on the southern section of the timber crib spillway. On the northern part of the dam, wooden timbers were replaced, and a concrete buttress was constructed on the downstream side of the spillway. Drawings indicate that both a south side and a north side fishway were in place prior to this repair work (1974 or earlier).

2.1.2.4 Auxiliary Spillway (2003)

In 2003, a rock armoured auxiliary spillway was constructed on the north end of the dam to provide additional emergency spill capacity following a flood earlier that year.

2.1.2.5 Spillway Emergency Repair (2015)

In 2015, an approximately 93 m long segment on the south side of the timber crib spillway was repaired, to refurbish a failed section, by constructing a rockfill, flow through/overtopping dam, buttressing and incorporating the post-failure remnants of the existing timber cribs. The refurbishment also included upgrading the access road to the south side of the spillway and constructing a laydown area.

2.1.3 Goodyear's Dam and Atlantic Salmon Migration

The Exploits River is a scheduled Atlantic salmon river and under natural conditions, it had limited Atlantic salmon habitat available because of the large natural waterfalls at Bishop's Falls and Grand Falls. As a result, less than ten percent of the entire watershed was accessible to anadromous (sea run) salmon due to the presence of these natural and the added industrial obstructions to upstream migration (ERMA http://www.exploitsriver.ca/history.php).

Enhancements to the river allowed returning adult salmon access to the habitat upriver of the natural and man-made barriers. The construction in 1958 of a hydroelectric facility on nearby Rattling Brook, a system near Exploits River within the Bay of Exploits, resulted in the blockage of this system to returning salmon. As a result, adult salmon returning to the tailrace of that facility after its completion were transferred to Great Rattling Brook, a tributary of the Exploits River. This required the construction of two new fishways; one on the main stem of the Exploits River at Bishop's Falls and another at Great Rattling Brook.

During the early 1970's, Fisheries and Oceans Canada (DFO) initiated a salmon stocking program on the Exploits River and stocked Atlantic salmon fry throughout the watershed. During the 1980's and 1990's, an incubation facility at Noel Paul's Brook was used for incubation of up to 10 million salmon eggs for enhancement purposes. The majority of salmon fry produced at this facility were distributed in the main stem and tributaries of the Exploits River below Exploits Dam at Millertown and later throughout the Lloyd's River watershed and tributaries above Exploits Dam. These enhancements, and other habitat improvements, have allowed the Exploits River Atlantic salmon run to increase from approximately 1,500 in the late 1970's up to runs of typically 25,000 in recent years (Atlantic Salmon Fence and Fishway Counts).

Returning adult salmon pass through a fishway operated by the Exploits River Management Association (ERMA) on the south side of the Exploits River at the Grand Falls Dam to migrate around this obstruction. Two concrete, pool-and-weir type fishways at the Goodyear's Dam site, one on the south side and one on the north side of the spillway, have allowed passage of migrating adult Atlantic salmon around this obstruction. The south fishway was made ineffective in 2015 as it was filled with rock during construction of the emergency repairs on the spillway.

All adult salmon passing through the ERMA fishway, estimated at 15,000 to 20,000 salmon, migrate primarily through the existing fishway at Goodyear's Dam on route to spawning areas in the main stem and tributaries upstream. Some fish passage may occur through the emergency repair section when water flow is high.

2.2 Project Purpose, Rationale and Need

NLH's foundation is built on its core business - the generation and transmission of electrical power – and the corporation has a strong commitment to providing safe, reliable and dependable electricity to its utility, industrial, residential and retail customers.

Goodyear's Dam is currently in poor condition. The rock-filled timber crib structure has deteriorated and will continue to degrade over time. Approximately one third of the length of the spillway (93 m) failed near the south abutment in 2015, and emergency repairs were successfully undertaken. While these repairs restored functionality, they were intended as a temporary measure and ongoing monitoring has identified continued movement and structural concerns.

A Dam Safety Review (DSR) was completed in 2023 and determined that the dam was at risk of further deterioration and potential failure. A subsequent options analysis recommended buttressing to address structural deficiencies. The current structure is not expected to provide reliable long-term service without significant intervention. The selected life extension approach will address immediate structural deficiencies, enhance fish passage, and extend the dam's service life by approximately 10 years.

The failure of Goodyear's Dam could have a myriad of potential effects including, but not limited to, an inability to operate the Grand Falls Generating Station during periods of the winter due to frazil ice and resultant forced outages, obstruction to salmon migration, loss of salmon habitat, economic loss to upstream businesses, and increased safety and environmental risks for the local community.

Risk mitigation measures, including monitoring of the dam and development of a recovery plan in the event of a failure, have been adopted by NLH to help reduce the likelihood and impact of failure of the dam. However, these measures alone are not sufficient to eliminate the risk. The proposed life extension works are necessary to ensure continued safe and reliable operation of the dam and the broader Exploits Generation system.

2.3 Alternatives to the Project

There are no practical alternatives to the proposed dam buttressing. The dam must remain in service to support the downstream power generating station operations. The issues of concern are the history of structural failure in 2015, aging wooden structures in poor condition, continuing erosion of the southmost section and the north section crest has damaged timbers and is misaligned. The use of precast concrete blocks for buttressing rather than coarse rocks was considered, but the complexity of the installation was considered less preferable due to increased uncertainty and higher cost.

The fish passage facilities have been subject to a design options analysis which considered multiple alternative designs and considered effectiveness of the existing dam and north fishway to provide fish passage (WSP 2025b). Based on that study, the currently proposed fishway design concept (vertical slot) was identified as the preferred option and was advanced for detailed design (WSP 2025c). The new fishway will be located on the south side of the dam, outside the existing river footprint. This location was selected primarily due to the south side's enhanced suitability for attracting fish and its lack of interference with the existing North Spillway's hydraulics. Additionally, vertical slot fishways require less extensive and costly bedrock excavation compared to other options and are easier to maintain. They are also equipped with protective metal grates, which help minimize human safety risk exposure.

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2.4 Project Components and Layout

The general arrangement of the proposed Goodyear's Dam Life Extension Project is based on staged rockfill buttressing of the existing dam structure and the construction of a new vertical slot fishway on the south side of the river. (Figure 2.3)

The Project, for the purposes of EA review, includes the construction of the following components:

1. Installation of additional rockfill buttressing along both the north and south sections of the existing timber crib overflow spillway.
2. Construction of a new vertical slot fishway on the southern abutment of Goodyear's Dam, which will include an auxiliary water supply system, reinforced concrete walls, and safety guards.
3. Following commissioning of the new south fishway, the deteriorated north fishway will be decommissioned and infilled.
4. Development and grading of new laydown areas which will be used for material storage, equipment staging, and contractor facilities.
5. Installation of temporary cofferdams upstream and downstream of the new fishway during construction to isolate work areas and minimize environmental impacts. Site preparation including site grading, berms, and drainage features.
6. Stockpiling of rockfill material on site for use in buttressing and site works. Riprap will be sourced from an offsite quarry.
7. Environmental protection and safety measures, including the implementation of sediment and erosion controls, site fencing, signage, and public/worker safety measures throughout construction.
8. The following sections provide a description of the Project's key components, based on previous and ongoing engineering studies and reflecting the current stage of Project planning and design. As described below, the Project is the subject of ongoing engineering, and as with any development project this will be subject to continued refinement and optimization as its planning and eventual implementation move forward.

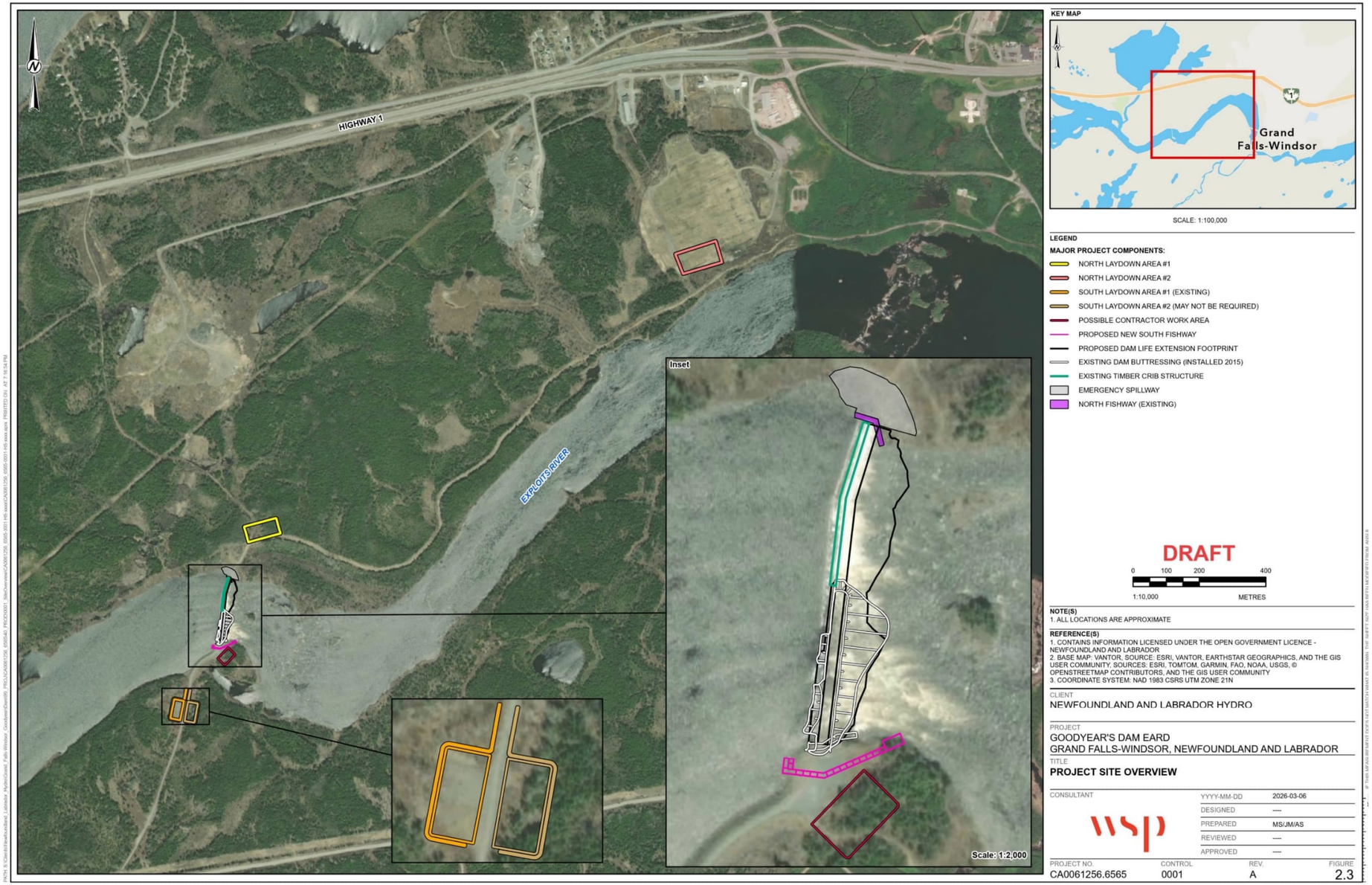


Figure 2-3 General Arrangement of Goodyear's Dam Life Extension Works

2.4.1 Rockfill Buttressing

The buttress works for the Project involve reinforcing both the south and north sides of the dam with large riprap (Figure 2.4) with a median diameter of 1.35 m to stabilize the dam structure (forming a stable 5H:1V downstream slope), raising the crest to the design elevation of 68.88 m (Figure 2.5). On the north side, additional riprap will be installed to create a buttress downstream of the existing timber crib structure, raised to an elevation of 69.3 m. The proposed design elevations are intended to approximate the original weir design from drawings dated 1988. Flow studies have been done, in consideration of climate change predictions, to ensure this design will meet present and future downstream ecological flow requirements to support fisheries, and to provide sufficient flow at the dam during migration (WSP 2025a).

The riprap will be carefully sized and placed to withstand hydraulic, ice, and seismic loads, with oversized rocks (2.0 m in diameter) used as necessary for reinforcing the buttress toe. Imported riprap will be washed at the source quarry, if needed, to minimize silt and sediment. The in-water work is scheduled outside Atlantic Salmon migration season, and the process is staged over two seasons to accommodate the construction schedule. This temporary buttressing is intended to provide a 10-year extension of the dam's operational life.

2.4.2 North Side Concrete Fishway

During a site visit on August 28, 2024, it was observed that the current condition of the north fishway is poor, with exposed rebar along the baffle walls, and that it would require repairs and continual maintenance to remain functional (WSP 2025c). The north fishway will no longer function after buttressing of the north side of the dam, so it will be abandoned in-situ, infilled, and buried. Returning the North fishway to functional condition has been rejected since the river thalweg is closer to the south side and the north fishway would be of relatively low value for fish passage but expensive to recapitalize.

2.4.3 South Side Concrete Fishway

A new vertical slot fishway will be constructed on the southern side of Goodyear's Dam to improve fish passage for Atlantic salmon. The planned layout of the new south side fishway is shown in Figure 2.6. The footprint differs from the existing infilled south fishway to minimize in-water work and environmental impacts. The design will include an auxiliary water supply system at the fishway entrance pool with stoplogs to provide sufficient attraction-flow. The construction involves blasting through bedrock for excavation, building reinforced concrete partition and side walls, and installing galvanized steel safety guards and the auxiliary water supply system. Cofferdams will be used upstream and downstream during construction to control water and minimize environmental impacts. The fishway is designed for a 75-year service life.

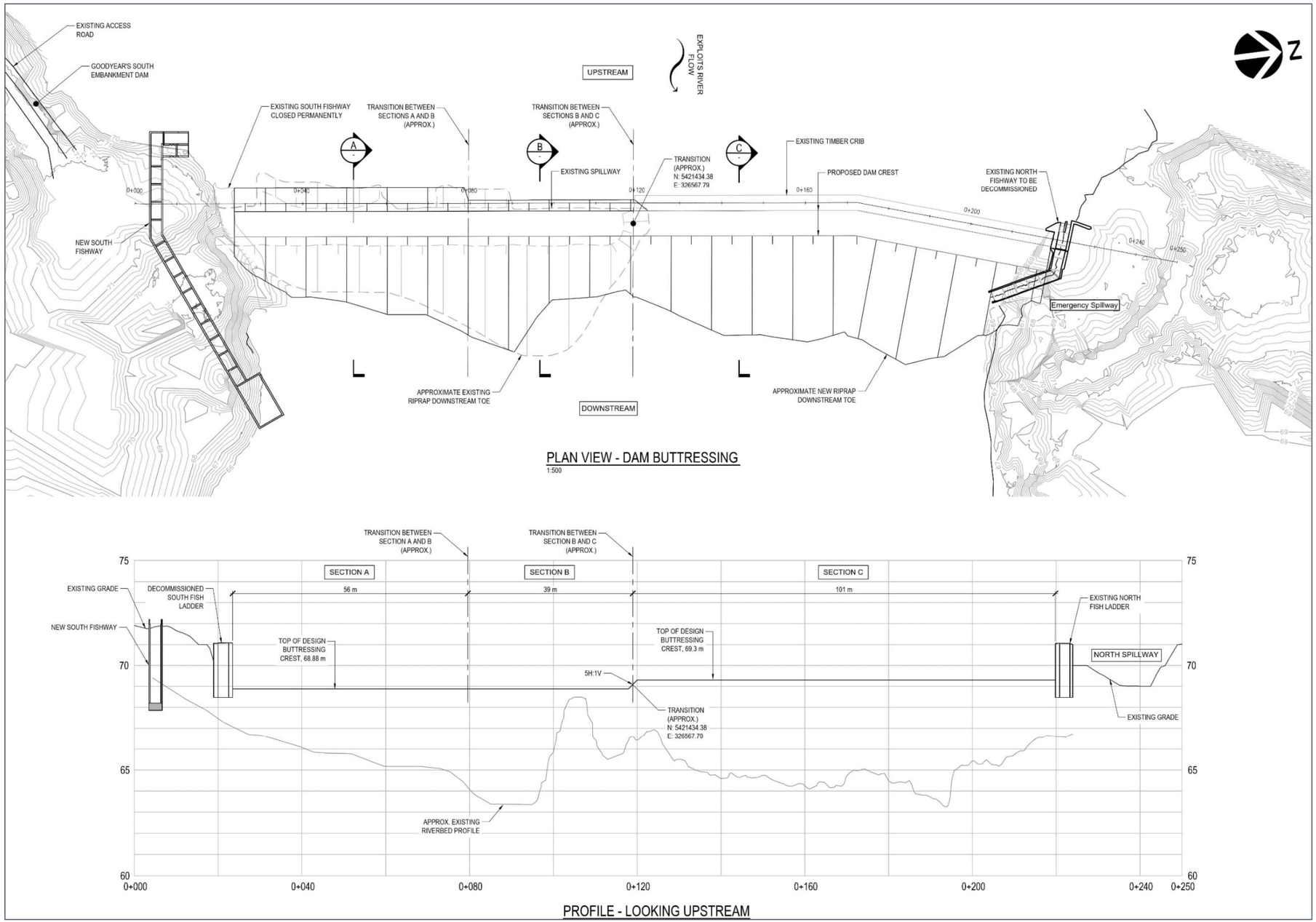


Figure 2-4 Planned Placement of Buttressing Material

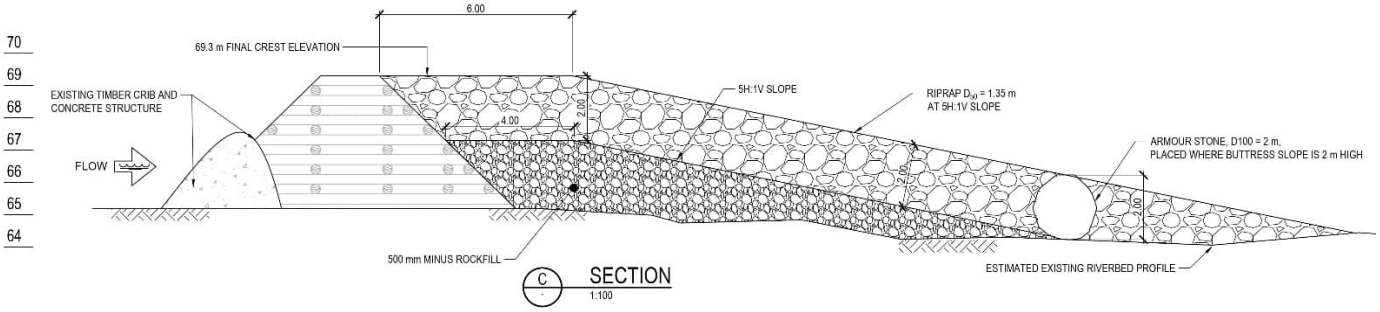


Figure 2-5 Typical Cross Section for Proposed Reinforcement

Figure 2-6 Layout of the New South Side Fishway

The fishway environmental design criteria included suitability for passage of Atlantic Salmon and the outlet (upstream exit) of the fishway be oriented perpendicular to the river flow to minimize debris accumulation in the exit pool. The design is based on review of historical flow data provided by NLH, and consideration for climate change and the recurrence of predicted drought episodes throughout the design life. A minimum flow volume at Goodyears Dam of 70 cm/s has been used which also matches the Exploits River flow upstream of the Sandy Brook confluence noted as of September 24, 2025, during a drought episode. A flow value of 70 cm/s equates to a water level of 69.4 m in the head pond with the new buttress; therefore, a design criterion of 69.2 m has been selected for the upstream invert elevation.

Due to the location of the proposed new fishway outside the existing river channel, blasting will be required as part of construction. Based on the existing dam construction, age, and stability, in the interest of dam safety a peak particle velocity of 50.0 mm/s is recommended (WSP 2025c). The DFO guidelines for blasting near fish habitat will also be considered when developing a blasting plan for the project.

2.5 Construction

A general overview of the primary activities that will be associated with the construction phase of the Project is provided in the following sections. The Project will be constructed with commonly used construction practices and in accordance with standard procedures and applicable regulatory requirements. The design of life extension modifications has considered hydrostatic pressure (upstream vs. downstream), uplift pressures, flood risk and frequency, ice loads, seismic loads, material sizing, dam stability, and water management (WSP 2025a).

2.5.1 Construction Phases and Sequencing

The current Project schedule will see planned Project construction activities completed in stages over a three-year period. The primary focus of construction in year one will be site preparation followed by construction of the new south vertical slot fishway, to ensure uninterrupted fish passage during subsequent works. In year two, decommissioning the deteriorated north fishway will take place and rockfill buttressing along the north section of the dam. Year three will consist of completing rockfill buttressing on the south section. The planned construction sequence for each year is as follows:

- Year One: Site preparation & southside fishway construction
  - Prepare laydown areas for temporary stockpile of approximately 15,000 m^3 of rockfill material for use in buttressing and site works.
  - Develop and grade new laydown areas for material storage and equipment staging.
  - Install temporary cofferdams upstream and downstream of the new fishway to isolate work areas and minimize environmental impacts.
  - Construct the new vertical slot fishway (mostly though blasting) on the south abutment of Goodyear's Dam, including installation of an auxiliary water supply system, reinforced concrete walls, and safety guards.
  - Remove temporary cofferdams at fishway entrance/exit and complete any site restoration.
- Year Two: Northern buttressing and north fishway decommissioning

- Lower the headwater elevation to reduce or eliminate the amount of spillage over the top of the timber dam (north section). This will require excavating a section of existing riprap materials near the south abutment (Figure 2.7) and storing water (when possible) upstream of the dam. The excavation of the section will be completed from the south abutment using a long-reach excavator.
- To allow construction access downstream of the structure, a raised temporary access road will be positioned slightly downstream of the final crest (Figure 2.8). The berm will be constructed using the 300 mm minus rockfill core material and will be 6.0 m wide. It is noted that the contractor may extend or widen this berm downstream to allow for equipment turnaround or to have an excavator and truck/loader on the dam at the same time. It is intended that only equipment (excavator / loader) used to place the material will be permitted to travel over the access road. A geo-fabric may be placed under the access road berm, if needed, to minimize silt and sediment and to aid in removal post construction. Upon completion of this section, the driving surface will be removed.
- Decommission and infill the deteriorated north fishway following commissioning of the new south fishway. Due to the lowering of the headwater elevation, seepage over the timber dam should be reduced or eliminated (no overflowing water).
- Construct the buttressing along the timber structure, allowing for more effective placement of the armour and core materials. This will proceed until reaching the crest elevation.

- Year Three: Southern buttressing and project competition
  - Rockfill buttressing/ repair on south end of structure.

Specific construction approaches and methodologies will be determined and proposed by the Contractor(s) that is eventually retained by NLH to complete this work. However, any and all construction techniques and activities will be in full compliance with applicable environmental legislation, regulations and authorizations (EA and permitting) and in accordance with relevant NLH policies, the project specific environmental protection plan and other requirements.

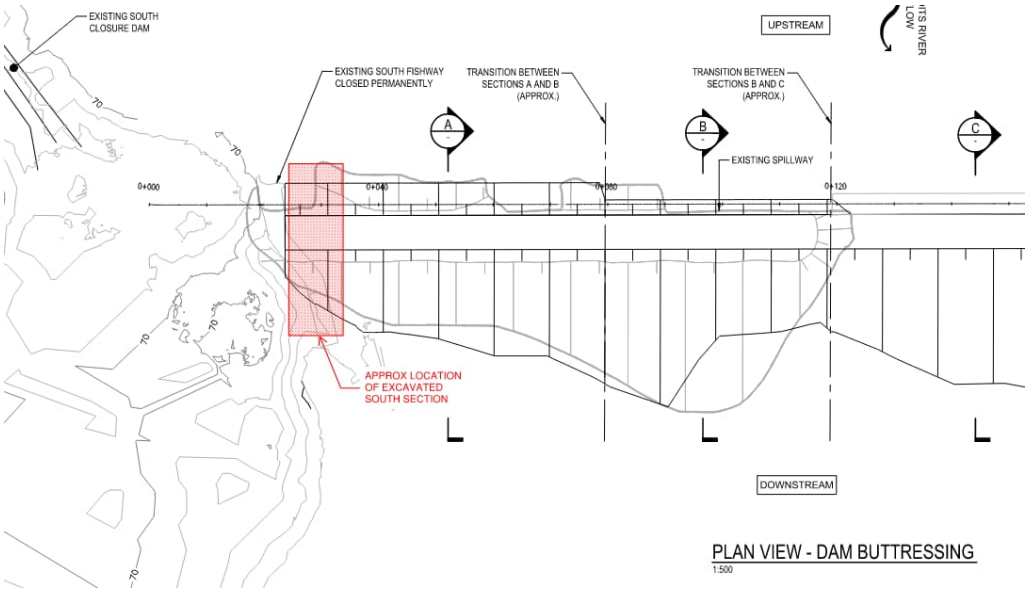


Figure 2-7 Approximate Location of South Excavated Section

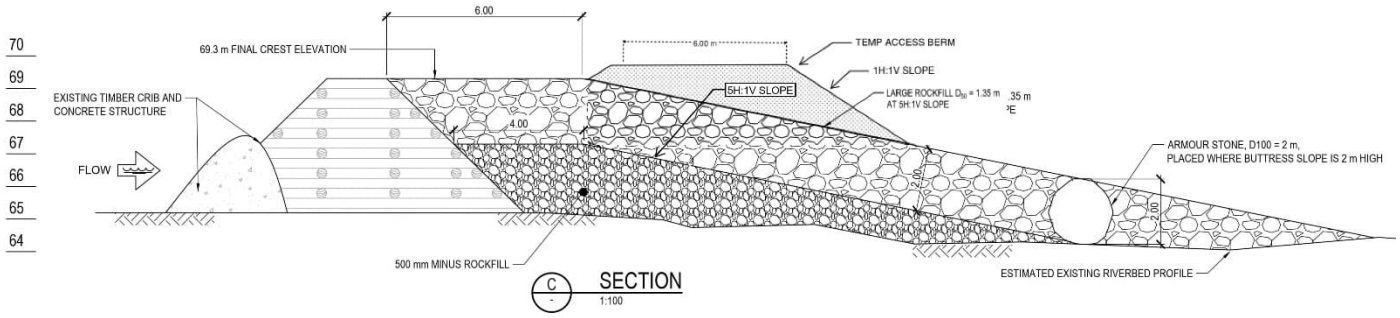


Figure 2-8 Temporary Access Berm on Cross Section through North End of Spillway

2.5.2 Construction Related Infrastructure

Some construction related infrastructure, such as access roads and material storage yards, are available at Goodyear's Dam because of the on-going operational and past construction requirements associated with the existing dam. However, these may require modifications related to the increased intensity of vehicle activity, and material and equipment volumes, associated with project construction. Other construction related infrastructure such as construction power may require temporary infrastructure to be put in place on-site for periods during the 3-year construction schedule. As the size of the workforce associated with construction is limited, and the work site is close to existing communities, no worker accommodations are required on site.

Not all construction related infrastructure requirements can be fully defined at this stage in the Project planning. The following section provides information associated with construction infrastructure available at this time.

2.5.2.1 Access

Access to Goodyear's Dam is available by existing gravel road networks on both the north and south side of the river. Access to these gravel roads is available from the TransCanada Highway through the community of Grand Falls-Windsor.

The south side access road was used for the emergency repair work that was undertaken in 2015 and is proposed to be used for access to the south side of the construction area for this Project. The south side access road is suitable for use for construction in its present condition.

The north side access road is used by NLH's operational personnel for access to Goodyear's Dam for regular maintenance. This gravel road is proposed to be used for access to the north side of the construction area for this Project, following resurfacing upgrades that will be completed prior to work at the dam.

2.5.2.2 Laydown Areas

Suitable cleared and leveled areas are required near the construction site, on both the north side and south side of the river, for storage of materials and equipment to be used in construction. The laydown areas are shown in Figure 2.3. The areas will also be used to accommodate construction, office trailer(s), lunch trailer(s), and suitable washroom facilities, as required. Mobile diesel generation may also be provided on these sites to provide construction power, if required. The South Laydown Area #1 on the south side of the river was previously used for the same purpose during the 2015 dam modifications (Figure 2.3). It is possible that an additional South Laydown Area #2 may be required immediately south of South Laydown Area #1 (Figure 2.9) and a possible Contractor Work Area may be developed just west of the proposed new fishway (Figure 2.3). On the north side of the river, the main site to be used is North Laydown Area #1 adjacent to the access road near the north end of the dam (Figure 2.10). Approximately 1750 m2 will be used for each laydown area.

An additional North Laydown Area #2 is required on the north side for rockfill and riprap stockpiling. Due to the limited space near the north dam abutment, a "primary" material laydown and stockpile area has been identified, located 3 km northeast from the site about 1.0 km from the Trans-Canada Highway and is accessible by paved road, allowing highway-related trucks to efficiently deliver materials. This area measures approximately 8100 m2. Fill materials will then be transported to the dam site over a 2.7 km access road.

This configuration ensures efficient material handling and site logistics while accommodating the scale and sequencing of the current rehabilitation works.

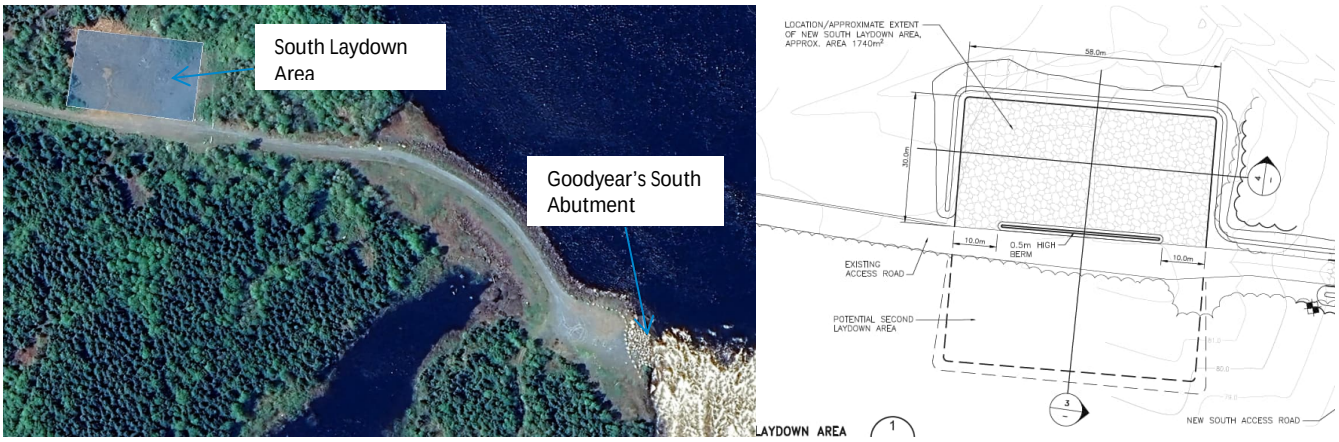


Figure 2-9 Proposed Location of South Side Laydown Area

Figure 2-10 Proposed Location of North Side Laydown Area

2.5.3 Construction Workforce

Project construction will be carried out on a contractual basis, with workers hired at the discretion of the Contractor and in accordance with its own hiring practices and policies. Once construction is completed, the facility will continue to be operated using NLH's existing workforce. NLH supports employment and gender equity in its hiring and contracting practices.

An initial estimate of the Project's required construction labor force, by number, occupation and National Occupational Classification (NOC) code, is provided in Table 2.1.

Table 2.1 Occupations Likely to be Represented in the Construction Work Force

Project Phase	Number (Approximate)	Occupation	National Occupational Classification (NOC)
Construction	1	Supervisor/Foreperson	NOC 7205
	5	Heavy Equipment Operators	NOC 7521
	1	Crane Operator	NOC 7371
	5	Concrete Finishers	NOC 7282
	5	Steel Erectors	NOC 7235
	3	Drillers	NOC 7372
	10	Truck Drivers	NOC 7511
	10	Labourers	NOC 7611
	1	Environmental Monitor	NOC 2231

2.6 Operation and Maintenance

Once construction is completed, the above-described changes to Goodyear's Dam will continue to be operated as per NLH's current operating practices and processes for the facility. Project maintenance activities will include regular inspection and on-going repair and maintenance of the facility as required.

2.7 Project Schedule

Following detailed and on-going engineering design and planning, the current Project schedule would see the initial phase of construction activity beginning in spring 2026 (Year 1) and concluding that year with the onset of winter conditions. Year 2 and Year 3 of construction will commence approximately mid-June and conclude in late 2028 (having paused over the winter of 2027/28). Project sanction, initiation and scheduling is, however, subject to final Project

planning and engineering activities, and the receipt of all required corporate and regulatory approvals to proceed. Flood Frequency Analysis (FFA) shows that, for the period of October to November, the 2-year flood events are 30% lower than those observed during October to March and 47% lower than those expected during October to April. This timeline minimizes interaction with snow and river ice and could significantly reduce the likelihood of potentially severe floods (WSP 2025a).

2.8 Project Documents

In addition to this EA Registration, NLH also contracted completion of a Stage 1 Historic Resource Assessment of the Project area under guidelines established by the PAO (titled *Stage 1 Historic Resources Assessment Goodyear's Dam Replacement Project Exploits River Newfoundland and Labrador*, December 5, 2017).

The following project documents were also reviewed in preparation for this EA:

- WSP Canada Inc. (2025a). *Goodyear's Dam Temporary Rehabilitation Project: 85% Progress – Final Design Report.* Prepared for Newfoundland and Labrador Hydro.
- WSP Canada Inc. (2025b). *Goodyear's Dam Fishway Design Options Study: Final Report REV 1.* Prepared for Newfoundland and Labrador Hydro.
- WSP Canada Inc. (2025c). *Fishway Design Criteria Memo: Goodyear's Dam Rehabilitation Project.* Prepared for Newfoundland and Labrador Hydro.

2.9 Environmental Management and Protection

The number and diversity of environmental challenges facing large companies and their development projects and operations require a structured and consistent management approach. NLH has chosen the ISO 14001 Environmental Management System (EMS) standard developed by the International Organization for Standardization (ISO) to manage environmental aspects. This decision has resulted in continual improvement of environmental performance, while fulfilling the corporation's mandate to provide customers with cost-effective and reliable power. NLH's EMS has been registered by an external auditor (QMI-SAI Global) as compliant with the ISO 14001 standard. NLH's EMS applies to Exploits Generation operations and this Project will be undertaken in accordance with the applicable policies and procedures of that EMS.

2.9.1 Environmental Protection Planning

Environmental protection planning is an integral part of NLH's construction, operations and maintenance programs.

As noted previously, NLH currently operates an extensive electricity generation and transmission system in Newfoundland and Labrador. This includes interconnected electrical power systems in Labrador and on the Island as well as isolated distribution systems throughout rural areas of the province. As a corporation with significant experience in constructing and maintaining hydroelectric and other generation facilities and transmission infrastructure in Newfoundland and Labrador, NLH has state-of-the-art and proven policies and procedures related to environmental protection and management which will be implemented during the various phases of this proposed Project.

An Environmental Protection Plan (EPP) is an important tool for consolidating environmental information in a format that provides sufficient detail for the implementation of environmental protection measures in the field during construction. An EPP provides concise instructions to personnel regarding protection procedures and descriptions of techniques to reduce potential environmental effects associated with any construction activity. The main objectives are to:

- Consolidate information for planning;
- Ensure that environmental standards are current and complied with;
- Provide details of corporate commitments to environmental protection and planning; and
- Provide guidelines for field activities and decision-making on environmental issues relevant to construction, operations and maintenance activities.

Depending on construction sequencing, one or several activity-specific EPPs will be prepared and implemented by the selected Contractor(s) for the Project's construction phase. Each EPP will be a field-useable document, addressing provisions that will avoid or reduce environmental effects which may be associated with construction. As appropriate, each EPP will include items relating to work in or near water, contingency plans for unplanned events such as spills, rehabilitation and compliance monitoring, and others.

A preliminary EPP has been drafted for planned activities and phases (WSP 2026).

2.9.2 Health & Safety and Environmental Emergency Response Plans

In the construction, operation and maintenance of any development project, an accidental release or other unplanned event is an unlikely, but unfortunately possible, event. NLH proactively identifies potential emergency situations and develops response procedures, including Health & Safety, and Environmental Emergency Response Plans.

The purpose of these plans is to identify responsibilities in the event of an unplanned incident, including the accidental release of fuel or other hazardous material, on-site or during transportation, and to provide the information required for the effective response and reporting of such an incident. NLH will conform to both provincial and federal legislation with the intent of meeting both its legal and corporate responsibilities.

The establishment and maintenance of emergency response procedures address the:

- Protection and maintenance of human health and safety;

- Identification of the potential for accidents and emergency situations;
- Planned response to accidents and emergency situations; and
- Prevention and mitigation of potential environmental effects associated with accidents and emergency situations.

Depending on construction planning and sequencing, one or several site/activity-specific plans will be prepared and implemented for the Project. The Project-specific plans will address: roles and responsibilities, personal protective equipment, materials storage, driving safety, working at heights, confined spaces (e.g., trench), working near or over water, emergency response communications, spill response, personnel injury response, search and rescue, fire response, and vehicle / equipment accidents.

2.10 Environmental Permits and Approvals

The Project will require a range of environmental permits and other authorizations (Appendix A). The post-EA permitting process will provide the opportunity for relevant government departments and agencies to receive and review additional Project design information, and to establish specific terms and conditions to avoid or reduce environmental effects. NLH is committed to obtaining, and complying with the conditions of, these required permits and approvals during Project construction and operation and will require the same of all contractors that are involved in this Project.

NLH and/or its contractors will identify, apply for and adhere to all required permits and other authorizations that are required for Project construction and/or operations.

3. Consultation

Consultation is an important and integral component of the EA process and is a key aspect of NLH's approach to project planning and development. The Newfoundland and Labrador EA process provides considerable opportunity for interested parties to bring forward their views and to identify issues and ask questions about a Project for consideration in its review and in eventual decision-making. This includes consultation by the proponent and by government at various stages of the EA review process.

To date, introductory meetings have been held with Fisheries and Oceans Canada (DFO), NL Department of Environment, Conservation and Climate Change (NLECCC) Water Resources Management Division and with the Town of Grand Falls-Windsor to present an overview of the project scope. The introductory slide deck presentations and meeting minutes are included in Appendix B.

3.1 Public Open House

As part of its on-going Project planning and the associated preparation of this EA Registration document, NLH conducted a public meeting in Grand Falls – Windsor to provide information on the Project and to identify any associated questions or concerns that local residents and other interested members of the general public may have regarding the Project.

This consultation initiative took the form of a Public Open House and was held at Mount Peyton Resort and Conference Centre in Grand Falls – Windsor on February 11, 2026. This public open house was advertised through the NLH website (Public Advisory: Open House Scheduled for Goodyear's Dam Life Extension Project – Newfoundland & Labrador Hydro) that provided details on the purpose, location and timing of the open house, as well as through other means as follows:

- Letters of invitation were emailed to nearby towns, and to various local businesses and groups; and
- A notification was emailed to the Grand Falls – Windsor Town Council for posting in the Town Office and on its website, as well as to several local businesses (hotel and retail establishments) for posting within their public areas.

Upon arrival, participants were greeted by a Project Team representative at a sign-in table, who provided an overview of the open-house purpose and format. The session included information stations arranged throughout the open-house venue, consisting of tables with large information panels that focused on the following themes:

1. An overview of NLH in general and Exploits Generation in particular;
2. A description of the existing Grand Falls Hydroelectric Generation Station;
3. A description of the existing fish conveyance systems and water management at Goodyear's Dam;
4. A description of the proposed Project (primary components and planned construction / operations activities);
5. An overview of some Project-related environmental considerations and planned mitigation, and of the Newfoundland and Labrador EA process.

The purpose of the information panels was be to provide general background information, and to serve as a basis for prompting dialogue and the sharing of information and input by consultation participants.

A key focus was to obtain and record information and input related to:

- Questions, issues or concerns regarding Project and its potential environmental or socioeconomic effects;
- Local knowledge regarding the existing biophysical or socioeconomic environment in or near the Project Area; and
- Suggestions for any mitigation measures or other means through which any identified issues could be addressed in future Project planning and decisions / actions.

3.2 Overview of Consultation Findings

The primary topics and themes identified during the consultation activities included:

- Construction material source, including whether material will be from an existing licensed quarry (or a new quarry) and if material shall be washed as appropriate;
- Employment opportunities, including number of direct and indirect jobs in the local community and how local contractors may apply to provide services;
- Project schedule, including construction timing relative to sensitive seasons for Atlantic salmon and migratory birds and the overall duration of project activities;
- Water levels, including changes in the reservoir and maintenance flow to the downstream aquatic environment; and
- Fish passage, including how passage for fish species will be maintained during and after construction and the design of the proposed new fishway.

The governmental and public review of this EA Registration will help to identify any important environmental questions and issues related to the proposed Project, for consideration by government in determining whether further EA review is required, and/or any terms and conditions that may be associated with EA approval.

4. Environmental Assessment Methodology

This Section provides the approach to assessment of potential environmental impacts used in this study.

4.1 Scope and Focus

An EA requires an initial scoping exercise to define the key components and activities of the proposed project that is being assessed, as well as to establish the spatial and temporal boundaries for the assessment and identify the primary environmental components and issues to be considered. The scope of an EA should be established early in the process to ensure that the analysis remains focused, manageable and meaningful.

4.2 Project Interactions and Valued Components

A comprehensive overview of the Project, including each of its associated components and activities, was included in Section 2 – Project Description. The key aspects of the Project that were considered relevant for evaluation of the potential environmental and social effects on the environment included the following:

Construction

- Transportation/use of equipment and materials;
- Site preparation (i.e., clearing, stockpiles);
- Construction (including blasting) of new south fishway channel;
- Construction of discharge channel in south side of structure for water management;
- Installation of temporary access road downstream of the structure; and
- Placement of buttressing material on the downstream side of the north dam (2027) and south dam (2028).

Operations and Maintenance

- Operation of dam (life extension upgrade works) (~10 years);
- Monitoring dam integrity and fish passage effectiveness; and
- infrastructure maintenance as needed.

Potential Accidental Events

- Infrastructure malfunctions;
- Spills; and
- Wildfire.

Their potential interactions were considered to be:

- Air Quality: changes in GHGs, dust, light, noise and vibrations associated with the use of on-site equipment, installation of infrastructure and other activities during construction and operations, and the potential for these changes in air emissions to affect fish, wildlife, and people.
- Terrestrial Habitat: potential effects due to clearing and excavation, and other construction and operations activities.
- Aquatic Habitat: changes in surface water conditions (quantity, distributions, flows) and quality due to Project components and activities, including associated water use and management.
- Socio-economic Environment: potential alteration or destruction of historic resources as a result of accidental discovery during excavating activity and other ground disturbance (if they are present), and potential creation of Project-related employment and business opportunities, and associated economic effects at the local, regional and provincial scales.

An EA focuses on components of the environment that are of ecological and/or social importance, and which have the potential to be materially affected (either adversely or positively) by the proposed project. These may include both biophysical and socioeconomic aspects of the environment.

Based on potential interactions, the environmental effects assessment is focused on the following Valued Components (VC):

1. Atmospheric Environment;
2. Terrestrial Environment;
3. Aquatic Environment; and
4. Socioeconomic Environment.

4.3 Study Areas

EA study areas have been established to focus the environmental effects assessment. The Project's potential environmental effects are assessed, and their significance is evaluated within the below described spatial and temporal boundaries.

1. Spatial Boundaries: Two types of spatial boundaries have been identified and considered in conducting the environmental effects assessment:

- Project Area: which is an area that encompasses the planned Project components and activities (Section 2) and represents the "footprint" of the development as defined at the current stage of Project planning and design (Figure 2-3).

- Study Area: which encompasses the Project Area identified above and extends beyond it to include the possible zone of influence of any Project-related emissions and other disturbances and their potential environmental effects. For the purposes of the EA, this area has been conservatively set at approximately 2 km upstream from Goodyears Dam, and approximately 4 km downstream, at the hydroelectric generating station in Grand Falls.

2. Temporal Boundaries: In all cases, the temporal boundaries include the planned timing of Project phases and activities, as well as the likely duration of any resulting environmental effects. In conducting the effects assessment, consideration is also given to the relevant temporal characteristics of the environmental components under consideration, including the timing of their presence within the Project and Study Areas, any particularly sensitive or critical periods, likely response and recovery times to potential effects, and any known and applicable natural variation in that environmental component.

4.4 Environmental Assessment Methodology

Environmental planning, management and mitigation measures are considered in a fully integrated manner in the environmental effects assessments that are presented in this Section.

4.4.1 Environmental Effects Assessment Descriptors

This section provides an analysis (prediction) and description of the likely environmental effects of the Project on the environmental component. The environmental effects assessment considers the nature, degree, extent and timing of potential Project-induced change from the existing (baseline) environment (as described in Section 5.1).

Within this section, potential environmental effects are assessed and evaluated for both planned Project components and activities, as well as for any potential accidental events that may occur because of the Project. The environmental effects assessment for each component is presented for each Project phase, each of which is addressed in a separate subsection as follows:

1. Construction;

2. Operations and Maintenance; and

3. Potential Accidental Events.

Environmental effects management (including mitigation) measures are considered in a fully integrated manner in the effects assessment, which is therefore focused upon identifying and describing the likely residual environmental effects of the Project. The current condition of an environmental component because of natural and/or anthropogenic factors, and thus, its resulting resiliency or sensitivity to further change (ecological/socioeconomic context) was also considered as part of the assessment and evaluation of environmental effects.

These predicted (residual) effects of the Project are described based on several standard and widely accepted environmental effects criteria or “descriptors”, as listed and defined in Table 4-1.

Table 4.1 Environmental Effects Descriptors and Associated Ratings

Effects Descriptor	Definition and Ratings
Magnitude	The degree of change from existing (baseline) conditions ■ Negligible: Although there is potential for interaction, there would be no likely detectable effect that would differ from current conditions or be outside natural variability. For the Atmospheric Environment: ■ Low: A minor, but detectable change to existing conditions, but one that is within the range of normal variability, or which does not change overall availability or quality of the environmental component or parameter; ■ Medium: A detectable change to existing conditions, but one that is within applicable regulatory standards and guidelines, or which does not change overall availability or quality of the environmental component or parameter; and ■ High: A detectable change to existing conditions that results in measurable and prolonged exceedances of applicable regulatory standards and guidelines or changes in overall availability or quality of the environmental component or parameter. For the Terrestrial and Aquatic Environments: ■ Low: Materially affects 0 to 10 percent of the population that occurs in the Study Area; ■ Medium: Materially affects 10 to 25 percent of the population that occurs in the Study Area; and ■ High: Materially affects over 25 percent of the population that occurs in the Study Area. For the Socioeconomic Environment: ■ Low: Affects 0 to 5 percent of individuals/users in the Study Area or is otherwise detectable, but does not change overall availability, quality or value of the environmental component or parameter; ■ Medium: Affects 5 to 25 percent of individuals/users in the Study Area or is otherwise detectable, but is within applicable regulatory standards and guidelines and/or does not change overall availability, quality or value of the environmental component or parameter; and

Effects Descriptor	Definition and Ratings
	■ High: Affects over 25 percent of individuals/users in the Study Area or is otherwise detectable, and results in measurable and prolonged exceedances of applicable regulatory standards and guidelines and/or changes the overall availability, quality or value of the environmental component or parameter.
Geographic Extent	The spatial area within which an effect will likely occur and be detectable: ■ Site: Effect is confined to the Project Area or a portion thereof; ■ Local: Effect is confined to the Study Area or a portion thereof; and ■ Regional: Effect will likely extend beyond the Study Area.
Duration	■ The period over which an environmental effect will likely occur and be evident (in months).
Frequency	How often will an environmental effect occur? ■ Once: Occurs once during the Project; ■ Sporadic: Occurs sporadically during the Project; ■ Regular: Occurs on a regular basis throughout the Project; and ■ Continuous: Occurs repeatedly and continuously throughout the Project.
Reversibility	The likely ability of an environmental component to return to an equal or improved condition once the disturbance(s) has ended.
Certainty	The level of confidence in the environmental effect prediction.

4.4.2 Criteria for Evaluation of Significance

Evaluating the significance of the predicted environmental effects of a proposed project is one of the most important steps in any EA. This typically involves: 1) defining what a significant environmental effect is, and based on that definition, 2) evaluating whether a project's potential environmental effects are significant or not significant. Significant environmental effects are those adverse effects that will cause a change in in an environmental component that will alter its status or integrity beyond an acceptable and sustainable level. An environmental effect that does not meet these criteria is considered not significant.

For the purposes of this EA, significant environmental effects are defined as those that are likely to cause one or more of the outcomes outlined in Table 4-2. For the environmental effects assessments that follows, these criteria and definitions are used to describe and evaluate the significance of both Project-specific as well as cumulative effects.

Table 4.2 Environmental Effects Significance Criteria

Component	Definitions
Atmospheric	■ A detectable decrease in existing air quality conditions (availability, quality) that results in measurable, repeated and prolonged exceedances of applicable regulatory standards and guidelines, and/or associated, detectable and sustained changes in local air quality; ■ A detectable increase in noise (sound pressure levels) and vibration conditions that results in measurable, repeated and prolonged exceedances of applicable standards and guidelines at nearby residential areas or other sensitive points of reception, and/or which otherwise causes detectable and prolonged disturbance effects; or
Terrestrial and Aquatic	■ Mortality or life-threatening injury to one or more individuals of a designated (protected) species at risk, or destruction or alteration of the critical habitat of any such species. ■ Effects to any species within the Study Area, such that size, health, ecological function or sustainability of a population would be measurably and adversely affected; or ■ Destruction of, or displacement of aquatic biota from, important feeding or reproduction areas, migratory routes or other essential habitats, during time periods and for durations over which the size, health, ecological function and/or sustainability of a population would be measurably and adversely affected.
Socioeconomic	■ An adverse effect on the health, safety or well-being of affected individuals or communities, such that there are associated, detectable and sustained decreases in these characteristics and the resulting health or quality of life of a population. ■ A detectable reduction in commercial activity levels and overall economic revenues over several years for one or more existing and active enterprises, which challenges their on-going operations and overall economic viability; or ■ A decrease in overall recreational / traditional activity levels or the enjoyment or cultural value of these pursuits for a community or region over multiple seasons or years.

4.4.3 Cumulative Effects Assessment

The cumulative effects assessment evaluates potential impacts that might result from the Project in combination with other projects or activities that have been or will be carried out. The cumulative effects assessment considers the overall (total) effect on the environmental component as a result of the Project's likely residual environmental effects (as summarized above) and those of other relevant projects and activities, using the following approach:

1. Past and on-going projects and activities and their effects are reflected in the existing (baseline) environmental conditions (Section 5.1). The current condition of the environmental component as a result of these natural or anthropogenic factors, and thus its overall sensitivity or resiliency to further disturbance or change, has been considered throughout the environmental effects assessment.

2. The cumulative effects assessment considers whether and how this existing condition could be changed by the introduction of the Project and its residual (with mitigation) environmental effects.

3. Other likely future projects and activities that are relevant to this environmental component and its cumulative effects assessment are then identified and considered. These comprise any reasonably foreseeable future projects or activities whose effects on the component would likely overlap or otherwise accumulate in space and time with those of the Project (e.g., overlapping with the Project area or its zone of influence, or affecting the same populations/communities as the Project).

4. In any cases where the predicted residual environmental effects of the Project on the component will likely accumulate or interact with those of one or more other future projects and activities, the potential cumulative effects of the Project in combination with those of these other relevant future developments are assessed and evaluated (using the same significance definition and approach as was used for the Project-specific effects assessment, as described above).

5. Environmental Setting, Potential Interactions and Mitigation

This Section provides an overview of the existing environmental setting for the proposed Project, including a description of relevant components of the biophysical and socioeconomic environments. This is followed by an analysis of the Project's potential environmental interactions and the identification and description of mitigation measures which will be put in place to avoid or reduce any such effects.

5.1 Existing Environment

The following sections provide a general description of the existing natural and human environments in the area within which the Project will be located, based on existing and available information. The objective is to present an overview summary of the environmental setting and context for the Project.

5.1.1 Biophysical Environment

The proposed Project site is located in Central Newfoundland, on the Exploits River to the southwest of the Town of Grand Falls – Windsor.

The climate of Grand Falls-Windsor is typical of the larger region, which has the most continental climate of any part of insular Newfoundland including the highest summer and lowest winter temperatures in the area. A summary of the key climatic characteristics of the Grand Falls-Windsor area is presented in Table 5.1, based on 30-year climate normals data for mean temperature at the nearest currently functioning weather station at Badger for the years 1991 to 2020 and precipitation data from 1981-2010. The Grand Falls-Windsor station is now inoperative.

Table 5.1 Climate Normals for Badger (1991-2020) and Grand Falls-Windsor(1981-2010)

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Mean Temperature (oC)	-8	-8.5	-5.2	1.2	6.7	11.9	16.9	16	11.2	6	1.1	-3.6	3.8
Precipitation (mm)*	94	94	91	84	79	89	89	107	96	94	94	90	1,099
Rainfall (mm)*	32	30	37	53	74	89	89	107	96	90	73	37	806
Snowfall (cm)*	62	64	54	31	5	0	0	0	0	4	21	53	293

Source: Environment and Climate Change Canada (2026)

*Precipitation, rainfall, and snowfall data for Badger was incomplete, so slightly older data for Grand Falls-Windsor (1981-2010) was used. The Grand Falls-Windsor weather station is no longer operating.

Overall, the mean monthly temperature at this location is 3.8 ° C, and ranges from -8.5 ° C in February to 16.9 ° C in July.

The Grand Falls-Windsor area also receives fairly consistent precipitation throughout the year, averaging 1,099 mm annually. May is generally the driest month with 79 mm of precipitation, while August is the wettest on average with 107 mm. The total annual snowfall is 293 cm each year, generally occurring between October and May.

The NL Department of Environment Conservation and Climate Change, in conjunction with the Department of Environment and Climate Change Canada (ECCC), maintain a National Air Pollution Surveillance (NAPS) monitoring station adjacent to the former Abitibi mill site. The station measures concentrations of various air pollutants including particulate matter, ozone, nitric oxide, nitrogen dioxide, other oxides of nitrogen, carbon monoxide and sulfur dioxide. ECCC's website for NAPS data indicates that average recorded concentrations of fine particulate matter and nitrogen dioxide at this monitoring station in 2014, the last year for which data is presently provided, were below the national average. The average recorded concentration for ozone was 35 parts per billion, which is slightly above the national average of 32.9 parts per billion. The recorded concentrations were less than the national air quality standards for all three parameters (ECCC, 2026).

The underlying bedrock of the Grand Falls area is characterized primarily by the lower Silurian, Wigwam Formation (Rogers and van Staal 2005), and is comprised predominantly of sandstone, siltstone and conglomerate. Surficial geology within and around the Project area is primarily of fluvial origin, and consists of clays and silt deposited by the Exploits River. Surficial formations within the area are dominantly bedrock outcroppings and bog (Taylor et al 1994; Batterson 1999). Within the immediate Project site, bedrock outcroppings are the primary surficial feature, as the majority of overburden has been eroded by the Exploits River.

The Project area is located within the Central Newfoundland Ecoregion (Meades 1990; NLDECCC 2026), which encompasses much of the north-central portion of the Island of Newfoundland. This ecoregion is again characterized by a continental climate with relatively high summer temperatures and low winter temperatures. Due to the warm summer and high evapo-transpiration losses, soils in the northern part of this ecoregion display soil moisture deficiency. The hylocomium-balsam fir forest type occupies the zonal soils of this area. These soils are generally lighter in colour and have lower organic matter content compared to other ecoregions. Forest fires have played an important role in the natural history of this region, and much of the balsam fir-feathermoss forest types have been converted to black spruce and some of the richer site types to hardwood forests dominated by white birch and aspen. Although aspen occurs in other regions, it is most abundant and vigorous in Central Newfoundland, but yellow birch is absent from this region primarily because of the short frost-free period. Alders rather than mountain maple are the most common species on wet seepage slopes.

Within the larger Central Newfoundland Ecoregion, the Northcentral Subregion encompasses the proposed Project area itself. This area has higher summer maximum temperatures, lower rainfall and higher fire frequency than anywhere else in Newfoundland, and for the most part exhibits a rolling topography below 200 m. The rolling to undulating topography is characterized by shallow, medium quality till with a soil texture range from sandy loam to loam. Pure black spruce forests and aspen stands dominate this area because of the prevalence of fire in the natural history of the subregion. Where tree regeneration is lacking, succession to dwarf shrub heath dominated by Kalmia angustifolia occurs on the nutrient-poor coarse textured till that is prevalent through much of this area (Meades 1990; NLDECCC 2026). The proposed Project site itself is primarily cleared ground interspersed with pockets of black spruce and shrubs.

The Central Newfoundland region, with its productive and scrub forests, extensive wetlands and barren areas also provides habitats for a range of wildlife that are typical of boreal forest ecosystems. Wildlife species that are known or likely to occur in the general region include large mammals (moose and black bear), furbearers and small mammals (such as fox, hare, red squirrel, voles) as well as various resident and migratory species of birds, including raptors, waterfowl, passerines and upland game birds. There are also several species of gulls that nest in the cliffs and other

surfaces along Exploits River. Gulls often begin to arrive in March (following the spring freshet), and leave following fledging of the young, typically around mid-August. They have been known to nest in high densities in some locations, upwards of several hundred birds per year.

An Atlantic Canada Conservation Data Centre (AC CDC) report was obtained on November 29, 2025, which documents occurrences of Species at Risk as well as rare flora and fauna within a 5 km buffer surrounding the Project Area. The AC CDC Study Area results show 174 rare flora records and 24 rare fauna records. Of the 174 rare flora records, none of them are listed under Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Species At Risk Act (SARA) or Newfoundland and Labrador Endangered Species Act (NL ESA).

Of the 24 rare fauna records, there were 3 Red Crossbill (*Loxia curvirostra percna*) records, listed as Threatened under both SARA and COSEWIC, and Endangered under the NL ESA. 1 Evening Grosbeak (*Coccothraustes vespertinus*) record, which is listed as Special Concern on both SARA and COSEWIC, and Vulnerable under the NL ESA. 1 record of Olive-sided Flycatcher (*Contopus cooperi)* which is listed as Special Concern under both SARA and COSEWIC, and Vulnerable under the NL ESA. 3 Peregrine Falcon (*Falco peregrinus subsp. anatum*) records, which have been delisted from SARA and COSEWIC but remain Vulnerable under the NL ESA. There were 10 records of Yellow-banded Bumble Bee (*Bombus terricola*) which is listed as Special Concern under both SARA and COSEWIC, and Vulnerable under the NL ESA. Additionally, there was 1 record of Little Brown Bat (*Myotis lucifugus*) which is listed as Endangered under SARA, COSEWIC, and the NL ESA.

Red Crossbill (*Loxia curvirostra percna*)

The Newfoundland subspecies of Red Crossbill is a conifer specialist that depends on mature spruce and fir stands with consistent cone crops. COSEWIC identifies habitat loss and fragmentation as key threats. Mixed woods along the Exploits River corridor likely include balsam fir and black spruce, and the proximity of possibly mature conifer patches within 1 km of the project footprint could support foraging and potential nesting. While the industrial footprint itself offers limited habitat, birds routinely move across several kilometers between feeding and roosting sites. Based on regional records (ACCDC, 2025) and habitat context, the species may occur in the project area, primarily as a foraging visitor.

Evening Grosbeak (*Coccothraustes vespertinus*)

Evening Grosbeak occupies mixed and coniferous forests, often near riparian corridors and human settlements. COSEWIC notes associations with spruce budworm and a diet of seeds, berries, and insects. The project site lies adjacent to mixed woods and the Exploits River, with Grand-Falls-Windsor immediately north, providing suitable edge habitat and food sources. Existing access roads and laydown area create additional edge habitat and food sources. Existing access roads and laydown areas create additional edge conditions. Given these factors and recent regional records (ACCDC, 2025), Evening Grosbeak is considered likely to occur in the project area.

Olive-sided Flycatcher (*Contopus cooperi*)

Olive-sided Flycatcher prefers open or semi-open coniferous and mixed forests with tall snags for perching, typically near wetlands, rivers, or bogs. COSEWIC emphasizes the importance of natural openings and edge habitats. The Exploits River corridor and cleared laydown areas could provide suitable conditions; however, the presence of tall snags or emergency conifers near the footprint would be important for breeding habitat. If such features are present, the species is likely to occur during the breeding season; otherwise, it may use the area for foraging only.

Peregrine Falcon (*Falco peregrinus anatum*)

Peregrine Falcons nest on cliffs, ledges, and occasionally tall structures, and forage over open areas near water. While the Exploits River corridor offers high-quality foraging habitat, nesting suitability depends on the presence of cliffs or rock faces. In the absence of such features, the species is considered possible as a transient forager but unlikely to nest within the project area.

Yellow-banded Bumble Bee (*Bombus terricola*)

This boreal bumble bee occupies forest edges, meadows, wetlands, and disturbed habitats with season-long floral resources. COSEWIC identifies declines linked to disease and habitat loss. The project site includes access, roads, laydown areas, and riparian margins that typically support diverse nectar plants from spring through fall. Coarse woody debris and grassy banks may provide nesting and overwintering sites. Given the regional records and suitable microhabitats, Yellow-banded Bumblee Bee is likely to occur within the project area during the growing season.

Little Brown Bat (*Myotis lucifugus*)

Little Brown Bat forages over water and along forest edges and roosts in buildings, bridges, and tree cavities. Hibernation can occur in craves or mines, with populations severely impacted by White-nose Syndrome. The Exploits River and associated dam structures provide foraging habitat. Overall, the species is considered possible for foraging and unlikely for roosting within the project area.

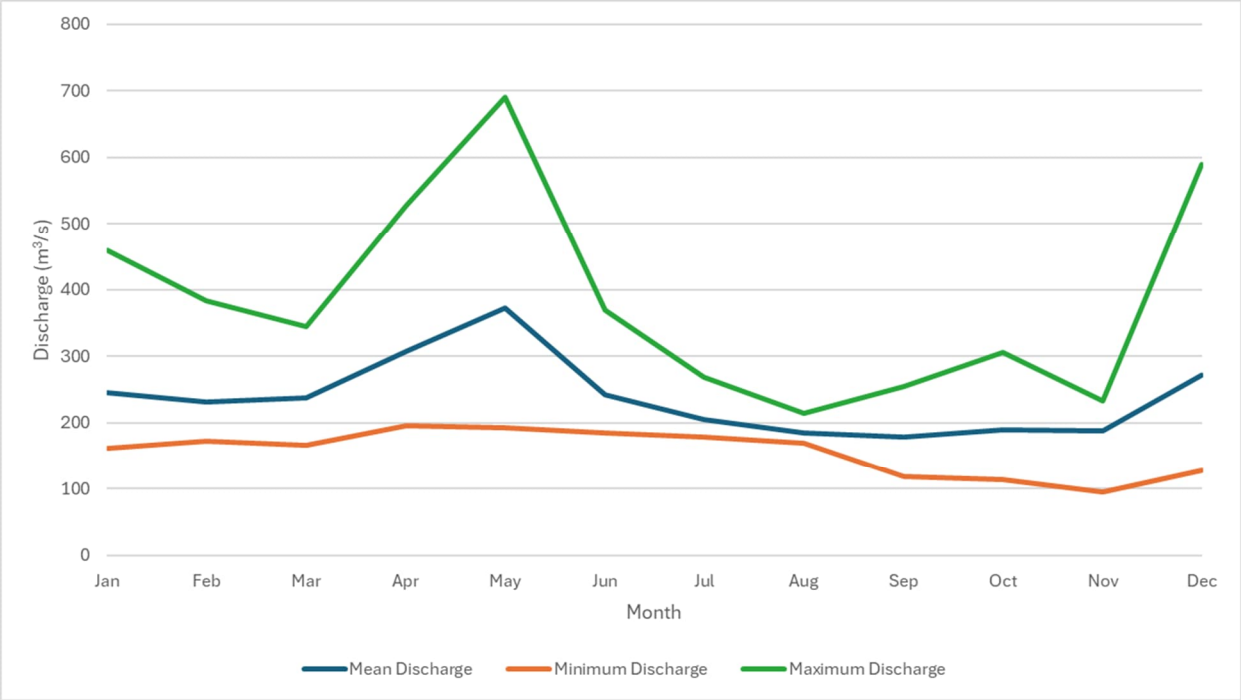
Additionally, communications with ACCDC describe the use of Expert Opinion Maps, which are developed in collaboration with species-specific experts to identify where species at risk, either provincially or COSEWIC listed may occur. While no direct observations for these species exist within the ACCDC study area, their maps indicate that Banded Killifish (*Fundulus diaphanus*) and Rusty Blackbird (*Euphagus carolinus*) are considered possible within this area. Boreal Felt Lichen (*Erioderma pedicellatum*), Newfoundland Marten *(Martes americana atrata)*, and Short-eared Owl (*Asio flammeus)* are also flagged as possible, though their occurrence is considered unlikely based on current habitat conditions and ACCDC's expert opinion.

The Exploits River is in the Exploits Valley in the central part of the Island of Newfoundland. The river extends from Beothuk Lake at its starting point and discharges into the Bay of Exploits near the Town of Botwood on Newfoundland's northeast coast. At approximately 246 km in length, it is the longest river on the Island (and the second longest in the province) and drains an area of over 10,000 km^2.

Water flows have been measured and monitored in the Grand Falls area since the early 1940s, initially at the hydroelectric generating station itself and since 2010 at a monitoring station located just upstream of Grand Falls. Typical low flows are observed in June, July and August with high flows occurring in April and May during the spring freshet. Mean daily flows (overall) are approximately 216 m^3/s and have not been measured below 70 m^3/s. Although the highest flows measured were just below 1,710 m^3/s, they only periodically exceed 299 m^3/s (Figure 5.1).

The Government of Newfoundland and Labrador conducted water quality monitoring on the Exploits River from 1987 to 1994. In general, water quality fluctuated from poor to fair and showed an overall improving trend from 1988 to 1994 (NL WRMD, undated).

Various fish species inhabit the Exploits River, including; Atlantic salmon (*Salmo salar*), brook trout (*Salvelinus fontinalis*), Arctic char (*Salvelinus alpinus*), American eel (*Anguilla rostrata*), rainbow smelt (*Osmerus mordax*) and threespine stickleback (*Gasterosteus aculeatus*). Each of these (with the exception of stickleback) hold recreational and/or commercial value. A brief summary of the overall life history and uses of these species is presented in Table 5.2.



Source: Water Survey of Canada (2026)

Figure 5-1 Exploits River Water Flows (Monthly Discharge, 2010-2013)

Table 5.2 Fish Species Known to Occur in the Exploits River

Common Name	Scientific Name	Biological/Habitat Details
Atlantic salmon	*Salmo salar*	Typical Habitat ■ Preferred temperature: 8-16 °C ■ Preferred depth: Variable ■ Preferred substrate: gravel, cobble, boulder Biology and Ecology ■ Distributed throughout Newfoundland and Labrador ■ Occurs as landlocked (Ouananiche) and anadromous life histories ■ Spawn in clean, well aerated, gravel bottom riffle sections of stream ■ Diet depends on the size and habitat of fish, as well as season but typically consists of aquatic/terrestrial insects and smaller fish within the freshwater environment

Common Name	Scientific Name	Biological/Habitat Details
		■ Juvenile anadromous salmon remain in natal watersheds for 2-4 years ■ Adult salmon generally remain at sea for 1-3 years before returning to their natal stream to spawn Recreational/Commercial Value ■ Recreational fishery ■ There has not been a commercial salmon fishery in Newfoundland since 1997
Brook trout	*Salvelinus fontinalis*	Typical Habitat ■ Preferred temperature: 11-16 °C ■ Preferred depth: 0.06-0.90 m ■ Preferred substrate: gravel, cobble, boulder Biology and Ecology ■ Inhabits lakes and rivers throughout Newfoundland and Labrador ■ Can be landlocked or anadromous ■ Feed mainly on aquatic and terrestrial insects and fish ■ Can hydribize with other salmonid species Recreational/Commercial Value ■ Recreational fishery ■ No commercial fishery in Newfoundland
American eel	*Anguilla rostrata*	Typical Habitat ■ Preferred temperature: variable; below freezing to over 19 °C ■ Preferred depth: <1m ■ Preferred substrate: boulder, rubble, silt, muck, clay Biology and Ecology ■ The only catadromous (spawn at sea) species in Newfoundland and Labrador ■ All American eels spawn in the Sargasso Sea. ■ Can survive in very shallow water, and can move across wet grass or rocks during migrations ■ Eels hibernate over the winter in soft substrates Recreational/Commercial Value ■ Recreational / commercial fishery

Common Name	Scientific Name	Biological/Habitat Details
		■ Few commercial licenses in Newfoundland
Arctic char	*Salvelinus alpinus*	Typical Habitat ■ Preferred temperature: 3-16ºC ■ Preferred depth: >1m ■ Preferred substrate: boulder, rubble, gravel Biology and Ecology ■ Populations in Newfoundland are typically landlocked, and considered to be "relict" species ■ Anadromous life histories only found north of Pistolet Bay in Newfoundland. ■ Slower growing than other salmonids due to their northern distribution ■ Primarily found in deeper lakes on the Island. Recreational/Commercial Value ■ Recreational fishery ■ Several commercial fisheries throughout Arctic Canada
Rainbow smelt	*Osmerus mordax*	Typical Habitat ■ Preferred temperature: approximately 15 ºC ■ Preferred depth: >2m ■ Preferred substrate: cobble, gravel, sand, clay Biology and Ecology ■ Schooling pelagic species found in lakes and nearshore marine habitats. ■ Anadromous populations spawn in rivers in April to June ■ Landlocked populations are known to exist in both normal and dwarf form. Recreational/Commercial Value ■ Recreational fishery ■ Food source for other recreational / commercial fish species
Threespine stickleback	*Gasterosteus aculeatus*	Typical Habitat ■ Preferred temperature: 9-12 ºC ■ Preferred depth: variable, generally <1m

Common Name	Scientific Name	Biological/Habitat Details
		■ Preferred substrate: within or near vegetation Biology and Ecology ■ Common throughout Newfoundland and Labrador, in fresh, brackish and marine environments ■ Maximum lifespan is typically 2-2.5 years Recreational/Commercial Value ■ Limited; may be a food source for larger recreational / commercial species

Sources: Grant and Lee (2004), DFO (2012, 2014a, 2014b)

Of these species, only the American eel is designated as a species of special conservation status, being listed as vulnerable under provincial legislation (NL ESA) as well as being identified as threatened by COSEWIC (2012).

All of the fish species present in Exploits River can undertake migrations (to varying degrees), which may occur as part of their seasonal changes in habitat associated with feeding and/or spawning or to avoid adverse environmental conditions (such as water temperatures). Table 5.3 presents a summary of known high intensity fish migration periods for these species.

Table 5.3 Summary of Key Migration Times for Fish Species Known to Occur in the Exploits River

Species	Season	Direction of Migration
American Eel	Spring Fall	Upstream Downstream
Atlantic salmon	Spring-Fall Spring	Upstream Downstream
Brook trout	Spring Fall	Downstream Upstream
Arctic char[1]	Spring Fall	Downstream Upstream
Stickleback[2]	Spring	Upstream
Rainbow smelt	Spring	Upstream

Source: Grant and Lee (2004); Scott and Crossman (1973)

6. Arctic char do not migrate south of Pistolet Bay
7. Large scale migrations can occur in anadromous populations; landlocked populations undergo localized migrations

5.1.2 Socioeconomic Environment

The community of Grand Falls was originally founded in 1905 to support the development of the pulp and paper industry in Central Newfoundland, which was established and flourished due to the rich timber resources, hydroelectric potential and nearby port site. The Anglo-Newfoundland Development (AND) Company was incorporated in 1902 and the Grand Falls Pulp and Paper mill opened in October 1909. Grand Falls was the official company town established to accommodate mill employees, business owners and support workers, and was eventually incorporated as the Town of Grand Falls in 1961. Other residents settled to the north of the railway in an area known as Grand Falls Station and later the Town of Windsor, which was incorporated in 1938. In 1991 both municipalities were amalgamated to form the Town of Grand Falls-Windsor (GFW 2017). The Town of Grand Falls-Windsor currently has a population of nearly 14,000 residents. Census data shows that while the community experienced growth between 2011 and 2016, the most recent census indicates a slight decline. This recent shift suggests that, although long-term trends included periods of growth, the community has recently experienced a gradual reduction in population (Table 5.4).

Table 5.4 Population of Grand Falls – Windsor (2001-2021)

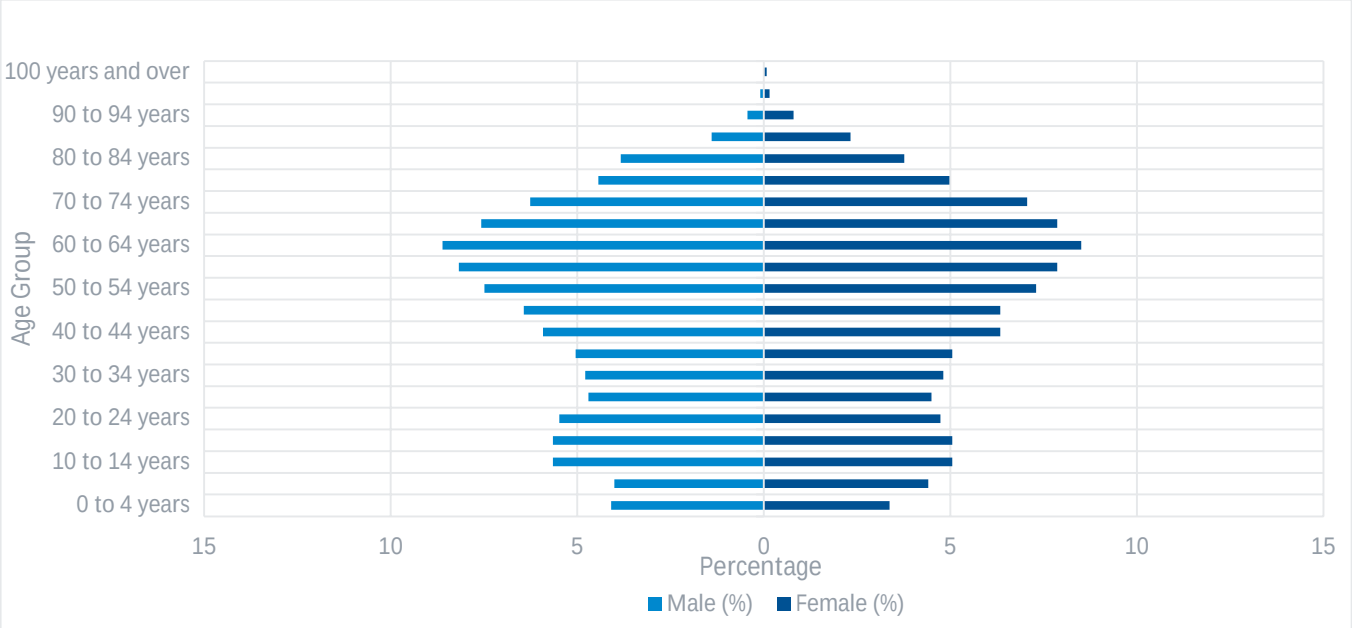
Year	Population	Change from Previous Census
2001	13,340	-5.8%
2006	13,558	1.6%
2011	13,725	1.2%
2016	14,171	3.3%
2021	13,853	-2.2%

Sources: Statistics Canada (2006a; 2006b; 2011a)

The Town of Grand Falls – Windsor is a modern, vibrant community, which includes a wide and diverse range of public and commercial services and infrastructure for their residents and the general region, including municipal (administration, waste management, water and sewer, roads) and provincial / federal (safety and security, health care, employment and social programs, training and education) services and facilities.

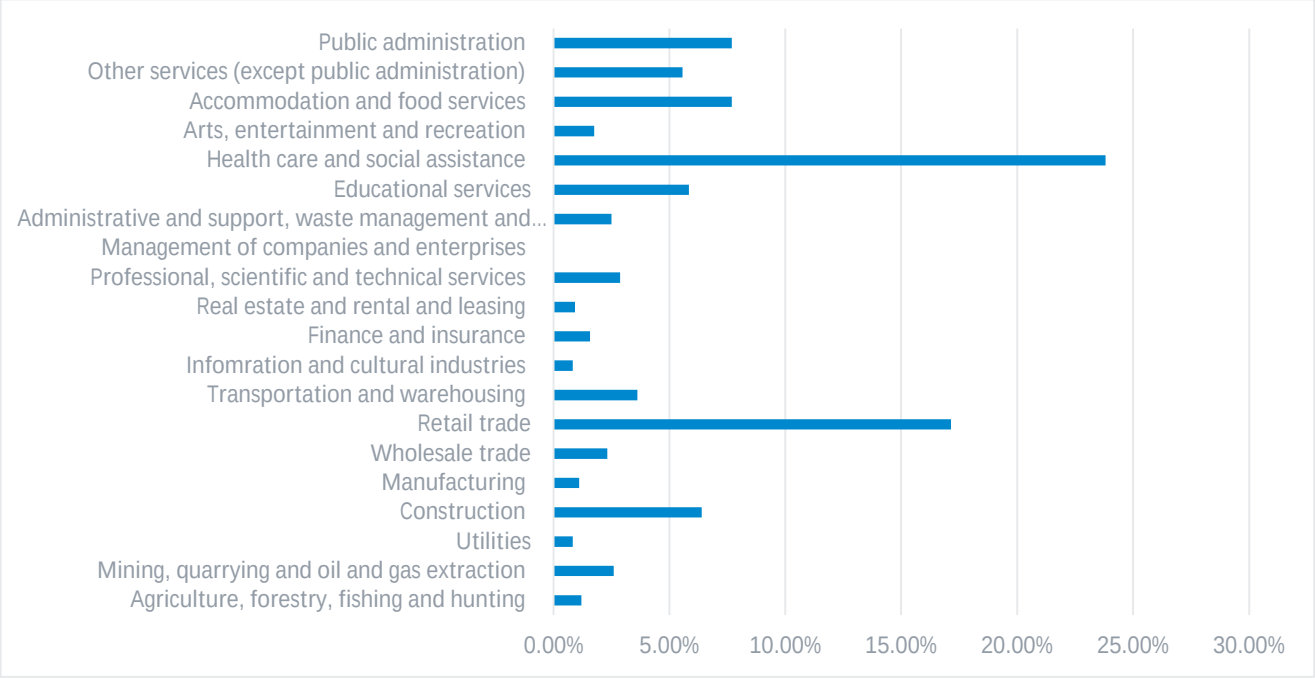
The economy of Central Newfoundland has traditionally been based primarily on natural resource extraction and industrial development. Much of the population lives in the general Grand Falls-Windsor / Bishop's Falls area, which is the industrial, service and government centre for Central Newfoundland. The forestry sector and associated pulp and paper industry has been a major employer in this area for decades; however, following the 2008 closure of the Grand Falls-Windsor paper mill, local residents, industry stakeholders, and municipal and provincial governments have worked to strengthen economic resilience and attract new investments.

Today, manufacturing, commercial, retail, health care, education, and government services currently employ a significant portion of the labour force of the Town and the larger Central Newfoundland region (Statistics Canada, 2022), and tourism and recreational activities and associated facilities are also currently a key component of the area's economy (Figure 5.3).



Source: Statistics Canada (2022)

Figure 5-2 Population of Grand Falls – Windsor: Age / Gender Structure (2021)



Source: Statistics Canada (2017)

Figure 5-3 Grand Falls-Windsor: Labour Force by Industry (2017)

Grand Falls-Windsor is an incorporated municipality with a Municipal Plan and associated Development Regulations. The current Grand Falls generating station is located immediately adjacent to the former Abitibi paper mill on the south side of the community, in an area zoned as Industrial Heavy (IH). Most of this area includes a narrow strip of land zoned as Conservation (CON) along the River's edge. On the opposite side of the river, the dam connects to an area zoned as Rural (RUR) which is the location of the ERMA Fishway and Salmonid Interpretation Centre (GFW 2012; ERMA 2017). This Rural designation extends to the location of Goodyear's Dam and is applied to both banks of the river at this location.

The Exploits is a Scheduled River (#46) for fishing Atlantic salmon and attracts anglers from throughout the province as well as from elsewhere in Canada and the United States. Recreational fishing is regulated by DFO through the Newfoundland and Labrador Fishery Regulations. The Exploits River is included in Zone 4, where the season typically runs from June to early September, with fall angling from early September to early October. Catch-and-release angling with a daily limit of three salmon was available in the fall of 2025-2026 on the main stem of the lower Exploits River from Stoney Brook to the river mouth. DFO maintains a Watershed Management Plan for the Exploits River to meet fish conservation objectives. Regulations for class and retention limits (from 0 to 6 salmon) are established for various sections of the Exploits River based on the abundance of fish in those areas (DFO 2017). The Exploits River is also used for river rafting, canoeing and kayaking, and every year hundreds of people take advantage of this activity along the river, primarily above Grand Falls-Windsor.

A number of other recreational and / or commercial land and resource use activities occur along this section of the Exploits River and in nearby areas, including (RILOT 2017; RC 2017; ERMA 2017; NLDFAL 2026; GFW 2017b; GFGC 2017; NLDTI 2026: Figure 5.4):

- Riverfront Chalets and Rafting Newfoundland (formerly Red Indian Adventures) is a private tourist operation that offers white water rafting and kayaking tours on the Exploits River. The operation is set up upstream of Grand Falls next to Aspen Brook, and generally runs from mid-June to late September;
- Sanger Memorial RV Park, with 45 camping sites, is located approximately five kilometers east;
- Beothuk Family Park, a privately owned park with serviced and unserviced campsites, is located on Big Rushy Pond approximately 1.5 kilometers to the west of the dam site;
- The Newfoundland T'Railway Provincial Park, former Canadian National railbed, is located approximately two kilometers to the north and runs through the Town;
- The Grand Falls Golf Club is located on the Exploits River approximately 1.5 kilometers to the west;
- A Provincial Cottage Planning Area is located on the opposite side of the Exploits River approximately five kilometers to the west of the dam;
- The nearest outfitter, Central Newfoundland Outfitters' Rattling Brook Lodge, is located 17 km east;
- Red Indian Lake Outfitting & Tours Inc. which offers white water rafting, kayaking, hunting, fishing and snowmobiling is located on Beothuk Lake about 135 km to the west;
- The Trans-Canada Highway (Route 1, NL Protected Road) is located about 1.5 kilometers north;

- Grand Falls-Windsor Heliport is located approximately four kilometers to the east of the dam;
- Several quarries are located between two and seven kilometers to the south and east of the dam site;
- Two former waste disposal sites are located approximately five kilometers to the north and west; and
- There are several cranberry farms near Grand Falls to the north and west. The cranberry farming industry is currently increasing in value following several years of depressed prices and government investments. Prices are rising and the provincial annual yield has grown from about 600,000 pounds in 2014 up to nearly 3 million pounds. Harvested cranberries can be processed for global export at a co-op-owned facility in Centreville (CBC, 2025).

5.2 Potential Environmental Interactions and Planned Mitigation

NLH has well over four decades of experience in planning, designing, building, maintaining and operating electrical generation and transmission infrastructure projects in Newfoundland and Labrador, and currently maintains an extensive electricity transmission and distribution system throughout the province. This, along with the fact that the environmental effects of proposed development activities such as those being proposed here are well understood and manageable, means that there is a very good understanding of potential environmental issues and interactions that may be associated with the proposed Project as well as appropriate and effective measures for avoiding or reducing any such effects.

The following sections provide an environmental effects analysis for the proposed Project, including each of its associated components and activities. The analysis focuses upon, and is organized according to, the following themes:

1. Atmospheric Environment;
2. Terrestrial Environment;
3. Freshwater Environment; and
4. Socioeconomic Environment

The analysis for each component includes a discussion and description of the likely environmental considerations (adverse and positive) that may be associated with the Project, with separate subsections for the Construction and Operations and Maintenance phases. Environmental planning and mitigation measures to avoid or reduce environmental effects are identified and considered integrally within the analyses. The assessment also includes possible accidental events and malfunctions that could potentially occur during each phase of the Project. This is followed by a summary and evaluation of the likely residual (with mitigation) environmental effects of the Project.

The environmental analysis concludes with an overview of any environmental monitoring and follow-up which may be required during Construction or Operations and Maintenance.

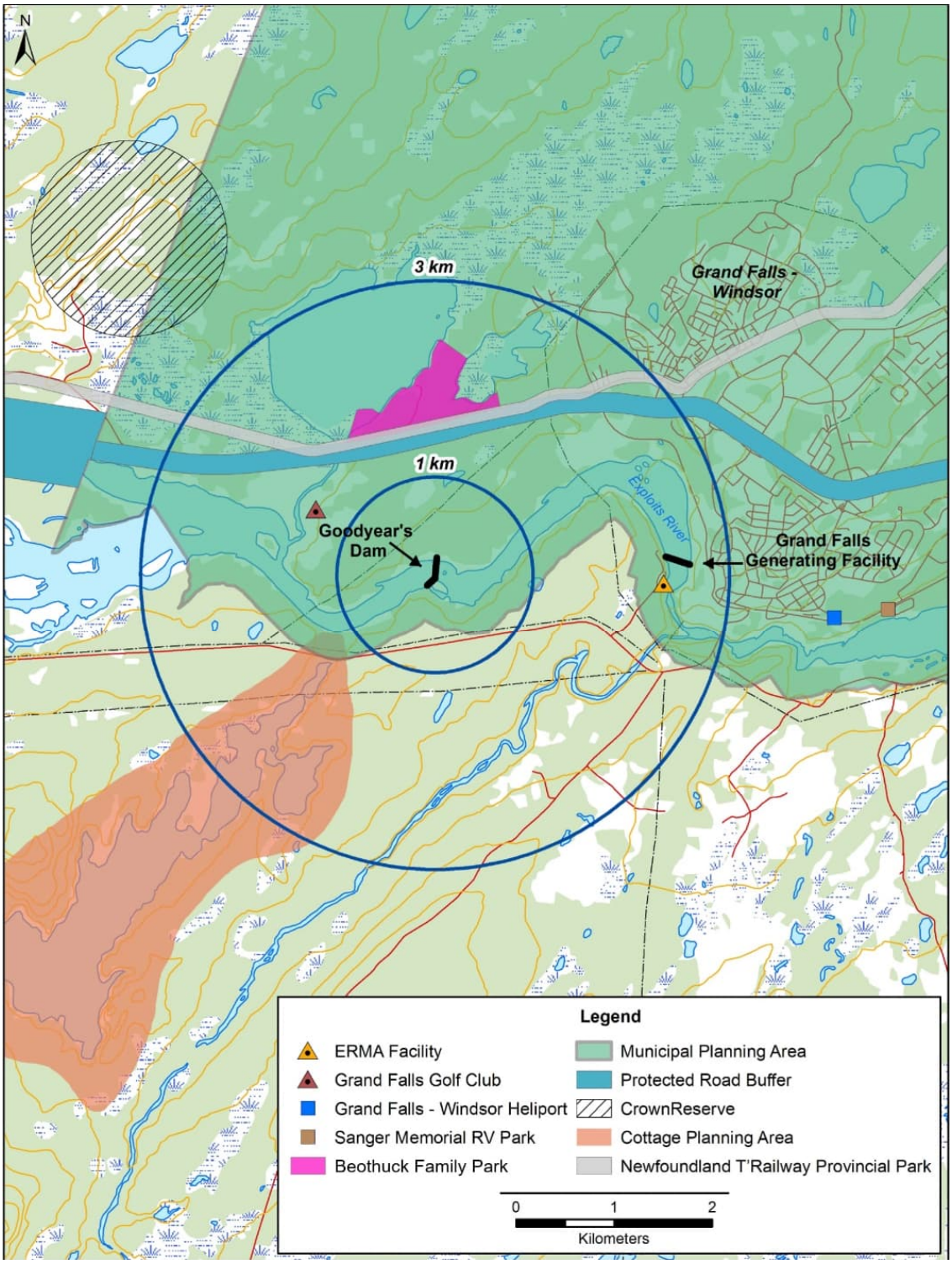


Figure 5-4 Existing (Regional) Socioeconomic Environment

5.2.1 Atmospheric Environment

The environmental analysis for the Atmospheric Environment includes consideration of any likely implications of the Project on air quality and noise levels within and around the Project area and the adjacent community.

Construction

The main potential interactions between the Project and the Atmospheric Environment relate to the use of equipment, primarily during Project construction, and the noise, dust and engine emissions that may be associated with these activities. Construction will include various activities associated with equipment mobilization and set-up, site preparation, movements of construction materials and installation, and other activities, which will result in some minor, temporary and localized air emissions due to project-related dust and emissions from vehicles and equipment.

Noise and dust will also result from blasting operations which may be required to achieve planned excavation depths in the area of the proposed new south fishway. However, these blasting operations will be controlled and localized to comply with Department of Fisheries and Oceans guidelines for blasting near fish habitat and to ensure that the quantities of material requiring excavation/removal are minimized to only that required by Project design specifications.

Project construction will be characterized by standard and routine activities and practices and will occur within a localized area. It will take place within an area having a rural land use designation that has been subject to previous site development and has existing dam and spillway infrastructure in place, and which is somewhat removed from the adjacent community. Project-related vehicles and equipment will be maintained in good repair and inspected regularly, and any associated air emissions from equipment and vehicles will conform to applicable regulations and guidelines. Any fugitive dust from construction activities will be controlled as necessary using dust control agents such as water.

Any potential emissions or interactions with the Atmospheric Environment during Project construction are therefore likely to be negligible (and within existing regulations or standards), localized and short-term (intermittent over the construction period).

Greenhouse gasses (GHG) will be generated by vehicles, heavy equipment, and onsite generators. Total GHG emissions are anticipated to be very small in the context of provincial management objectives, having a negligible impact on provincial total emissions. In accordance with provincial policy and guidelines, standard methods to reduce GHG emissions will be applied, such an anti-idling rule and maintaining vehicles in good condition.

Operations and Maintenance

During Project operations, the nature and degree of on-site activity will be considerably less than that during the construction phase and will be characterized primarily by the continued operation of the facility and periodic maintenance. These operational activities are not particularly noisy, nor are they characterized by significant air emissions or other planned environmental discharges.

Environmental Effects Summary and Evaluation

A summary of potential environmental interactions, identified mitigation measures, and the residual environmental effects of the Project on the Atmospheric Environment is provided in the Table below. The proposed Project is not likely to result in significant adverse environmental effects on the Atmospheric Environment, as any residual effects are expected to be minor, localized, and temporary. Predicted changes in air quality will be limited to short-term dust and exhaust emissions within approximately 500 m of the construction zone, with negligible impact on regional air quality or human receptors. Noise increase will be confined to the immediate work area, with no measurable effect on nearby communities or long-term wildlife populations.

Table 5.5 Environmental Effects Assessment Summary: Atmospheric Environment

Environmental Component	Project Phase / Potential Interaction			Key Considerations and Environmental Mitigation	Residual Effects
	Construction	Operations	Issues / Interactions		
Air Quality	•		■ Construction works (noise, dust, exhaust) ■ Blasting (noise, dust) ■ Equipment use (vehicles, fuel consumption, exhausts) ■ Possible accidental event (fire, others)	■ Localized construction activity. ■ Controlled and localized blasting operations. ■ Project location within existing rural land use area. ■ Standard construction and operational practices. ■ Regular inspection and maintenance of equipment. ■ Accidental event prevention and response.	■ Minor, localized increase in dust and exhaust emissions during construction. Effects limited to immediate work zone. No measurable change in regional air quality. Temporary and reversible. Population exposure negligible due to rural setting.
Noise Levels	•				■ Short-term increase in noise during construction. No significant impact on residential areas. Wildlife may experience temporary disturbance but expected to return post-construction. No long-term population level effects.

5.2.2 Terrestrial Environment

The Terrestrial Environment is comprised of relevant components of the "on-land" biophysical environment which may interact with the Project, including vegetation, soils, landforms and wildlife.

Construction

The proposed Project site occurs within an already developed area, and Project construction will involve limited additional vegetation clearing, grubbing, excavation or other on-land site preparation activities. Sites where clearing and land modifications are required involve the development of the proposed temporary laydown areas and the installation of the new south fishway. No listed (protected) plant species are known or likely to occur within or near the proposed Project area.

Adverse interactions with wildlife are also not likely to occur during the Project's construction phase. The long-standing presence and on-going operation of the existing dam and spillway at this location has somewhat limited the use of the site itself by most wildlife. Any wildlife (such as avifauna) that do use the area have likely habituated somewhat to on-going human activity. There are no SARA and/or NL ESA listed species that are known to occur within or near the proposed Project area. The potential for interactions between the Project and wildlife is therefore limited.

The head pond level above the existing spillway will need to be lowered for short periods during construction to allow for work on the dam to be done under safer, more stable conditions. This will be accomplished by diverting river flows through a discharge channel in the south side of the structure created prior to placement of buttressing material. This will allow construction in low flow conditions and reduce the risk associated with sedimentation in the river.

Any wildlife that may be present in the immediate area that may be disturbed by Project-related noise, human presence, variations in water levels, or other interactions may temporarily avoid the immediate vicinity of such works during the period of construction. Any such avoidance and disturbance associated with the Project is not expected to affect the overall presence or health of any wildlife population in the area, and there is similar habitat available throughout the larger, surrounding area.

As specified in the project specific Environmental Protection Plan, the following additional mitigative measures will be implemented to further reduce the potential for interactions between Project activity and any wildlife that may occur in the area at those times:

- Work areas will be kept clear of garbage;
- Project personnel will not hunt or harass wildlife;
- Equipment and vehicles will yield right-of-way to wildlife; and
- Any nuisance animals will be dealt with in consultation with the NL Inland Fish and Wildlife Division.

NLH currently has procedures and facilities in place for the management of solid, liquid and hazardous wastes at its Exploits Generation operations, which will apply to the construction and operations phases of the proposed Project. Waste materials generated through construction activities will be removed from the area and disposed of at an existing, approved site. Non-hazardous construction refuse will be stored in covered metal receptacles and will be disposed of on an as-needed basis at an approved landfill site, as per NLH's on-going operations and practices. Waste materials will be reused / recycled where reasonably practical.

Any hazardous wastes will be stored in sealed, labeled containers and disposed of according to applicable regulations and NLH practice. These include procedures for the characterization / identification, storage, inspection, labeling and transportation of hazardous wastes produced at the facility, as well as emergency preparedness / prevention and training. There will therefore be no adverse interaction between construction waste materials and the environment.

There will not be any new fuel storage facilities or permanent fueling locations established as part of this Project. Heavy equipment and generators will be fueled from delivery trucks or slip-tanks at temporary fueling stations prepared to contain accidental spillage (e.g. plastic liner under sand) and equipped with spill kits. Any chemicals and other materials that are being used during construction at the worksites will be handled and used in accordance with NLH procedures and in compliance with all relevant regulatory requirements for such activities. Personnel responsible for the use and handling of such products will be appropriately trained prior to commencing work at the site. NLH maintains a supply of hydrocarbon spill response equipment and materials at its Grand Falls generation station, and appropriate equipment and supplies will be maintained at the work site in an accessible location. Personnel working on the Project will be appropriately trained and knowledgeable about the project specific contingency plans provided in the EPP, including spill response procedures, and any such incidents will be reported to environmental authorities as applicable.

Operations and Maintenance

During the operations phase of the Project there will be no soil or vegetation disturbance, and therefore, little or no potential for effects to these aspects of the terrestrial environment. Wastes, fuels and other such materials and substances will continue to be handled, used and disposed of properly throughout the life of the Project, as outlined earlier. None of the facility's operational activities are or will be particularly noisy or otherwise disruptive to the surrounding environment.

No additional interactions with or adverse effects on the Terrestrial Environment are therefore anticipated during this phase of the Project.

Environmental Effects Summary and Evaluation

A summary of potential environmental interactions identified mitigation measures and the residual environmental effects of the Project on the Terrestrial Environment is provided in the Table below. The proposed Project is not likely to result in significant adverse environmental effects on the Terrestrial Environment, as residual effects will be minor, localized, and largely confined to previously disturbed areas. Vegetation clearing will be limited to small areas for laydown and fishway construction, with no anticipated impact on rare species. Soil disturbance will be minimal and mitigated through erosion and sediment controls, and wildlife effects will be restricted to temporary displacement of common species within active work zones.

Table 5.6 Environmental Effects Assessment Summary: Terrestrial Environment

Environmental Component	Project Phase / Potential Interaction			Key Considerations and Environmental Mitigation	Residual Effects
	Construction	Operations	Issues / Interactions		
Vegetation	•	•	■ Clearing/ local habitat area reduced	■ Work primarily within existing disturbed footprint (dam, abutments, access roads) ■ Minor clearing for laydown areas and fishway footprint. ■ Localized and clearly delineated work areas ■ Compliance with applicable regulations and permits	■ Localized clearing of common vegetation near south fishway and laydown areas. No rare species expected. Effects are minor, temporary, and reversible through natural regeneration.
Soils	•	•	■ Compaction and erosion/ soil loss ■ Possible fuel or chemical spills	■ Limited new Project-related ground disturbance ■ Erosion and sediment control measures for buttressing and fishway excavation. ■ Accidental event prevention and response	■ Small-scale soils disturbance limited to south fishway and buttress areas. No long-term soil productivity loss expected.
Wildlife	•	•	■ Noise, human presence, vehicle and equipment use,	■ No harvesting or harassment of wildlife by Project personnel	■ Temporary displacement of common wildlife species with active work areas due to noise and human activity. Negligible

Environmental Component	Project Phase / Potential Interaction			Key Considerations and Environmental Mitigation	Residual Effects
	Construction	Operations	Issues / Interactions		
			other disturbances ■ Habitat disturbance	■ Waste and other materials management (facilities and procedures) ■ Accidental event prevention and response ■ Minimal new areas of physical disturbance	habitat loss given small footprint and existing disturbance.

5.2.3 Aquatic Environment

The Aquatic Environment includes surface water (quantity and quality) and fish and fish habitat which may interact with the Project.

Construction

As described in Section 2, the proposed construction work will be undertaken in low flow conditions, through the establishment of appropriate water flow modification. The discharge channel will be used during construction to lower water levels at work areas below the construction elevation (i.e., less water flowing over the structure) to reduce potential for sedimentation and interaction with fish and fish habitat.

During each of the three years of planned construction activity, all major work areas will be isolated to the extent reasonably practical from river flows and fish migration pathways. During year one installation of the new fishway, cofferdams will be constructed at the edge of the river channel where the proposed inlet and outlet are located. During years two and three, the north and south dam areas will be buttressed (placement of coarse rocks) under low flow conditions using the discharge channel constructed in year two to lower the river level below the crest level of the existing spillway. In year three, flow will be diverted over the north half of the structure as the south side will be buttressed and the discharge channel will be filled in for access.

Migrating Atlantic salmon will still be able to pass around Goodyear's Dam, and the area of construction, using the new south fishway and possibly the north side fishway during early construction. The north fishway will be infilled (to provide access to the north section of the timber crib structure) and likely will be completely decommissioned as fish passage will be supported by the new south fishway (which provides a more modern and suitable design). The north fishway would be closed to flow and any fish will be rescued prior to infilling.

The proposed construction work will be performed in a manner that ensures deleterious substances, such as (but not limited to) new and demolished concrete, fuels and oils, do not enter the river, either directly or indirectly. Tools and equipment will not be washed in any body of water and wash water will not be discharged directly into any waters. A designated cleaning area for tools will be established. Wastes, fuels and other such materials and substances will be handled, used and disposed of properly throughout the life of the Project, as outlined earlier, with appropriate equipment and procedures in place to respond to an accidental spill should one occur.

The overall replacement structure, as outlined in Section 2.4.1 above, will include rockfill buttressing that will have a low 5H:1V slope on the downstream end of the spillway. This low slope will allow greater structural stability but will extend the downstream extent of the footprint on the riverbed. Based on the layout provided in Figure 2-4, the footprint will cover an additional 1,830 m^2 (18.3 units) of the river bottom immediately below the existing structure.

The riverbed and area have been observed and photographed from shore at various stages since the initial breach in 2015; direct measurements of water depths, velocities, and substrate are too dangerous, given the flows over the structure. Historic design drawings can also assist informing the fish habitat that will be affected by the updated structure footprint.

Based on survey drawings of the Goodyears Dam upgrade/extension in circa 1969 (Drawing 79D9159 – Appendix C), the riverbed within the downstream footprint of the proposed structure can be separated into two distinct areas; a deeper section extending from the south shore to approximately one-third the river width and the remaining northern section. The deeper southern portion was the location of the natural river thalweg and based on the drawing, the overall water depth in this section is approximately 6.9 m (22.5') below the crest of the existing dam. Given the natural depth and thalweg location, it can be reasonably assumed that the substrate would have consisted of relatively large material

(boulders, rubble, cobble) because the majority of smaller material would be flushed downriver. It is likely that if any smaller material had accumulated prior the breach, it would have been again flushed further downriver. Figure 5-5 provides an example of the flows during the breach in 2015.

Figure 5-5: Image of Goodyears Dam (looking north) during 2015 breach (June 23, 2025) showing flows along the southern section

The riverbed along the northern two-thirds of the river within the footprint of the proposed structure was clearly visible during the 2015 breach as it was much shallower and therefore slightly exposed (Figure 5-6). As shown in Figure 5-6 and Drawing 79D9159 (Appendix C), the water depth of the habitat that would be within the project footprint ranges from approximately zero (substrate at the surface) to two metre (6') water depth. Visible substrates include bedrock (seen near the mid-section of the dam base), boulders, rubble, and cobble.

Figure 5-6: Image of Goodyears Dam (looking south) during 2015 breach (June 23, 2025) showing substrates and substrate depth relative to the dam crest behind the northern section

The habitat that will be affected by the footprint of the proposed structure upgrade is therefore determined to be 1,830 m^2 of habitat that is suitable for juvenile salmonid rearing. Adult Atlantic Salmon may also use the area during warmer water conditions to access more oxygenated water as it spills over the existing structure. There is no spawning habitat of significance anticipated to be within the proposed project footprint and the quality of rearing habitat is considered moderate, given the higher turbulence of water falling over the existing structure. It should be noted that the proposed upgraded structure will also provide well oxygenated water below its footprint as flows overtop the spillway crest.

Operations and Maintenance

During planned operations activities, there will be no additional direct interactions with the Aquatic Environment. Project infrastructure will continue to be used, inspected and maintained / repaired as required, and all such activities will occur in compliance with relevant regulations and permits. Again, Goodyear's Dam and overall Grand Falls Generating Station will continue to function as per current operational activities and parameters, including continued compliance with the Minimum Flow Agreement with DFO and NLH's other measures and methods regarding water management and fish conveyance. The new south side fishway will function as the permanent fish passage facility going forward and will be studied for effectiveness by a fish passage monitoring program that will be implemented during construction and initial operation including both video monitoring and radio telemetry. The design will include a solar-

powered camera underwater in the exit pool, pointing towards the exit.

No additional interactions or adverse effects to the Aquatic Environment are therefore anticipated during this phase of the Project.

Environmental Effects Summary and Evaluation

A summary of potential environmental interactions identified mitigation measures, and the residual environmental effects of the Project on the Aquatic Environment is provided in the Table below. The proposed Project is not likely to result in significant adverse environmental effects on the Aquatic Environment. Residual effects will be minor, localized, and temporary. In the case of the habitat lost under the footprint of the proposed structure, the residual effect would also be considered minor, localized, but permanent. Short-term increases in turbidity may occur during buttressing and fishway construction, but they will be confined to the immediate work zone and mitigated through isolation measures and sediment controls.

Table 5.7 Environmental Effects Assessment Summary: Aquatic Environment

Environmental Component	Project Phase /Potential Interaction			Key Considerations and Environmental Mitigation	Residual Effects
	Construction	Operations	Issues / Interactions		
Surface Water (Quantity and Quality)	•	•	■ Drainage / sedimentation ■ Potential accidental spills	■ No water use / extraction associated with this Project ■ Construction work will be undertaken in a low flow environment ■ Reduced head pond used to minimize flows at work areas ■ Measures to prevent deleterious substances from entering water ■ Compliance with regulations and permits ■ Accidental event prevention and response	■ Minor, localized increase in turbidity during material placement and fishway construction. Effects limited to immediate work zone and short duration. No measurable change in downstream water quality anticipated. Accidental spill risk mitigated by prevention and response measures.
Fish and Fish Habitat	•	•	■ Drainage / sedimentation ■ Fish migration ■ Potential accidental spills	■ Construction work will be undertaken in a low flow environment ■ Construction of new south side fishway for fish passage during construction and operation	■ Minimal disruption to fish movement during Construction, short-term increase in sedimentation near work zone. No long-term habitat loss or fish population-level effects

Environmental Component	Project Phase /Potential Interaction			Key Considerations and Environmental Mitigation	Residual Effects
	Construction	Operations	Issues / Interactions		
				■ Minimal fish habitat loss / alteration ■ Measures to prevent deleterious substances from entering water ■ Compliance with regulations and permits ■ Scheduling of project in-water construction activities to avoid sensitive fish migration periods (Sep-Oct) ■ Continued compliance with Minimum Flow Agreement and other NLH operational procedures ■ Accidental event prevention and response	anticipated. Fish passage maintained throughout construction via staged approach.

5.2.4 Socioeconomic Environment

The Socioeconomic Environment includes relevant components of the human and cultural environments, including historic and heritage resources, land and resource use (commercial, municipal, recreational), human health and well-being, community services and infrastructure, and economy.

Historic resources include sites and objects of historic and archaeological, cultural, spiritual and paleontological importance, which may be protected under the Newfoundland and Labrador Historic Resources Act (1985) administered by the PAO of the NL Department of Tourism, Culture, Arts and Recreation. Ownership of all archaeological objects is vested in the Crown. Development activities and associated ground disturbance have the potential to disturb or destroy archaeological sites and other historic resources, where they exist.

Since the 1960's, several historic resource assessments and directed archaeological research projects have been completed along the Exploits River, resulting in the identification of a long-standing record of interior settlement and land-use by indigenous and non-indigenous peoples during the Pre-contact and/or Historic periods. Even though one archaeological survey did encompass the area around Goodyear's Dam (Schwarz, 1992), there still exists the possibility that historic/archaeological materials deriving from one or more of the documented occupations could be present within the Project area and impacted during the proposed construction activities. Consequently, NLH, in consultation with the PAO, undertook a Stage 1 Historic Resources Assessment of the Project area in accordance with guidelines for historic resources research in the province of Newfoundland and Labrador under the Historic Resources Act, 1985. Documentation of that assessment is provided in the report titled Stage 1 Historic Resources Assessment Goodyear's Dam Replacement Project Exploits River Newfoundland and Labrador, December 5, 2017. The Assessment concluded that no materials of historic resource significance were identified at any of the areas investigated, and the potential for any to be encountered within the Project area during future construction activities appears to be low.

The proposed Project involves limited ground clearing and occurs within existing disturbed areas that have already been subject to past development. It is therefore very unlikely that the Project will result in the disturbance or destruction of historic resources. During Project construction, however, standard precautionary and reporting procedures will be implemented. Should an accidental discovery of historic resources occur, all work will cease in the immediate area of the discovery until authorization is given for the resumption of the work. Any archaeological materials encountered will be reported to the PAO, including information on the nature of the material discovered and the location and date of the find. During the operations phase of the Project there will be no further ground disturbance, and therefore, little or no potential for effects on historic and heritage resources. The precautionary and reporting procedures implemented for construction will continue to be in place throughout the life of the Project.

Project construction will be characterized by standard and non-intrusive activities and practices and will occur within a small and localized area. The proposed Project site has been subject to past development. The site is near Town of Grand Falls – Windsor but does not overlap with any municipal infrastructure and no other commercial land and resources uses occur in the immediate Project area. There is indication, from the conditions of the existing gravel roads and trails, that the Project area is used for recreational purposes including ATV activity, walking/hiking, bicycling and camping. The Department of Fisheries and Oceans has placed signs on both the north and south banks in the vicinity of the dam which indicate fishing is prohibited. These signs are located downstream of the Project area.

The Project is not expected to have any negative implications for other existing commercial or municipal land use activities in the area, or on human health and well-being in local communities or elsewhere. However, public access to work sites will be restricted for safety and security purposes during construction and new fencing will be erected to restrict access for public safety reasons, following the Canadian Dam Association – Public Safety Around Dams (CDA

PSAD Guidelines).

Again, construction activities will be planned and completed such that Goodyear's Dam, and the Grand Falls Generating Station will continue to function as per current NLH operations, including continued compliance with the Minimum Flow Agreement with DFO and NLH's other measures and methods regarding water management and fish conveyance.

Some development projects can result in increased demands on local, regional and provincial services and infrastructure. This may include both direct Project requirements, such as in the use of local transportation and accommodations, as well as indirect demands from project workers and their families. Given the relatively small size of the Project's construction labour requirements (Section 2) and because its operations will not increase or otherwise change NLH's current labour force at Grand Falls, no adverse effects related to the availability or quality of community services and infrastructure are anticipated. NLH will continue to consult with the local communities and other stakeholders regarding Project related activities, schedules and requirements including, for example, the transportation of large loads to and through Town during Project construction.

Project construction will be carried out by a qualified and experienced Contractor selected by NLH through a competitive bid process. The Project will therefore create business opportunities during its construction phase (Section 2.4), and the requirement for labour and for goods and services during Project construction may provide opportunities for local and provincial workers and businesses. These direct economic benefits will be supplemented by indirect and induced "spin-off" effects through, for example, spending by Project employees and contractors.

Environmental Effects Summary and Evaluation

A summary of potential environmental interactions identified mitigation measures, and the residual environmental effects of the Project on the Socioeconomic Environment is provided in the Table below. The proposed Project is not likely to result in significant adverse environmental effects on the Socioeconomic Environment. Historic resource risk remains low due to the limited and localized nature of ground disturbance, with precautionary measures in place. Land and resource use will experience only minor, short-term access restrictions near the dam site during construction, with no long-term changes. Human health and well-being will not be affected beyond temporary, mitigated construction-related noise and dust. Community services and infrastructure will see negligible demand, while the Project will provide short-term economic benefits through local employment and procurement.

Table 5.8 Environmental Effects Assessment Summary: Socioeconomic Environment

Environmental Component	Project Phase / Potential Interaction			Key Considerations and Environmental Mitigation	Residual Effects
	Construction	Operations	Issues / Interactions		
Historic Resources	•		■ Any new ground disturbance	■ Location developed as a dam and spillway since 1911 ■ Limited new ground disturbance, localized and clearly delineated work areas ■ Stage 1 Historic Resources Assessment concludes potential for historic resources to be encountered is low. ■ Standard precautionary and reporting procedures	■ Low likelihood of encountering historic resources. If discovered, work will stop and follow reporting protocols. No significant residual effects are anticipated.
Land and Resource Use	•	•	■ Potential direct interaction with current uses and other disturbances (noise, dust, visibility, access, etc.)	■ Project location within Rural zoning area in Town of Grand Falls-Windsor Municipal Plan ■ Localized construction activity ■ Distance from local community, no likely overlap and minimal interaction ■ Restricted access for safety and security during construction and operation.	■ Minor, temporary disruption to access near dam site during construction. No long-term changes to land use or resource access.

Environmental Component	Project Phase / Potential Interaction			Key Considerations and Environmental Mitigation	Residual Effects
	Construction	Operations	Issues / Interactions		
				■ Continued compliance with Minimum Flow Agreement and other current NLH operational procedures	
Human Health and Well-Being	•	•	■ Potential implications of Project-related disturbances for human health and well-being in local communities or elsewhere	■ Project location developed as a dam and spillway since 1911 ■ Localized, routine and short-term construction activity ■ No construction or operational discharges or emissions to the environment ■ Restricted access for safety and security during construction and operation. Accidental event prevention and response	■ No measurable effect on human health. Temporary noise and dust during construction, mitigated by standard practices.
Community Services and Infrastructure	•	•	■ Potential Project use of, and demands for, local services and infrastructure	■ Localized and short-term construction activity, small construction workforce ■ No new operational employees ■ Timing and scale of Project activities ■ Distance from and minimal interaction with the community	■ Negligible effect on community services. Short-term, minor increases in demand for accommodations and supplies during construction.

Environmental Component	Project Phase / Potential Interaction			Key Considerations and Environmental Mitigation	Residual Effects
	Construction	Operations	Issues / Interactions		
Economy	•	•	■ Employment and business opportunities	■ Positive effects (direct and indirect)	■ Short-term employment and indirect benefits to local business during construction. No long-term operational employment changes.

5.3 Environmental Monitoring and Follow-up

Any potential environmental issues which may be associated with the Project can be addressed and mitigated using good construction and operational practices and procedures. These will be further addressed through the specific environmental permitting requirements and compliance standards and guidelines which will apply to Project activities and components.

NLH has worked closely with DFO to understand fish migration and passage at its Exploits River facilities, including the Goodyear's Dam site, and will continue to do so to ensure successful fishway operations.

Once operational, the Project will be subject to regular inspections and maintenance as required. The Proponent is committed to obtaining all required authorizations for the proposed Project, and to complying will all applicable regulations.

5.3.1 Fish Passage Monitoring Plan

To ensure continued migration of Atlantic salmon and other species during and after Goodyear's Dam life extension project, a comprehensive fish passage monitoring program will be implemented. The primary objectives of this program will be to assess the effectiveness of the new and existing fishways, document fish movement patterns, and provide data to inform adaptive management and regulatory compliance. A detailed plan will be provided to DFO for review and approval prior to construction.

The monitoring program may use complementary methods such as:

- Underwater video systems installed at exits of existing fishways (while operational). These systems would visually confirm and count adult salmon successfully navigating the fishways, providing a non-invasive means of monitoring overall passage success.
- Radio telemetry used to track the approach, passage, and behavior of tagged adult Atlantic salmon as they encounter the dam and fishways. This method would provide detailed data on movement patterns, potential delays, and the effectiveness of the new structures in facilitating migration.

A monitoring schedule will be agreed with DFO, designed to capture both immediate and longer-term effects of the dam upgrades on fish passage.

Results from the monitoring program will be analyzed to confirm the effectiveness of mitigation measures and guide any necessary adjustments to project operations or fishway design. Findings will be reported to regulators and stakeholders as required, supporting transparency and adaptive management.

5.4 Cumulative Effects

Residual effects (after mitigation) resulting from Project activities are generally local and temporary, such as noise, dust, sedimentation, and local economic benefits. No other major projects are anticipated that may cause similar effects on the same environmental components within the study area. One exception is Greenhouse Gas (GHG) emissions from operation of heavy equipment and vehicles during site preparation and construction. Such emission will contribute to

Climate Change in combination with all other sources of GHG's provincially and nationally. It is beyond the ability of a proponent to mitigate effects of Climate Change, however, government policies and regulations at the provincial and national level are in place to reduce GHG emissions over time and NLH is committed to meeting all applicable expectations, including implementation of anti-idling protocols during Construction. The Project related GHG contribution to Climate Change will be minimized to the extent reasonably practical.

6. Summary and Conclusion

The existing hydroelectric generating station at Grand Falls-Windsor is the largest of three existing stations operated and maintained by NLH's Exploits Generation operating division and has an electrical generating capacity of 75 MW. The facility includes Goodyear's Dam located approximately 4 km upstream of the Generating Station which helps control frazil ice accumulation at the intake of the generation station during winter operations.

Goodyear's Dam is currently in poor condition. The rock-filled timber crib structure has deteriorated and will continue to degrade over time. Approximately one third of the length of the spillway (93 m) failed near the south abutment in 2015, and emergency repairs were successfully undertaken. However, due to the nature of those repairs, they are considered to be temporary only, and additional life extension work is required.

The current scope involves a comprehensive life extension of Goodyear's Dam, rather than a full replacement. The proposed works include staged rockfill buttressing of both the north and south sections of the dam to address immediate structural deficiencies and extend the dam's service life by approximately ten years. In addition, a new vertical slot fishway will be constructed on the south side of the dam to enhance fish passage for Atlantic salmon and other species, while the deteriorated north fishway will be decommissioned following completion of the new structure. Upgrades to access roads and laydown areas are also included to support construction and ongoing maintenance.

Construction activities are planned to be completed in stages over a three-year period (2026-2028), with all in-water work scheduled outside the annual salmon migration season to minimize species impacts. Fish migration will be maintained throughout construction via the staged implementation of fishways.

The proposed project has been planned and will be implemented in accordance with NLH's environmental management policies, regulatory requirements, and best practices. Through the application of mitigation measures identified in this EA registration, the project is expected to avoid or reduce potential adverse environmental effects. Upon completion, Goodyear's Dam will continue to function in support of the Grand Falls-Windsor Generating Station, maintaining its essential role in regional energy supply and environmental management until a permanent long-term solution can be developed.

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Appendix A – List of Potentially Applicable Permits and Authorizations

APPENDIX A

List of Potentially Applicable Permits and Authorizations (Provincial, Federal, Municipal)

Approval Potentially Required	Legislation / Regulation	Project Component / Activity Requiring Approval or Compliance	Department or Agency	Requirements
Government of Newfoundland and Labrador				
Permit for any Alteration to a Body of Water	*Water Resources Act*	Any activities which may alter a water body	Water Resources Management Division, Department of Environment, Conservation and Climate Change	Permits are required for construction activities within 15 m of the high watermark of any water body. An application form is required for each alteration.
Water Use License	*Water Resources Act*	Extraction of water from a surface or groundwater source	Water Resources Management Division, Department of Environment, Conservation and Climate Change	Approval is required to extract water from a surface or groundwater source for subsequent use.
Policy Directives	*Water Resources Act*	Project activities (as applicable)	Water Resources Management Division, Department of Environment, Conservation and Climate Change	The Department has a number of potentially applicable policy directives in place for particular types of in or near water work
Cutting Permit	*Forestry Act*	Clearing of trees from quarry and laydown areas	Forestry Division, Department of Natural Resources	A cutting permit is required from the local Forestry office
Operating Permit	*Forest Fire Regulations*	Equipment use during forest fire season	Forestry Division, Department of Natural Resources	ATVs and equipment must comply with exhaust spark reduction requirements.
Compliance Standard	*Fire Prevention Act, and Fire Prevention Regulations*	On-site structures (temporary or permanent)	Engineering Services Division, Digital Government and Service NL	All structures must comply with fire prevention standards.
Quarry Permit (if required)	*Quarry Materials Act and Regulations*	Extracting borrow material	Mineral Lands Division, Department	A permit is required to dig for, excavate, remove and dispose of any Crown quarry

Approval Potentially Required	Legislation / Regulation	Project Component / Activity Requiring Approval or Compliance	Department or Agency	Requirements
			of Natural Resources	material.
Compliance Standard	*Environmental Control Water and Sewage Regulation under the Water Resources Act*	Any waters discharged from the Project	Pollution Prevention Division, Department of Environment, Conservation and Climate Change	A person discharging sewage and other materials into a body of water must comply with the standards, conditions and provisions prescribed in these regulations for the constituents, contents or description of the discharged materials.
Compliance Standard	*Occupational Health and Safety Act and Regulations*	Project-related occupations	Digital Government and Service NL	Outlines minimum requirements for workplace health and safety. Workers have the right to refuse dangerous work. Proponents must notify Minister of start of construction for any project greater than 30 days in duration.
Compliance Standard	*Workplace Hazardous Materials Information System (WHMIS) Regulations, under the Occupational Health and Safety Act*	Handling and storage of hazardous materials	Operations Division, Digital Government and Service NL	Outlines procedures for handling hazardous materials and provides details on various hazardous materials.
Permit to Occupy Crown Lands	*Lands Act*	Use of laydown area	Crown Lands Division, Department of Municipal and Inter-governmental Affairs	A permit is required to occupy crown lands.
Government of Canada				
Applications for Authorization under Paragraph 35(2)(b) of the Fisheries Act	*Fisheries Act and Regulations*	Project activities in or near water	Department of Fisheries and Oceans	This federal legislation provides protection to commercial, recreational, and Aboriginal fisheries by protecting the fish resources and habitats that support these activities. Any potential serious harm to fish as a result of a project that results in the death of fish or the permanent alteration to, or destruction (PAD) of, fish habitat as determined by DFO requires authorization under Section 35(s) of the Fisheries Act, including adequate and appropriate measures to offset any such serious harm. Proponents may prepare and submit a

Approval Potentially Required	Legislation / Regulation	Project Component / Activity Requiring Approval or Compliance	Department or Agency	Requirements
				request for review to DFO to determine/ confirm whether or not such an approval is needed.
Request for Review	*Fisheries Act and Regulations*	Fishway	Department of Fisheries and Oceans	The RFR process is designed to ensure that projects comply with the Fisheries Act and the Species at Risk Act. It helps to evaluate how proposed activities may affect aquatic environments and species, ensuring that necessary precautions are taken to protect fish habitats.
Compliance Standard	*Fisheries Act, Section 36(3), Deleterious Substances*	Any run-off from the project site being discharged to receiving waters	Environment Canada Department of Fisheries and Oceans	Environment Canada is responsible for Section 36(3) of the Fisheries Act. However, DFO is responsible for matters dealing with sedimentation. Discharge must not be deleterious and must be acutely non-lethal.
Compliance Standard	*Migratory Birds Convention Act and Regulations*	Any activities which could result in the mortality of migratory birds and endangered species and any species under federal authority	Canadian Wildlife Service, Environment Canada	Prohibits disturbing, destroying or taking a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird, and possessing a live migratory bird, carcass, skin, nest or egg, except when authorized by a permit. The Canadian Wildlife Service should be notified about the mortality of any migratory bird in the project area.
Municipalities				
Approval for Waste Disposal	*Urban and Rural Planning Act, 2000, and Relevant Municipal Plan and Development Regulations*	Waste disposal	Community Council	The use of a community waste disposal site in Newfoundland and Labrador by proponents/contractors to dispose of waste requires municipal approval. Restrictions may be in place as to what items can be disposed of a municipal disposal site.

Appendix B – Public Consultation Materials

Appendix B1: Project Introduction Presentation Provided to DFO, and

Appendix B2: Project Introduction Presentation to Town of Grand Falls - Windsor

Appendix B3: Meeting with Grand Falls-Windsor Town and Council, February 10, 2026

Appendix B1: Presentation to Fisheries and Oceans Canada, January 27, 2026

Goodyears Dam Life Extension Project

Project Overview

Safety Moment

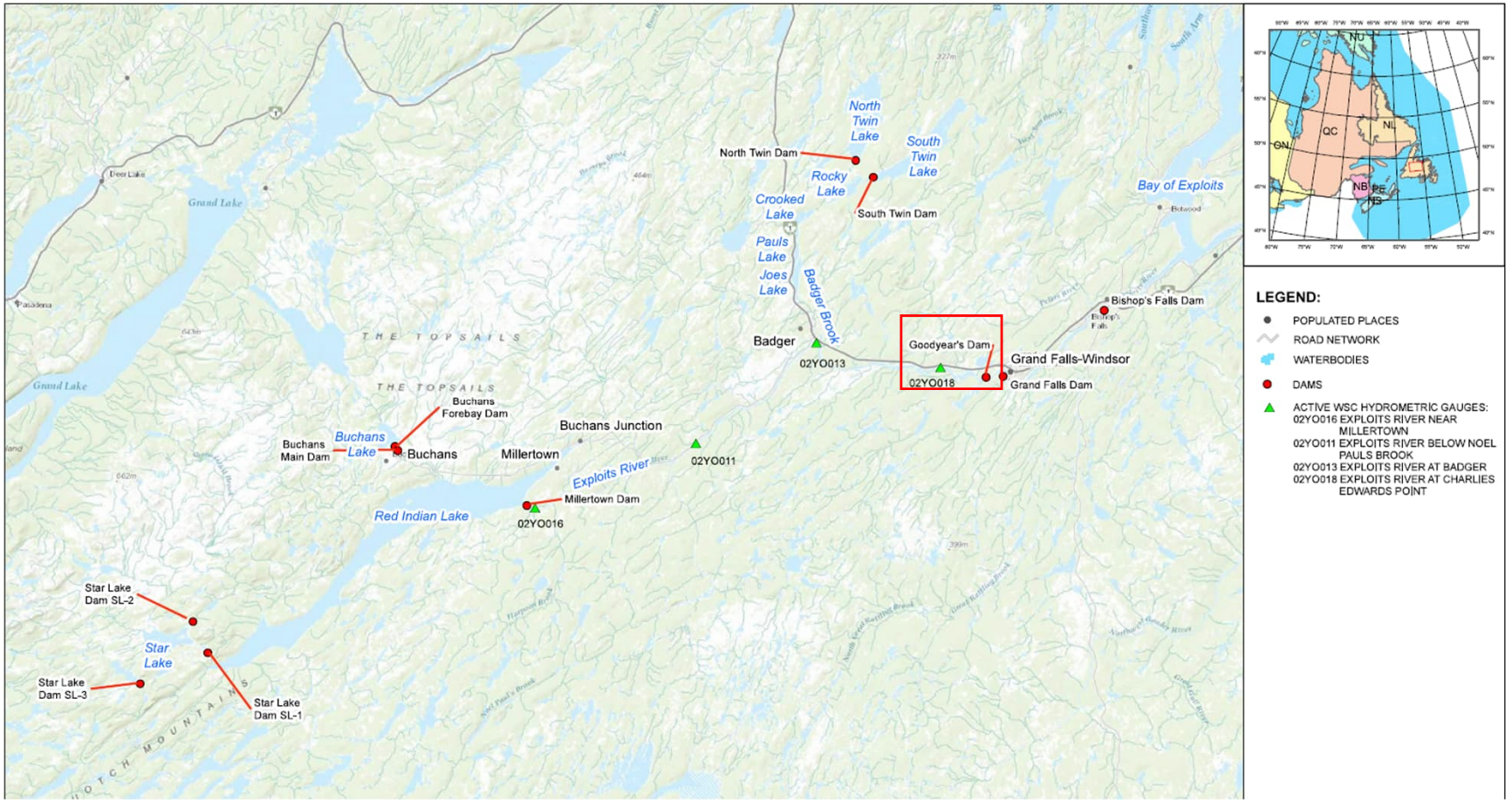
Emergency Preparation

- Always maintain a stocked emergency kit in your home
- Be prepared for power outages, having to leave your house unexpectedly, or other scenarios whereby you can’t access necessities such as food, water, heat, and light.
- Include:
- Non-perishable food items
- Bottled water
- Medications
- Flashlights/batteries/candles/lighter
- Emergency blanket/ change of clothes
- Check your kit annually to ensure items are not outdated and are okay for use

Agenda

- Introductions
- Background Information
- Project History
- Buttressing Design
- Fishway Design
- Construction Scope (2026-2028)
- Environment

Overview of Exploits System



- **NL Hydro manages and operates hydroelectric facilities on the Exploits River on behalf of the Provincial Government.**
- **The Exploits River system supports four NLH generating stations (Star Lake, Buchan's (not operating), Grand Falls and Bishop's Falls) and associated dams.**

Background on Goodyears Dam

- Originally constructed in 1911, ensures reliable winter operation at the Grand Falls Generating Station by slowing the water, and controlling frazil ice development.
- 2015 - approximately one third of the dam was breached, near south abutment, and emergency/temporary repairs were completed.
- Over the past 10+ years there have been signs of movement in the structure.
- Structure requires further life extension repairs to extend life by ~10 years.
- South fishway was infilled during 2015 repairs, north fishway is still operational.

Site Layout


N
TRANS CANADA HIGHWAY
TOWN OF GRAND FALLS
RUSHY BROOK
GRAND FALLS GOLF COURSE
GOODYEAR'S DAM NORTH ACCESS ROAD
FIRST FALLS
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RIPRAP SPILLWAY
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2015 Breach & Associated Repairs

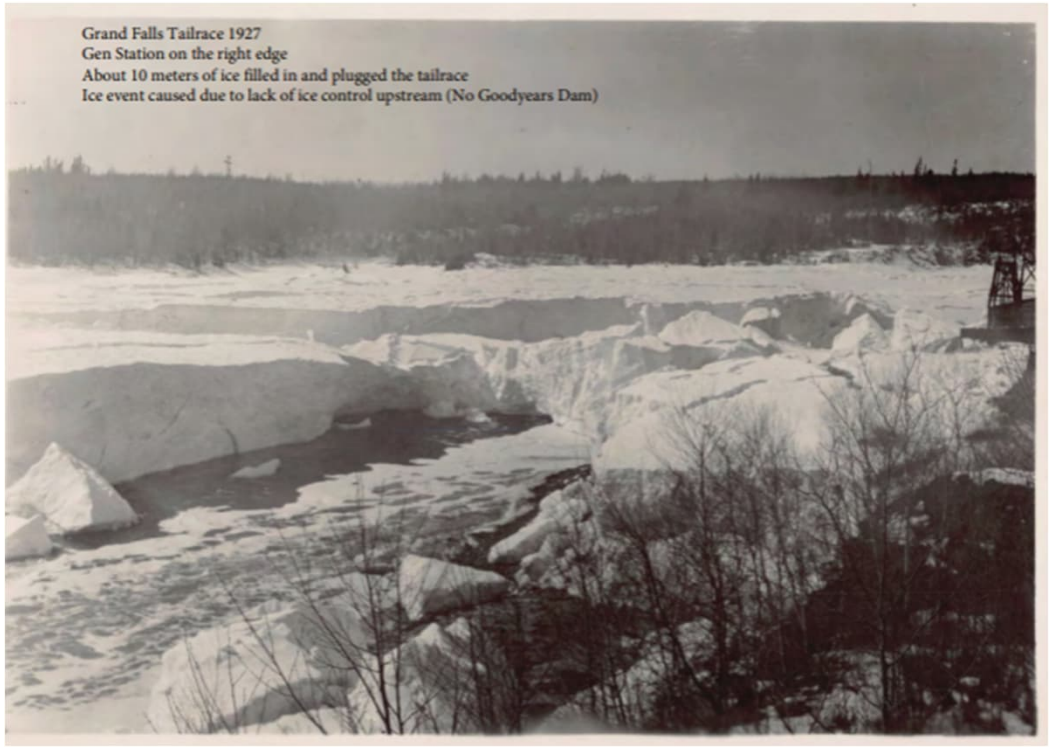
Two sections of timber crib failed

Repaired with large riprap

Current Condition

North Side of Structure

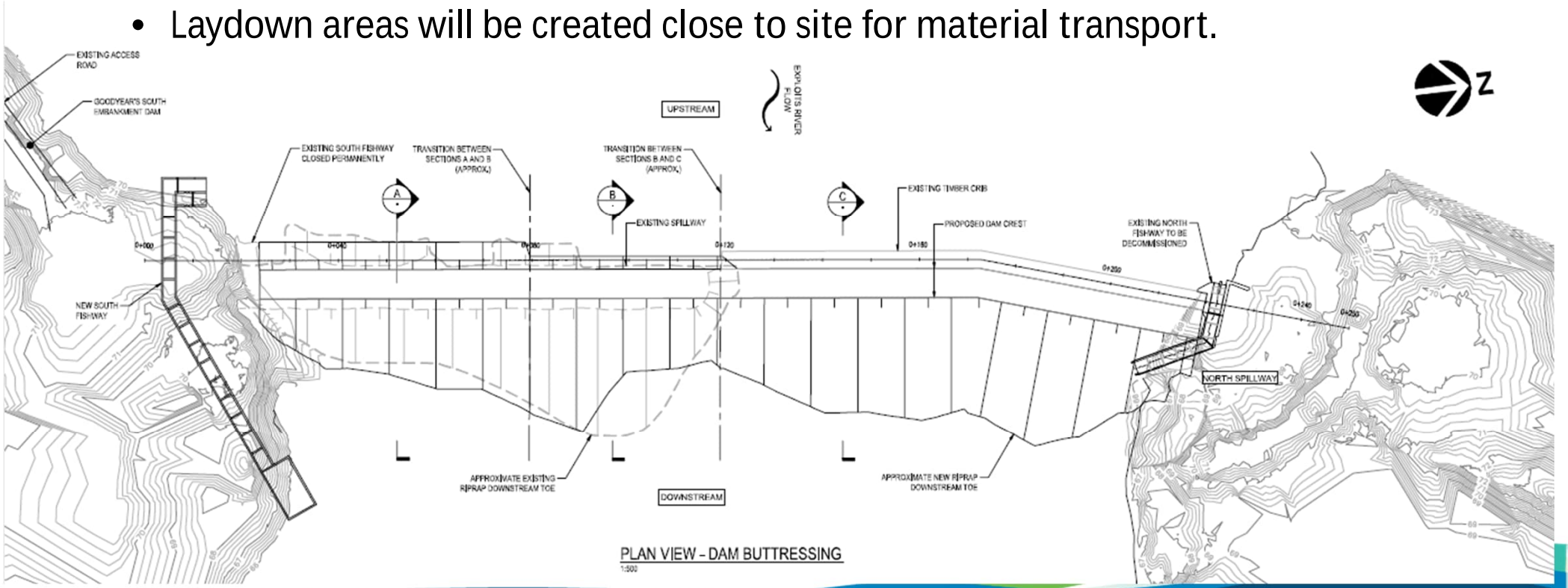
Project History



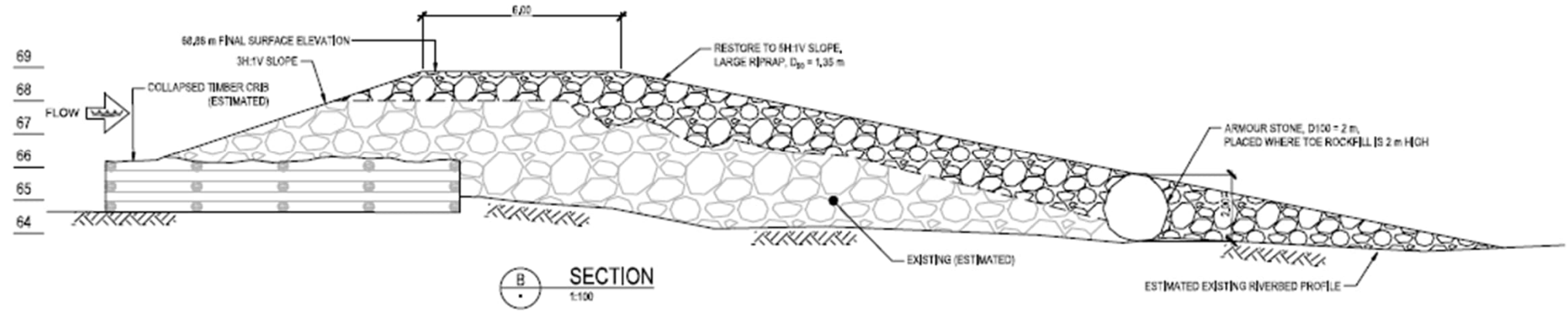
- An options analysis was completed in 2023 to determine best path forward for life extension
- Rockfill buttressing on the downstream side of the structure was chosen as the preferred option.
- Buttressing will extend beyond the north fishway outlet; fish passage options were also assessed.
- It was determined that a new fishway is required.
- Detailed Engineering commenced in 2024 and is ongoing into early 2026.
- An Environmental Assessment will be completed in 2026, public engagement occurring in January/February 2026

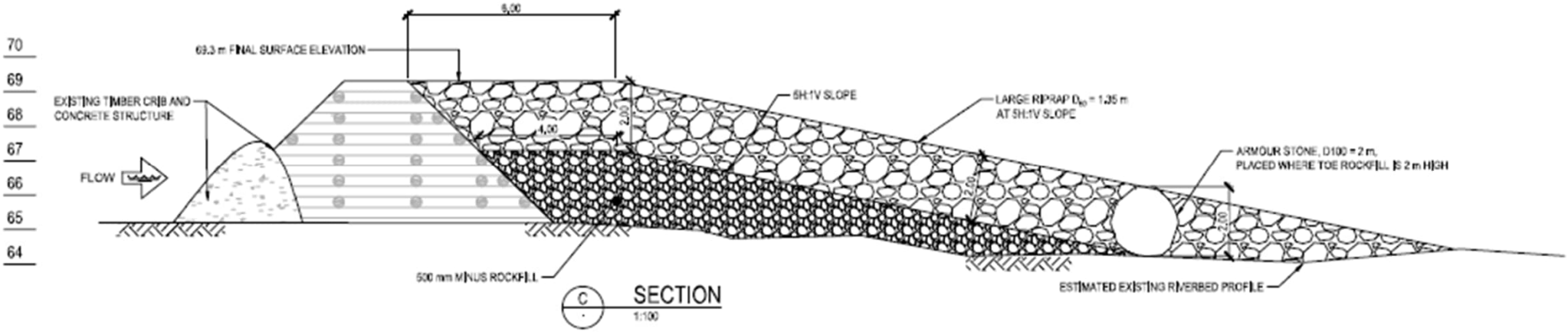
Buttressing Design

- Buttressing (reinforcing north and south sides) with large angular, durable rip-rap/ armor stone (D50= 1.35m).
- Core material (not subject to high loading) will be smaller, which will help with material availability.
- Slope: 5H:1V (stable, reduce likelihood of material movement under loading)
- Buttressing has been designed (through hydraulic modelling) to ensure upstream water levels will not be impacted.
- Laydown areas will be created close to site for material transport.



Buttressing Design





Fishway Design

- Options analysis for fish passage completed.
- Concrete vertical slot fishway, with 2.5m wide pools, metal grating, and enlarged entrance pool chosen.
- Designed for fluctuating upstream water levels, to ensure passage under all conditions.
- Auxiliary water system included to provide attraction flow at fishway entrance.
- Constructed in-land (blasting bedrock), prior to major buttressing activities.
- Create uninterrupted fish passage; available for monitoring during construction phases.

Construction Scope

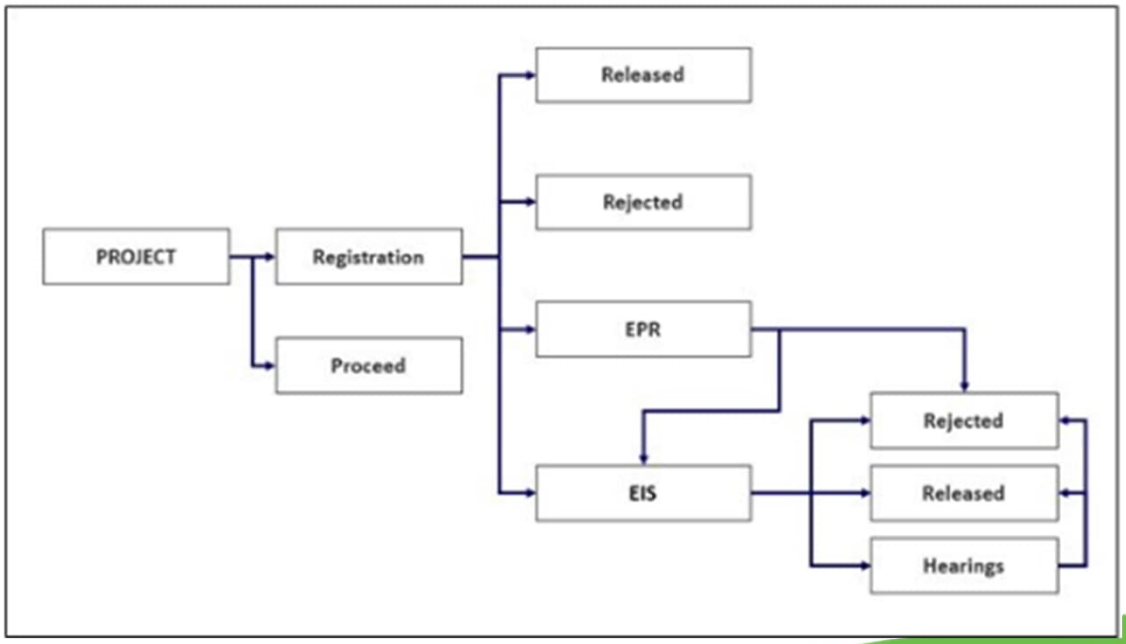
- In Year 1 (2026):
- Construct new fishway on the South side of Goodyears structure; construct lay down areas on both sides of the structure; and supply and stockpile rockfill material on site for buttressing. (over 10,000m^3 of material)
- In Year 2 (2027):
- Install rockfill buttressing on the downstream North side of the structure. Take north fishway out of service.
- In Year 3 (2028):
- Install rockfill buttressing on the downstream South side of the structure.

Environment - Mitigations

Project Activity	Mitigations
Engineering/ Planning	• New south fishway located inland • In-water work to occur outside salmon run (Sept-Oct) • Designed to allow for fluctuations in upstream water levels • Environmental Protection Plan • Environmental Assessment • Hydraulic model (to identify zone of hydraulic influence) • Permits
Construction	• South fishway to be constructed prior to buttressing (fish passage available during subsequent phases of construction) • Rockfill to be washed • Cofferdams – work in the dry for fishway • Permits • Water level monitoring • Construction Environmental Protection Plan • Waste Management and Emergency Management Plans • Water management (discharge channel) • Environmental Monitoring and Quality Control
Operations	• ISO 14001 Environmental Management System • Fish Passage Monitoring Program • Standard Operating Procedures • Routine Inspections and Maintenance

Environmental Assessment Process

- NLH is in the process of drafting an Environment Assessment registration package for review and release under the Newfoundland and Labrador Environmental Assessment process
- NLH will be submitting an enhanced package, as community engagement and consultation will be completed as part of the development
- Registration package to be submitted by the end of February
- Approximately 45 days after submittal for the decision



Fish Passage Monitoring Program

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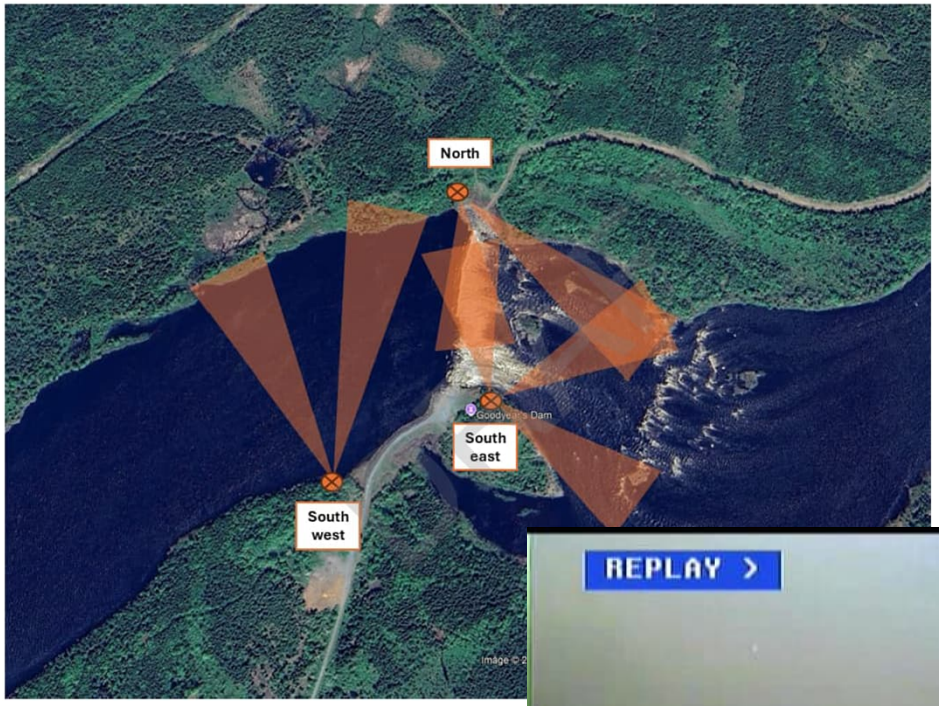
- Underwater video system and radio telemetry



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Appendix B2: Presentation to Town of Grand Falls-Windsor (NL), February 09, 2026

Goodyears Dam Life Extension Project

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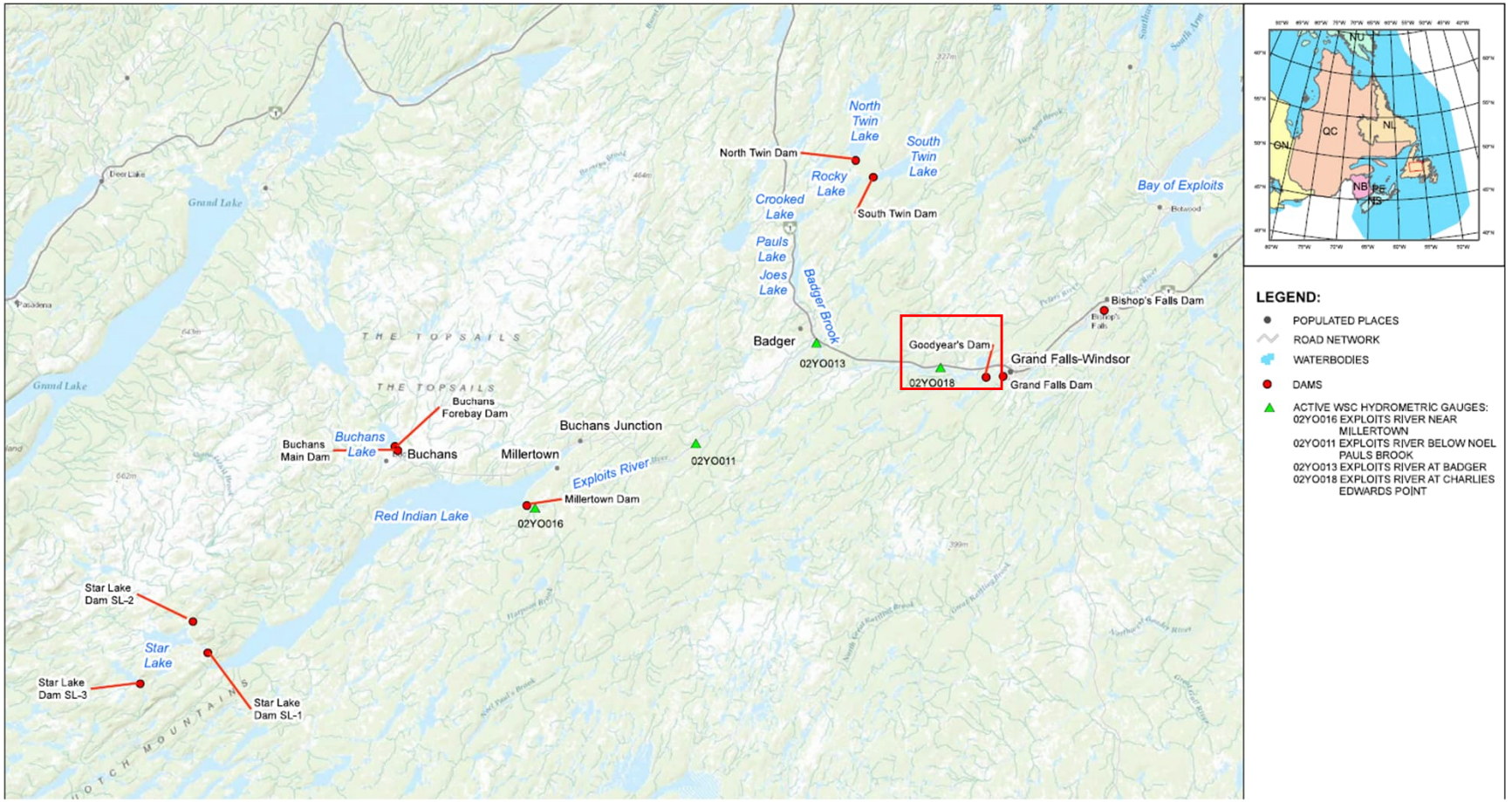

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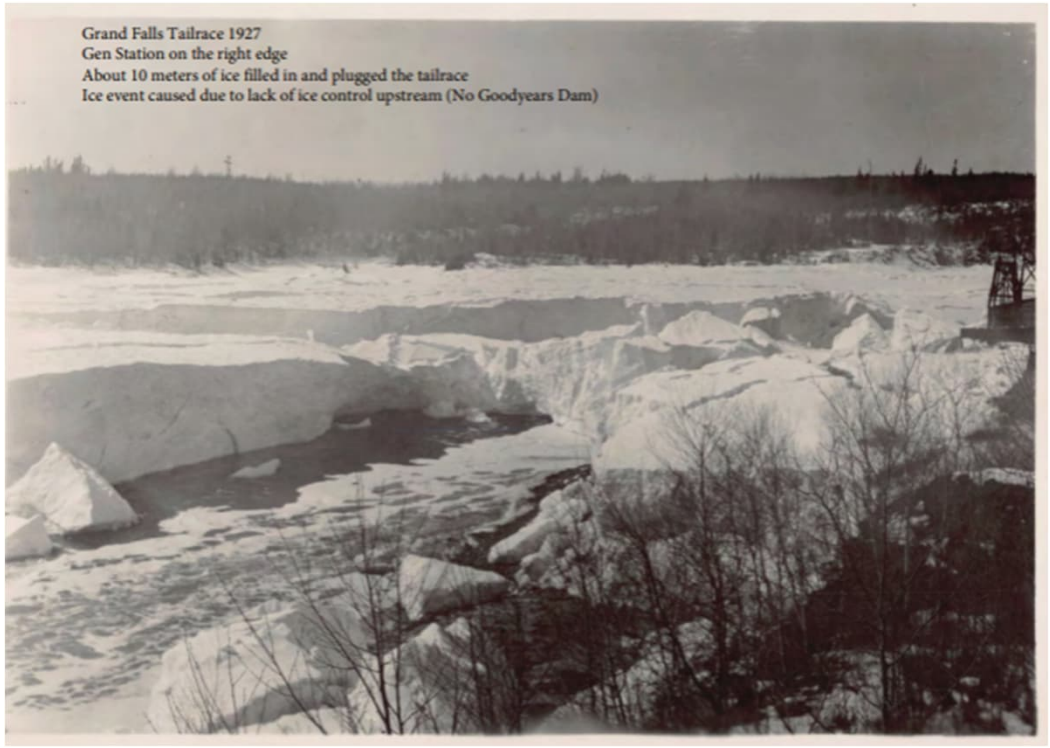

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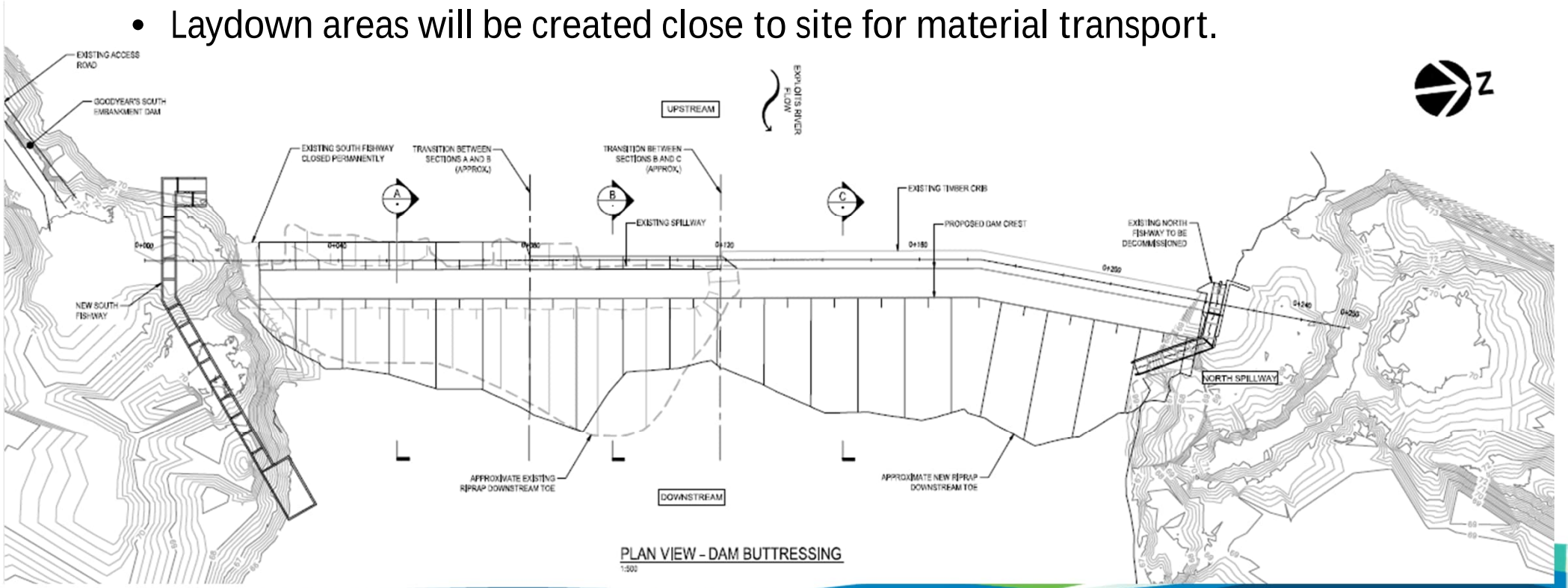

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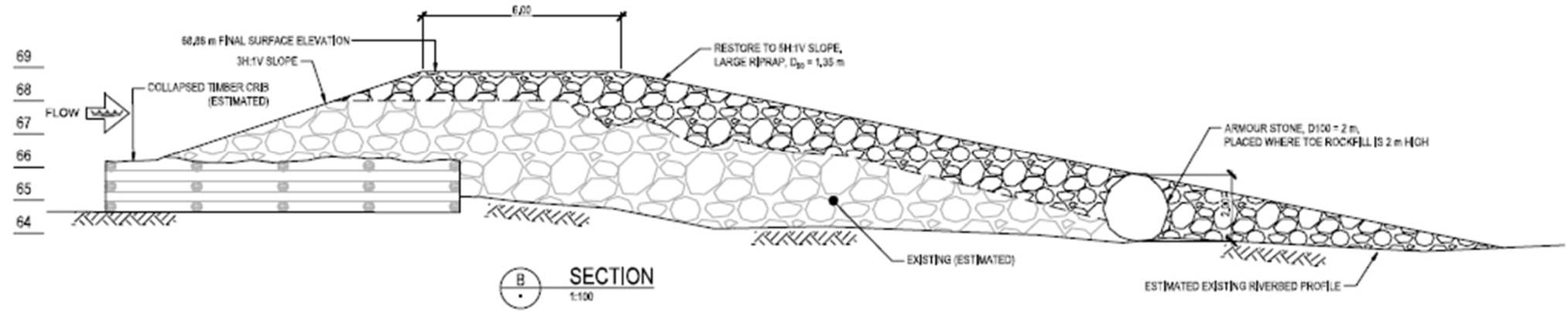

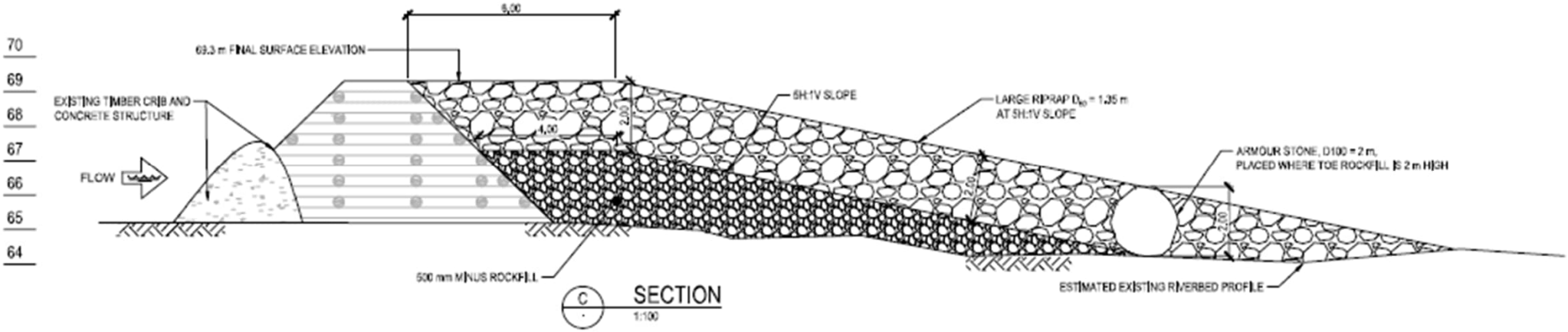

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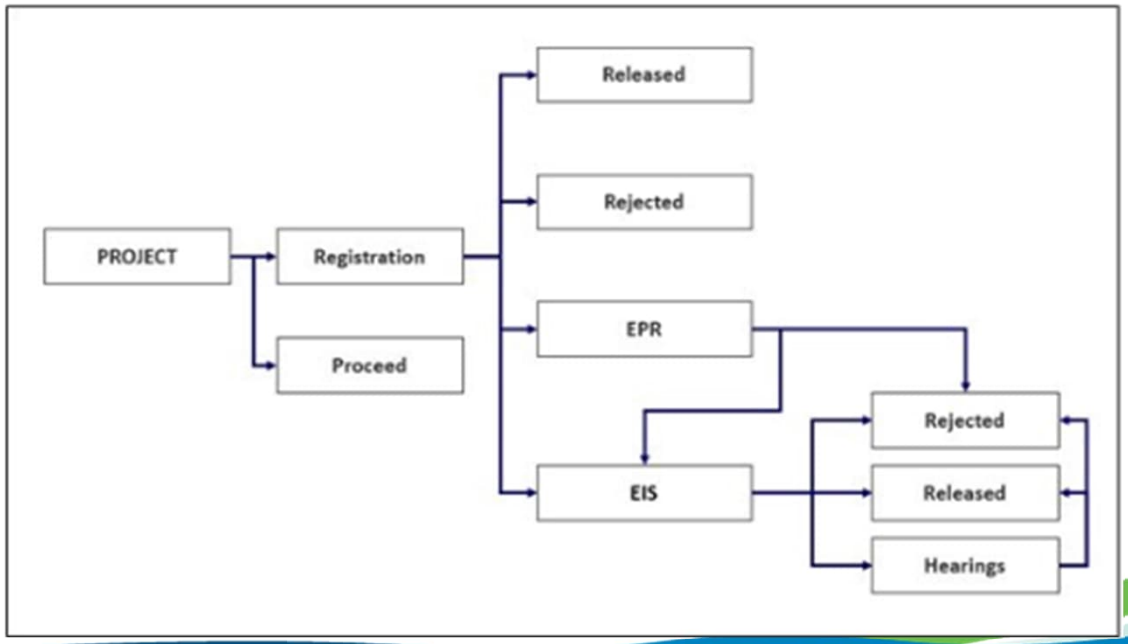
- Registration announced; written comments accepted
- Decision 45 days after submittal– will be announced in EA Bulletin



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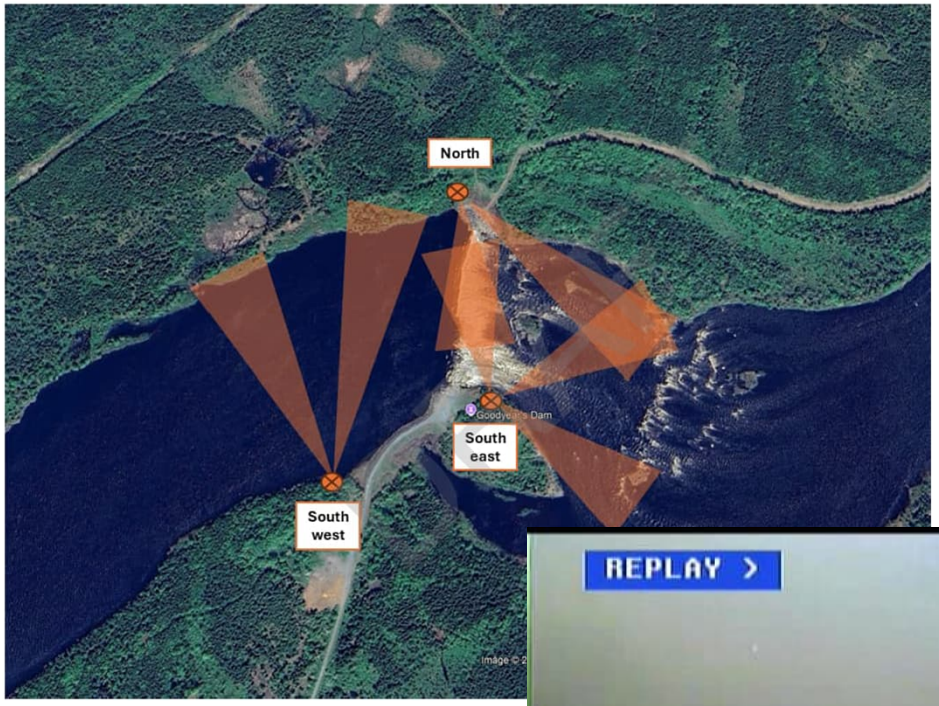

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Appendix B3: Minutes of Meeting: Grand Falls-Windsor Town and Council, February 10, 2026

Project Name: Goodyear's Dam Life Extension

Date/Time: 2026-02-10

Venue: Joe Byrne Arena, Grand Falls-Windsor

Title / subject: Community Engagement

Attendees: Grand Falls-Windsor Town and Council (GFW):

Mayor Mike Browne, Councilor Bob Hiscock, Councilor David Jones, Darren Finn (CAO), Robyn Winsor (Communications Officer), Todd Mercer (Director of Community Services)

NL Hydro (NLH) and WSP:

Deneen Cull, Brad Payne, Ashley Hobbs, Trevor Button, Karl Inkpen, Jared Remedios, Jim McCarthy (WSP), Kim Green (WSP)

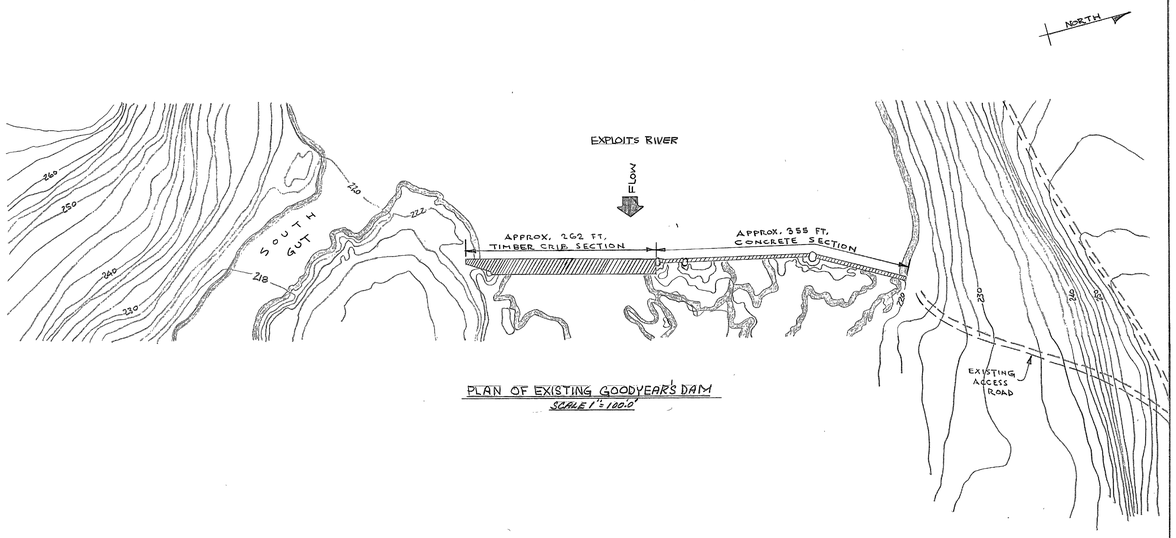
1	Introduction	All
2	Introduced purpose of meeting: • support stakeholder and Community engagement as part of project planning and the Environmental Assessment process. • NLH is hosting 2 public open houses at Mount Peyton Resort and Conference Centre on February 11, 2026, from 2:00 - 4:30 pm and 6:00 - 8:30 pm. • Open House details are also shared on the NLH website: Public Advisory: Open House Scheduled for Goodyear's Dam Life Extension Project – Newfoundland & Labrador Hydro)	NLH
3	Goodyear's Dam Life Extension project description: • Overview of the Exploits Generation System (Star Lake, Grand Falls, Bishop's Falls) • History of Goodyear's Dam (part of the Grand Falls Generating Station): - Constructed in 1911; south side fishway in 1974 and north side fishway in 1975; auxiliary spillway installed in 2003 - Emergency repairs completed in 2015 due to dam breach; resulted in infilling of the south fishway. Noted that salmon were still bypassing the dam via the breached areas, and the north side fishway • A Dam Safety Review (DSR) was completed in 2023 and determined that	NLH

	the dam was at risk of further deterioration and potential failure. A subsequent options analysis recommended buttressing to address structural deficiencies. • The purpose of the project is to extend the life of Goodyear's Dam for approximately 10 years. There will be no water level impact; crest level will be re-instated to original design. What is the plan after 10 years? • Long term options will be assessed for the structure. The current CDA classification may be conservative as per the latest DSR. Dam classification may be re-assessed to ensure the most cost effective approach is identified while still mitigating risks. This would impact design for any long term solutions.	GFW NLH
4	Fish Passage: • Fish passage options analysis was completed • The south fishway will be constructed in 2026; during this time the north fishwaywill remain in use to maintain uninterrupted fish passage. • The new south fishway will be operating for a year before the north fishway is decommissioned, to confirm functionality. Will salmon use new fish passage system? • Multiple fish passage systems were considered and the vertical slot design is the preferred option and is considered a more advanced approach for fishway design than the current pool and weir system. What is the schedule for the construction of the south fishway? Will it impact the salmon run? • Construction is primarily inland. There will not be any impact on the salmon run as all in-water works will be completed outside of sensitive fish migration periods.	NLH GFW WSP GFW NLH
5	Buttressing: • Has been designed to not impact upstream water levels • Detailed design is anticipated to be complete by March 2026. • Laydown areas on north and south sides of the dam to be prepared in 2026 • Buttressing core material and armour stone will start to be stockpiled at laydown areas in 2026. Increased truck traffic can be expected. • Buttressing will be completed over 2 years; north side in 2027, south side in 2028 What is core material? • Core material, which is not subject to loading, is smaller and therefore easier to source.	NLH GFW NLH

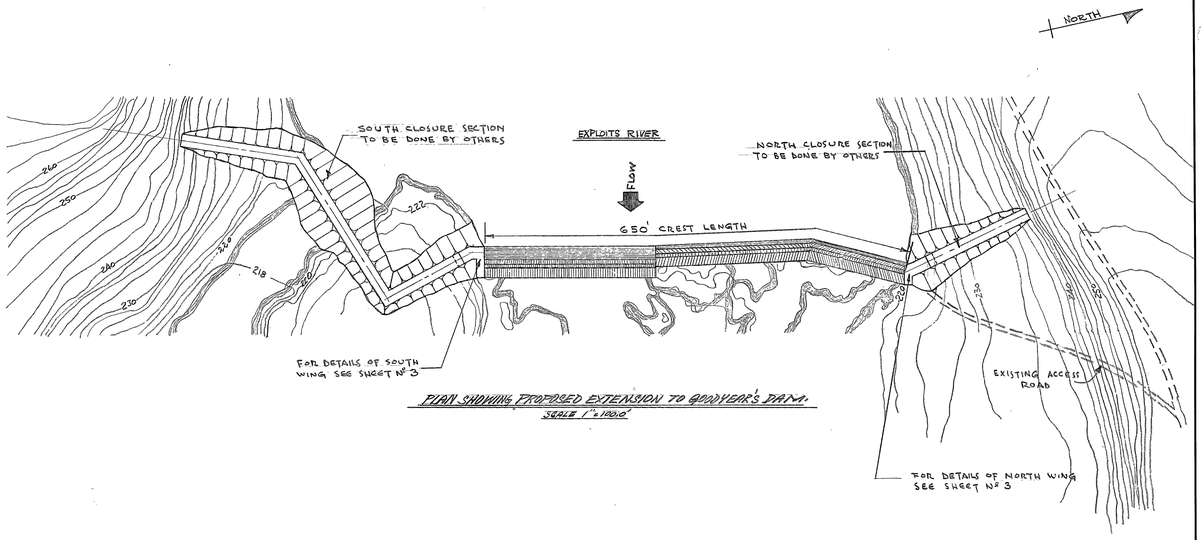
	Has Jumpers Brook been considered for armour stone supply?	GFW
	• Jumpers Brook is being considered, if approvals are in place.	NLH
	Will the project alleviate flooding in the community?	GFW
	• There will not be any impact on flooding.	NLH
6	Environmental Assessment: • EA is required (under Section 28. of the EA Regulations) as work will occur within 200 metres of the high-water mark of a scheduled salmon river • Anticipated submission, end of February 2026. Once submitted to DECCC, the project will be announced within 7 days and the 45 day review period commences. Comments will be accepted from the public during the first 35 days of this period. NLH will continue public engagement during this review period. • DFO will review the EA as well during this period. • It is anticipated that the project will be Released from further assessment, subject to Conditions identified by DECCC. • Upon release from EA process required permits and approval applications will be submitted to regulators (Water Resources Mgmt. Division, DFO, etc.) • Environmental protection measures will include: - Water level monitoring - Installation of coffer dams to allow work to be completed in the dry - Rockfill will be cleaned to avoid excess sedimentation - Contractor will be required to have a Waste Management, Environmental Protection and Water Management Plans in place. • The project will be completed in alignment with NLH's certified ISO 14000 Environmental Management System.	NLH
7	Fish Passage Monitoring Program: • The new vertical slot fishway on the south side will include an auxiliary water supply system at the fishway entrance to provide sufficient attraction-flow. • Primary objectives of the monitoring program are to assess the effectiveness of the new fishway, document fish movement patterns, and confirm regulatory compliance. • The monitoring program will use two methods: (i) radio telemetry and (ii) underwater video systems.	WSP
	Where will the fish be tagged? What if a tagged fish is caught?	GFW
	• Fish will likely be captured and tagged using the ERMA facilities, just downriver of Goodyear's Dam • If a tagged salmon is caught by an angler, contact information is included on the tag. • Anticipate 20-25 salmon will be tagged (actual number will be specified by	NLH/WSP

	DFO). Smaller fish will be targeted for tagging as it will be more difficult for them to get through the system than a larger fish. Tags are typically good for up to 2 years. • Length of monitoring program will be specified by DFO. Anticipated to be 5-7 years. • Noted that DFO currently has a tagging program on the Exploits River. • Reiterated that DFO permits cannot be issued until EA is released from the assessment process.	
8	Closing: • GFW noted that the presentation and information provided was clear, concise, and to the point. It was appreciated. • GFW also noted that they are willing to assist, if needed. • NLH thanked all participants for their time and feedback.	
	Meeting adjourned at 1:30 pm	

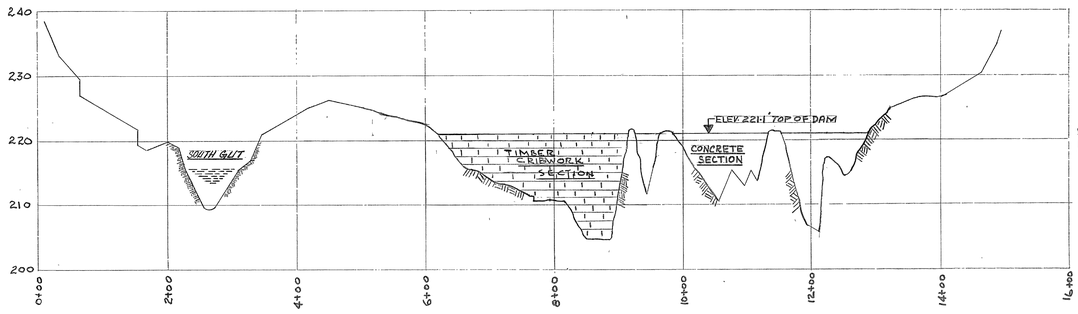
Appendix C – Original Dam Drawings (NLH 1969)



PLAN OF EXISTING GOODYEAR'S DAM
SCALE 1"=100.0'

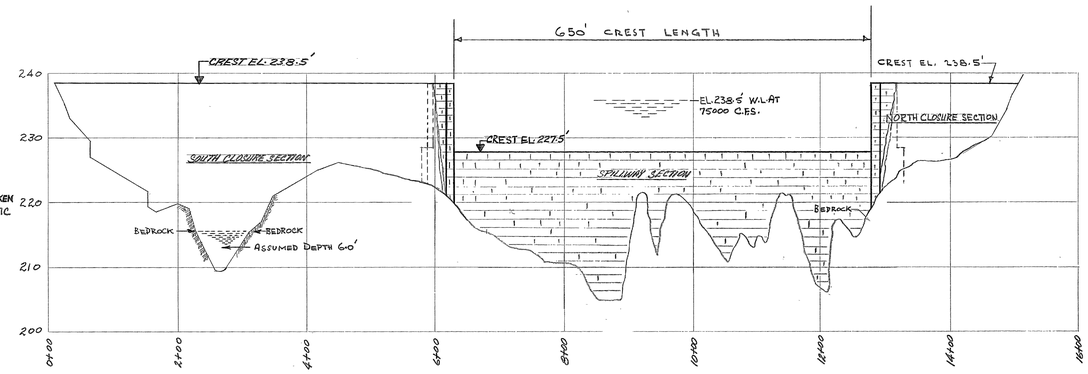


PLAN SHOWING PROPOSED EXTENSION TO GOODYEAR'S DAM.
SCALE 1"=100.0'

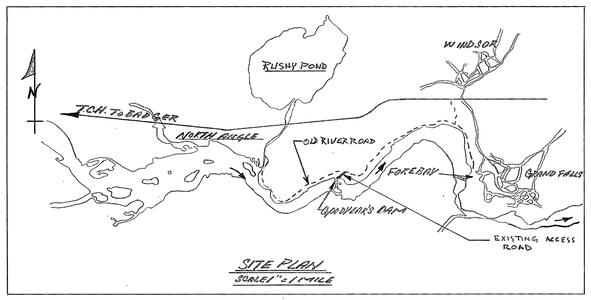


PROFILE OF RIVER BOTTOM SHOWING EXISTING DAM.
SCALE: HORIZ 1"=100.0' VERT. 1"=10.0'

ELEVATIONS TAKEN FROM GEODETIC DATUM.



PROFILE OF NEW EXTENSION (LOOKING UPSTREAM)
SCALE: HORIZONTAL 1"=100.0'
VERTICAL 1"=10.0'



SITE PLAN
SCALE 1"=1 MILE

TRC'D FROM SHAWMONT ENGR. DRAWING

PRICE (NFLD.) PULP & PAPER LIMITED
ENGINEERING DEPARTMENT
GRAND FALLS NEWFOUNDLAND

EXPLOITS RIVER - ICE CONTROL
EXISTING GOODYEAR'S DAM & PROPOSED EXTENSION

DATE: 6 NOV. 1969	JOB NO: 94-424
SCALE: AS SHOWN.	CHECKED:
DESIGN: TRC'D. T.A.	APPROVED:
DRAWING NO.	79D 9159 SHT. 1 OF 3

SHAWMONT ENGR. DRAWING															
DWG. NO.	REFERENCE	DWG. NO.	REFERENCE	DWG. NO.	REFERENCE	NO.	DATE	REVISION	NO.	DATE	REVISION	NO.	DATE	REVISION	

Appendix D – Stage 1 Historic Resources Assessment Goodyear's dam Replacement Project Exploits River Newfoundland and Labrador December 05, 2017

STAGE 1 HISTORIC RESOURCES ASSESSMENT
GOODYEAR'S DAM REPLACEMENT PROJECT
EXPLOITS RIVER
NEWFOUNDLAND AND LABRADOR

SUBMITTED TO:

Amec Foster Wheeler Environment and Infrastructure
133 Crosbie Road, P.O. Box 13216
St. John's, Newfoundland and Labrador
A1B 4A5

SUBMITTED BY:

Sikumiut Environmental Management Ltd.
Second Floor, 79 Mews Place
St. John's, NL
A1B 4N2

Archaeological Investigation Permit # 17.44
SEM Project # 003-014

December 07, 2017

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EXECUTIVE SUMMARY

In November of 2017, Sikumiut Environmental Management Ltd. (SEM) completed a Stage 1 Historic Resources Assessment on the Exploits River for NL Hydro's upcoming replacement of the aging Goodyear's Dam built in 1911 (the Project). The primary objectives of the study were to identify and assess the historic resources / archaeological potential or sensitivity within the Project Area and recommend the appropriate methodology and scope for further detailed impact studies in Stage 2, if indicated.

Background research for the study suggested that the historic resources / archaeological potential of the Project Area was likely Low. This conclusion derived from the fact that large segments of the shoreline and adjacent terrestrial areas where any extant archaeological materials would most likely have been situated appeared (from Project mapping, aerial imagery and aerial photography analysis), to have experienced substantial disturbance from past construction and maintenance of the dam and access roads, and from inundation and ice-scouring of the shoreline following construction of the dam in 1911 and creation of the upstream reservoir. An additional finding of the background research was information regarding one relatively recent archaeological site recorded in 1992 on the north shoreline of the Exploits River approximately 200 m downstream of the dam. This site, registered with the Provincial Archaeology Office as DfAw-11 - Goodyear's Dam 1, consisted of a small boulder alignment thought to be a footing or building foundation, likely dating to the 19th or 20th century and possibly used for logging, hunting, fishing and/or trapping activities. If the position of the find described on the Archaeological Site Record Form is generally accurate, this would place the site outside the current Project Area by at least 70 m. Consequently, no direct Project-related interactions are anticipated.

The field study for the Stage 1 Assessment involved an investigation of six discrete study areas and the monitoring of four mechanically excavated, geotechnical test-pits. Despite a thorough visual inspection of each Area and excavation of 186 shovel test-pits, no historic resources / archaeological materials were identified at any location (including at the geotechnical test-pits), and the potential for any to be encountered within the Project Area during future construction and operation is considered Low due to the disturbance factors described above (*i.e.*, past construction-related ground disturbance and the resulting inundation and ice-scouring of the shoreline). While two of the four geotechnical test-pits were situated well back from the shoreline in undisturbed wooded areas, they were positioned on sloping terrain exceeding that which would normally be suitable for human settlement. Regarding the registered archaeological site DfAw-11, despite a thorough search of the shoreline where it was reported to be located, no evidence of it was found.

In conclusion, other than the development of an Environmental Protection Plan outlining procedures to follow in the event any historic resources / archaeological materials are inadvertently unearthed or otherwise encountered by workers during any stage of the Project (which could include the site DfAw-11), no specific mitigation measures or further detailed impact studies (*e.g.*, Stage 2) are warranted or recommended.

1.0 BACKGROUND

1.1 Project Area

Newfoundland and Labrador Hydro (NL Hydro), a Nalcor Energy Company, in association with its primary consultant Amec Foster Wheeler Environment and Infrastructure (AFWEI), is preparing to replace Goodyear's Dam (the Project) situated on the Exploits River approximately 4 km west of the community of Grand Falls-Windsor, Newfoundland and Labrador (NL). Originally built in 1911 by the Anglo Newfoundland Development Company to regulate water and ice-flow in the river, preparatory ground-work required for replacement of the old wood and stone structure will involve tree and brush clearing, surface grubbing, excavation of the existing ground, and removal of a quantity of the underlying bedrock. The Goodyear's Dam Project Area is shown on Figure 1.1 below.

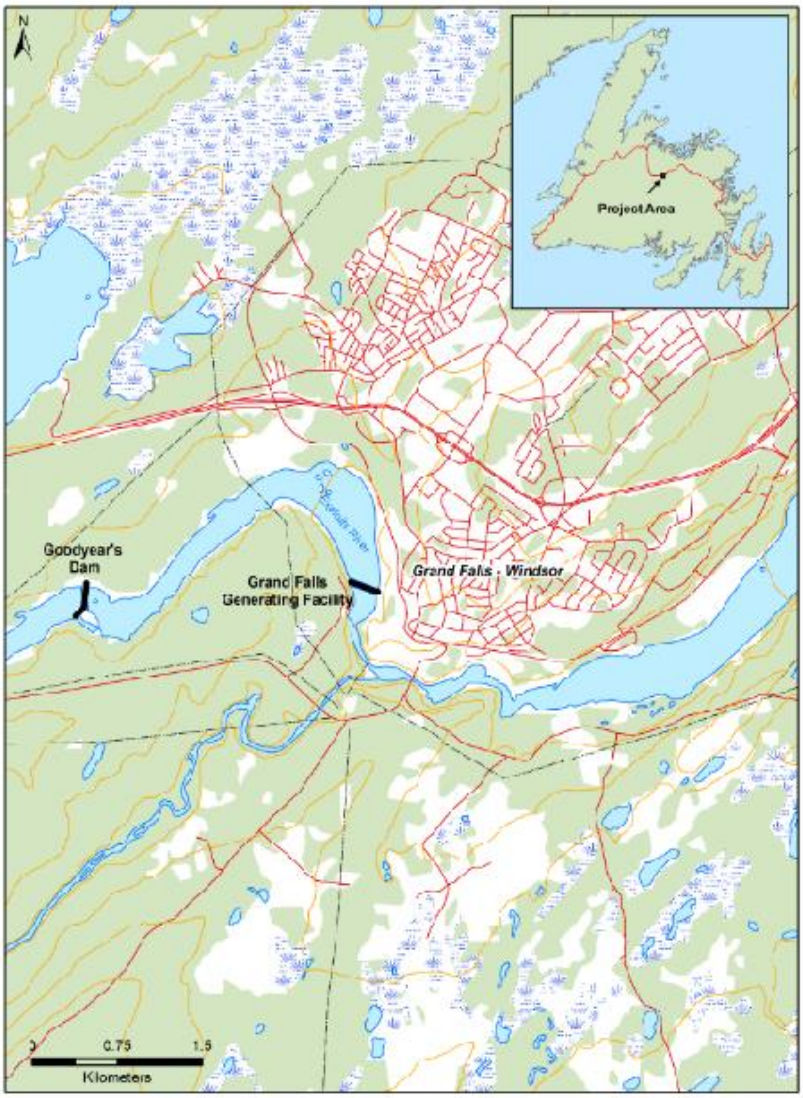

Figure 1.1. Goodyear's Dam Project Area (AWFEI image)

1.2 Physical Features of the New Dam

Replacement of the dam will include construction of a new concrete overflow spillway a short distance downstream of the existing timber crib and rockfill spillway, and a new concrete sluicegate structure downstream of the existing south closure dam. The new dam will span approximately 200 m north to south, with a portion of the length extending onto the shoreline on either side of the river. The overall physical layout of the new dam and the associated infrastructure, and how it relates to the adjacent terrain, is shown in Figure 1.2 below.

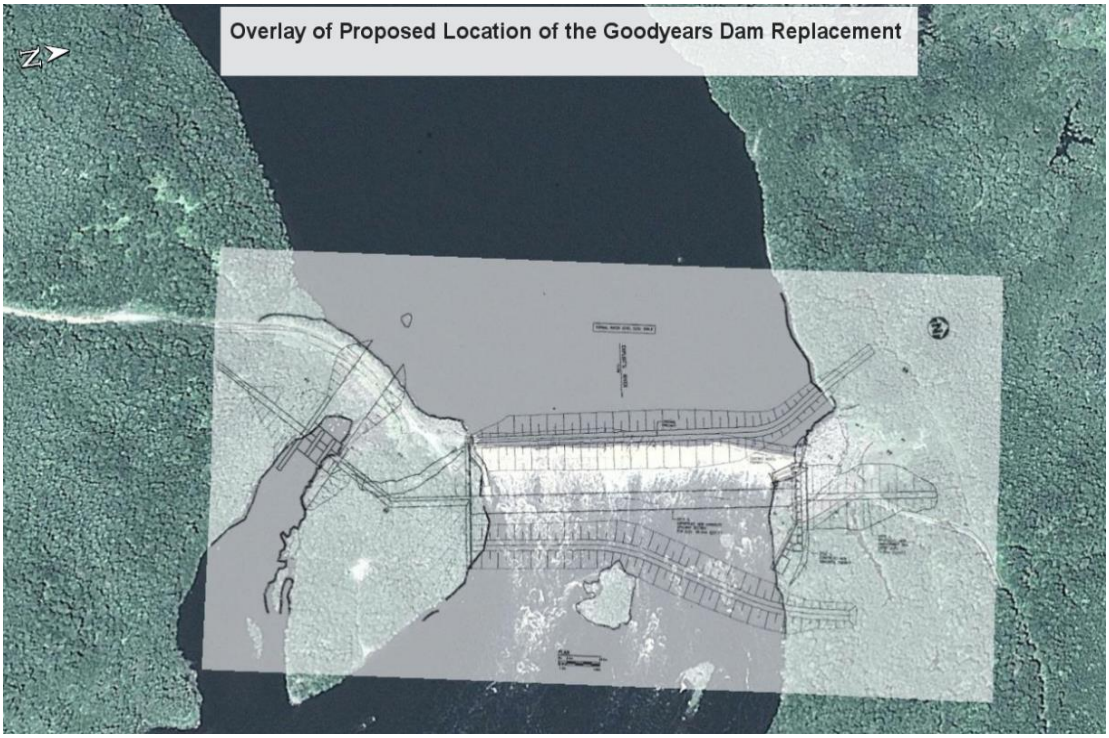

Figure 1.2. Physical Layout of the New Goodyear's Dam (AWFEI image)

1.3 Rationale for Stage 1 Historic Resources Assessment

Since 1960, several historic resources assessments and directed archaeological research projects have been completed along the Exploits River waterway, resulting in the identification of a long-standing record of interior settlement and land-use by Indigenous and non-Indigenous peoples during the Pre-contact and Historic Periods (Schwarz 1992). Even though a previous archaeological survey did encompass the current Project Area, and resulted in the discovery of one relatively recent archaeological site approximately 70 m outside of it downstream of the dam (Schwarz 1992), there still existed the possibility that historic resources / archaeological materials deriving from one or more of the documented occupations may be extant within the Project Area and could be impacted during the upcoming construction activities. Consequently, NL Hydro, in consultation with Provincial Archaeology Office (PAO) of the Department of Tourism, Culture, Industry and Innovation, concluded that as a matter of due diligence, a Stage 1 Historic Resources Assessment (Stage 1 Assessment) would be completed prior to commencement of any ground-disturbing construction activities.

In NL, and within Canada generally, the term Historic Resources includes archaeological sites and materials predating AD 1960. Artifacts defined as archaeological can date to the Pre-contact or Historic Periods and typically include items such as stone tools and chipping debris (flakes), the remains of cobble hearths, ceramics and glass, or various types of metal and organic objects. Historic Resources can also comprise certain types of built-heritage such as historic properties, buildings and structures, as well as landscapes and/or landscape-features that exhibit evidence of use or modification by humans that is considered culturally or historically significant.

The Pre-contact Period refers to the time prior to the arrival of Europeans in North America *circa* AD 1500 and “contact” with Indigenous peoples. The Historic Period refers to the time following contact and the beginning of written records in the “New World”. Current regulatory policy for the province of NL sees the Historic Period continue until *circa* AD 1960.

2.0 STAGE 1 HISTORIC RESOURCES ASSESSMENT

2.1 Objectives

In accordance with the guidelines for historic resources research in the province of NL (*Historic Resources Act* 1985; Government of Newfoundland and Labrador 1992), the primary objectives of the Goodyear's Dam Replacement Project Stage 1 Assessment were to:

- identify and assess the historic resources / archaeological potential or sensitivity within the Project Area; and
- recommend the appropriate methodology and scope for further detailed impact studies in Stage 2, if indicated.

2.2 Research Plan and Methodology

Completion of the Stage 1 Assessment involved three key tasks: a) background research and submission of an Archaeological Investigation Permit Application to the PAO; b) a field study; and c) preparation of the required reporting on the work in accordance with the guidelines detailed in the provincial Historic Resources Assessment and Impact Management Summary (Government of Newfoundland and Labrador 1992). The structure of each task is outlined below.

2.2.1 Background Research

Background research for the Stage 1 Assessment involved a review of published sources that discuss in detail the history, settlement patterns, and artifact types and structures usually associated with the Beothuk during the Historic Period (Howley 1915; Marshall 1996). Historic maps and site descriptions contained in these publications were examined to determine the likelihood that sites related to this cultural group might be located within or close to the Goodyear's Dam Project Area.

Additionally, literature discussing the previous historic resources and archaeological research projects undertaken along the Exploits River in vicinity of the Project Area and within the central Newfoundland interior generally were reviewed (Devereux 1965; Gilbert 1996; LeBlanc 1973; Madden 1975; Thomson's 1981, 1983; McLean 2014a, 2014b, 2015 a, 2015b, 2016a, 2016b, 2016c, 2016d; Schwarz 1992). The Newfoundland and Labrador Archaeological Site Record Inventory and Site Record Forms on file at the PAO were also examined to obtain details regarding the number, location and cultural affiliation of the archaeological sites registered with the province for the Exploits River within a 5 km-radius of the Project Area.

In addition to the above, the Project Archaeologist spoke with one informant from Grand Falls-Windsor, Mr. Donald Pelley, a retired outfitter. Don had previously worked with Archaeologists Ken Reynolds and Laurie McLean on various archaeological research projects and historic resources assessments on the Exploits River. He was asked for information regarding whether

he knew of any archaeological materials located at or close to Goodyear's Dam within the current Project Area.

Current aerial imagery and topographic maps of the Project Area were also reviewed to help target, for subsequent field investigation, any landforms or vegetation patterns that appeared to hold potential for archaeological sites, as well as any zones that appeared to have undergone previous ground disturbance and where detailed field investigation may not be warranted.

A key source of information used to help establish the extent to which the shoreline of the Exploits River within and upstream of the Project Area has changed since construction of the dam in 1911, and the potential impacts this may have had on any extant archaeological sites, included a review of the earliest, best quality "historic" aerial photographs on file Air Photo and Map Library (APML) at the Howley Building in St. John's, NL, that show the configuration of the watercourse in 1946. Though the photographs were taken some 35 years after construction of Goodyear's Dam, the topographic information acquired from them was compared with the current aerial imagery of the river to better understand the extent of shoreline inundation and how this may have affected the overall archaeological potential of the Project Area.

2.2.2 Field Study

Due to the extent of ground disturbance near the existing dam caused by the initial construction in 1911 and from the subsequent maintenance and upgrading, it was established, in consultation with AFWEI and the PAO, that the field study for the Stage 1 Assessment should focus on only the Areas listed below and shown in Figure 2.1, including:

- a parcel of ground approximately twice the size as that shown for the *Laydown Area Used For Goodyear's Emergency Work in 2015* (referred to as Area 1);
- the *Areas to be Cleared for Construction* (referred to as Areas 2 and 5);
- the *Areas to be Excavated to Bedrock* (referred to as Area 3);
- the full length of the *Trail to be Developed* on the north side of the river; and
- the terrain between the *Trail to be Developed* and the shoreline of the Exploits River (referred to as Area 4).

The field study for the Stage 1 Assessment was conducted by a three-person team (two excavating test-pits), and involved a walk-over and thorough visual inspection of all six Areas listed above (including the proposed trail on the north side of the river), and subsurface shovel testing of all undisturbed locations thought to have potential for historic resources. Where appropriate, two rows of shovel test-pits, spaced approximately 5 m apart and measuring in the order of 30 cm x 30 cm, were dug at 5 m or random intervals paralleling the shoreline and at any relatively level and well-drained terrain back from the water that appeared suitable for human settlement.

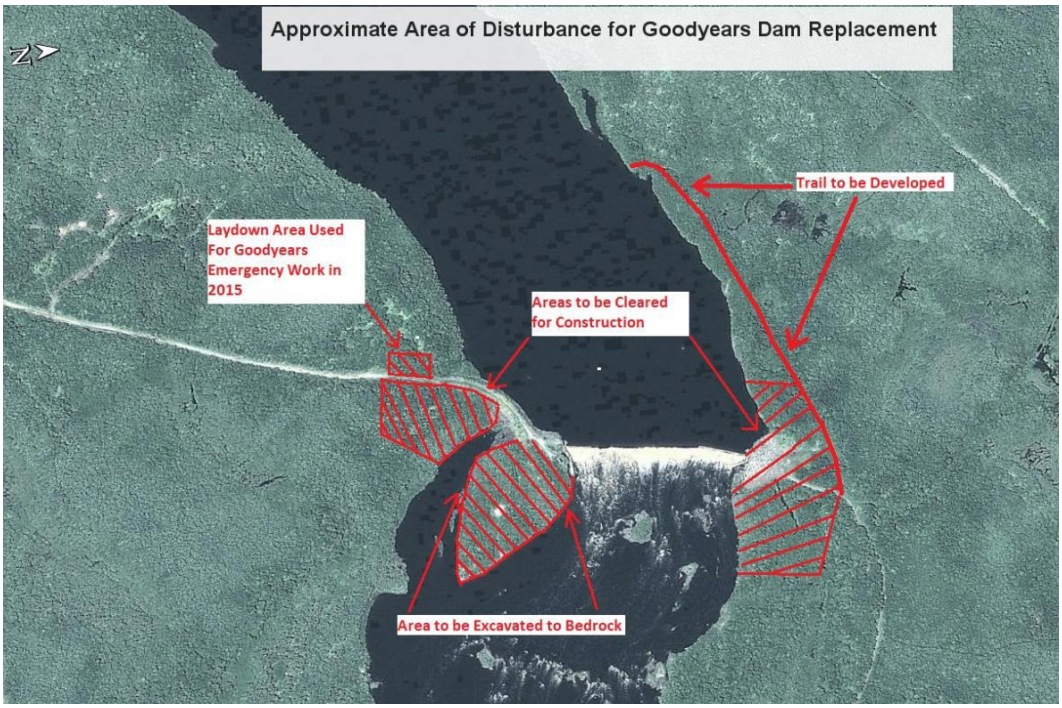

Figure 2.1. Project Area Showing the Study Areas (AFWEI image)

Typically, the study team walked and visually examined the shoreline of each of the five study Areas for the presence of artifacts and any other cultural materials of significance, and then returned walking two parallel tracks spaced approximately 5 m apart and, depending on the nature of the terrain, either 5 or 10 m back from the water's edge. GPS coordinates were taken at the start and finish of each testing location (including along the corridor of the New Proposed Trail), and the number of test-pits dug was recorded. Photographs were taken of each study Area and fieldnotes were maintained on the nature of the topography, the ground-surface and soil conditions observed, and the overall vegetation coverage. Comments were written on whether the current state of the environmental elements mentioned above suggested that disturbance or alterations to the terrain had occurred due to past construction or logging activities, or from seasonal flooding and ice-scouring caused by fluctuating water-levels in the reservoir following the damming of the river in 1911.

In addition to the visual investigation and broad-based shovel test-pitting of specific locations within the Project Area, during the Stage 1 Assessment field study, AFWEI contracted the excavation of four geotechnical test pits, with two positioned on the south side of the river and two on the north. Immediately prior to any excavation, which was completed using a large tracked excavator, the Project Archaeologist visually investigated each target area and, if warranted, dug shovel test-pits to determine if archaeological materials or features were present. The geotechnical excavations were then monitored to ensure that no materials of significance were unearthed and, once concluded, the mechanical excavations were backfilled and the ground was restored as close as possible to its former state.

2.2.3 Reporting

This Report has been prepared in accordance with the provincial guidelines for historic resources research in the province (Government of Newfoundland and Labrador 1992), and includes a discussion of the methods and techniques used, figures and photographs showing the various study Areas, and a summary of all study results. Bibliographic references for all sources and individuals consulted are included, and a recommendation is made for the development of an Environmental Protection Plan for historic resources that would highlight the procedures to follow if any archaeological materials or features are encountered inadvertently by site workers during any stage of the upcoming construction project and the subsequent operation and maintenance of the new dam.

2.3 Archaeological Permitting

The field study for the Stage 1 Assessment was conducted over a four-day period between November 19 and November 22, 2017, under the PAO Archaeological Investigation Permit # 17.44. In accordance with the Archaeological Investigation Permit requirements, the locations of all test-pit clusters and the tracks walked and investigated within the Project Area were recorded using a hand-held GPS unit. This information, along with a copy of the transcribed and typed notes, and the photographs taken during the field study, will be submitted to the PAO.

2.4 Study Team

Roy Skanes was the Project Archaeologist for the Stage 1 Assessment. Roy has worked as a Consulting Archaeologist for the past 27 years and has been involved in archaeological and related background research since 1978. He has worked extensively in Newfoundland and Labrador, Nova Scotia, Prince Edward Island, New Brunswick, Quebec, Ontario and Alberta, and holds a B.A. in Anthropology (Archaeology and French) from Memorial University of Newfoundland and a Masters degree with a specialization in archaeology from the University of St. Andrews, Scotland. Since 1990, he has completed several projects of similar scope and depth to the current Stage 1 Assessment and is qualified to hold an Archaeological Investigation Permit in the province of Newfoundland and Labrador.

Assistance with the field study was provided by Geotechnical Engineer Andrew Guest of AFWEL and Jeff Ivany of NL Hydro, based in Grand Falls-Windsor.

3.0 STAGE 1 ASSESSMENT RESULTS

3.1 Background Research

Results of background research, including the literature and Archaeological Site Record Form review, informant interview, and the current aerial imagery, topographic mapping, and historic aerial photograph analysis are presented below.

3.1.1 Literature and Archaeological Site Record Form Review

No specific reference is made in either principal publication on the Beothuk that the area at or adjacent to Goodyear's Dam had been used for harvesting and/or settlement during the Historic Period (Howley 1915; Marshall 1996). Though it is likely that Beothuk would have travelled through the area following the course of the Exploits River, possibly on a seasonal basis while moving to and from the coast to the interior, no mapping or reference was found that related specifically to the current Project Area.

Since the early 1960s, several historic resources assessments and directed archaeological research projects have been completed along the Exploits River waterway and throughout the region generally. Much of this work was directed toward establishing an accurate understanding of the chronology and specific aspects of the occupation and settlement patterns of interior Newfoundland during the Pre-contact and Historic Periods by Indigenous peoples (Devereux 1965; LeBlanc 1973; Madden 1975; Thomson 1981, 1983). Additionally, several of the historic resources assessments were of a salvage nature that involved the excavation of sites that were threatened from shoreline erosion and other uncontrollable aspects of environmental damage (McLean 2014a, 2014b, 2014c, 2016b, 2016c). One project, which was certainly the most extensive survey of the river undertaken thus far, was conducted by Dr. Fred Schwarz in 1992 and focused on surveying the region referred to as the Exploits Basin. Over the course of that work numerous linear kilometers of river frontage and shoreline between the northeastern end of Red Indian Lake and the inner reaches of the Bay of Exploits were walked, visually investigated, and test-pitted. During that project, which involved two focused research teams working various parts of the study area simultaneously, a total of 51 archaeological sites were identified and recorded, of which 34 were previously unknown (Schwarz 1992).

Information obtained from archaeological reports and the Archaeological Site Record Forms provided by the PAO indicated that within a 5 km-radius of Goodyear's Dam there are a total of 15 registered archaeological sites, including evidence of Pre-contact Period Indigenous occupations (*e.g.*, possible Maritime Archaic Indian, Groswater Palaeoeskimo, Dorset Palaeoeskimo, Little Passage Complex peoples[1] / proto-Beothuk), as well as Historic-Period Beothuk and possible Mi'kmaq material culture (McLean 2014a; McLean 2014b; McLean 2014a; McLean 2015b; McLean 2016a; McLean 2016b; McLean 2016c; McLean 2016d;

[1] "The term "complex" is used by archaeologists to describe a pattern of similar tools used throughout a region over a period of time, particularly when comparatively little is known about the people who produced those tools." (Taken from: *The Recent Indians of the Island of Newfoundland*. http://www.heritage.nf.ca/articles/aboriginal/recent-indians.php).

Schwarz 1992). Sites thought to be related to the recent Euro / Newfoundlander presence have also been recorded. Most of the 15 registered sites are situated to the west of Goodyear's Dam near Boom Island and on the mainland to the south of Rushy Pond, and on Rushy Brook that empties from the pond into the Exploits River (Figure 3.1).

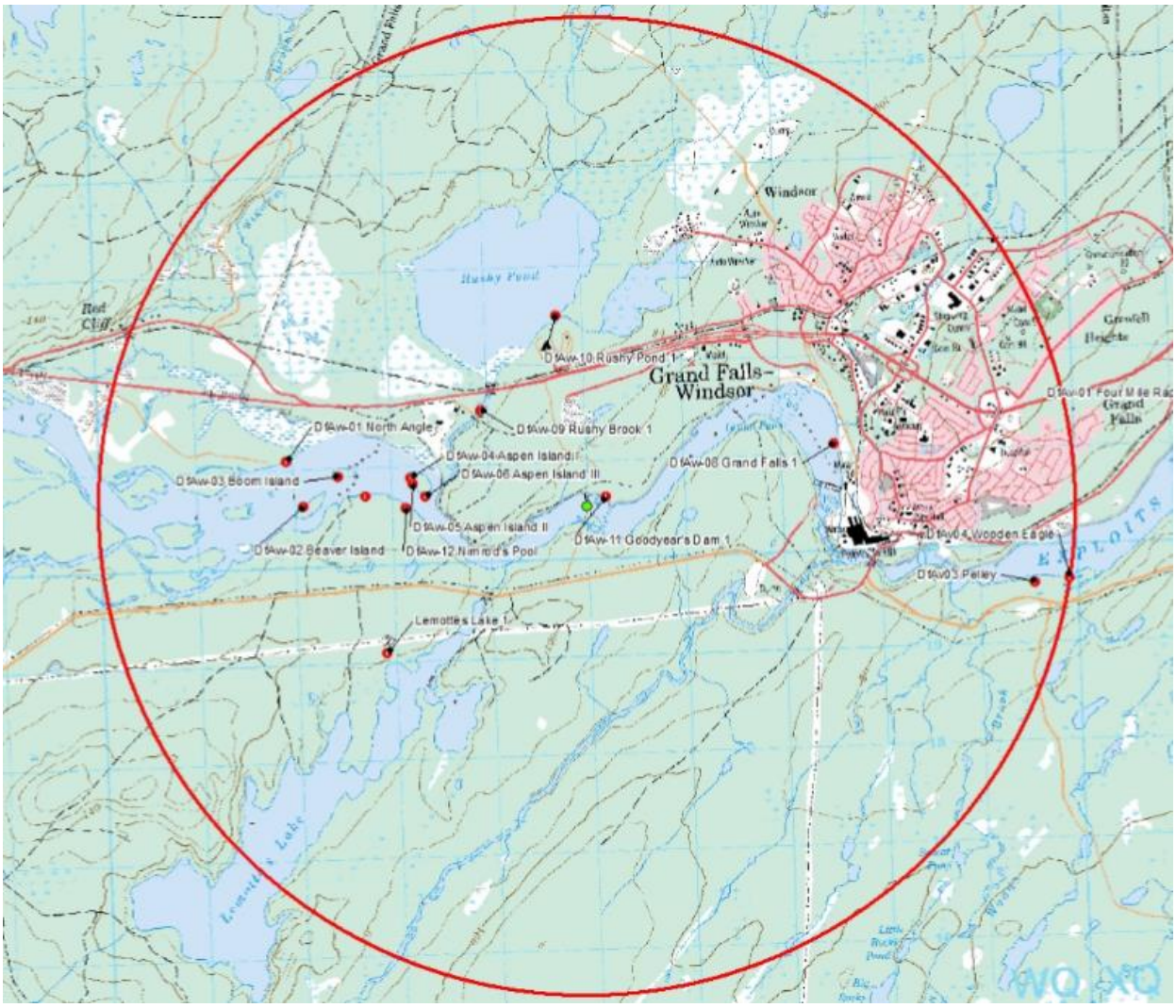

Figure 3.1. Registered Archaeological Sites Within a 5 km Radius of Goodyear's Dam (PAO Image)

Within the grouping of the 15 registered archaeological sites, one site (DfAw-11 - Goodyear's Dam 1) was reported to be situated on the north shoreline of the Exploits River at an estimated distance of 200 m downstream of Goodyear's Dam (see Figure 3.1 above). The site was identified by Schwarz during his 1992 project, when his investigations revealed a small, sub-rectangular boulder alignment thought to be a footing or building foundation that had apparently undergone substantial erosion, possibly during spring or fall when the flow of water in the river is high. Equally, scouring of the shoreline by ice during the highwater spring break-up could have been (and might have continued to be) another key factor contributing to the site-disturbance apparent in 1992. Associated with this confirmed cultural feature was a large rhyolite "flake" that may be of natural rather than cultural origin. Unfortunately, no artifacts or other cultural

indicators (*e.g.*, construction methods) were recorded at the site to firmly establish its age, cultural affiliation or function. Though not confirmed, it was proposed that the sustainably impacted boulder feature may have pertained to "recent" European activities along the river (Schwarz 1992), presumably logging, hunting, fishing, and/or trapping during the 19th or 20th century.

Regarding the location of the archaeological site DfAw-11 and its relationship to the current Project Area, when plotted using the coordinates listed on the Archaeological Site Record Form, the location falls at a location out in the river toward the south shoreline. That the coordinates provided are likely inaccurate is not entirely surprising, given that in 1992 (*i.e.*, pre-hand-held GPS units), they would have been calculated manually from a 1:50,000-scale topographic map, thus errors were inevitable and common at that time and earlier (and by no means limited to any individual field researcher). In any event, if the estimated distance of the site approximately 200 m downstream of Goodyear's Dam is generally accurate, this would place it outside the current Project Area by at least 70 m east of where construction activities required for the new dam will occur (Figure 3.1 above and 3.2 below).

3.1.2 Informant Interview Data

Information provided by Mr. Donald Pelley of Grand Falls-Windsor indicated that, to his knowledge, no Pre-contact or Historic-Period artifacts or other types of material culture, beyond that which is associated with logging activities on the river in the 20th century, have been found within or adjacent to the current Project Area.

3.1.3 Current Aerial Imagery, Topographic Mapping and Aerial Photography Analysis

The review of current aerial imagery (available on-line) and topographic mapping of the Project Area completed as part of the background research failed to identify any specific locations within either of the study Areas with heightened historic resources / archaeological potential. In fact, it was evident from the imagery that relatively large segments of the terrain adjacent to the existing dam (and the shoreline upstream and downstream of it), as well as along the associated roadways and access trails, had undergone varying degrees of ground disturbance through past construction and upgrading and maintenance activities, as well as from the apparent inundation of the shoreline. Along the waterfrontage of the various study Areas, no topographic or hydrographic features usually associated with an interior occupation by Indigenous or non-Indigenous peoples during the Pre-contact or Historic Periods were evident. This could include, for example, slightly elevated and relatively level and well-drained ground near the shoreline, or on prominent points of land jutting out into the river or at the confluence of waterbodies. In general, the analysis of the current imagery and mapping suggested that the potential for the presence of archaeological sites and materials within the Project Area was likely Low.

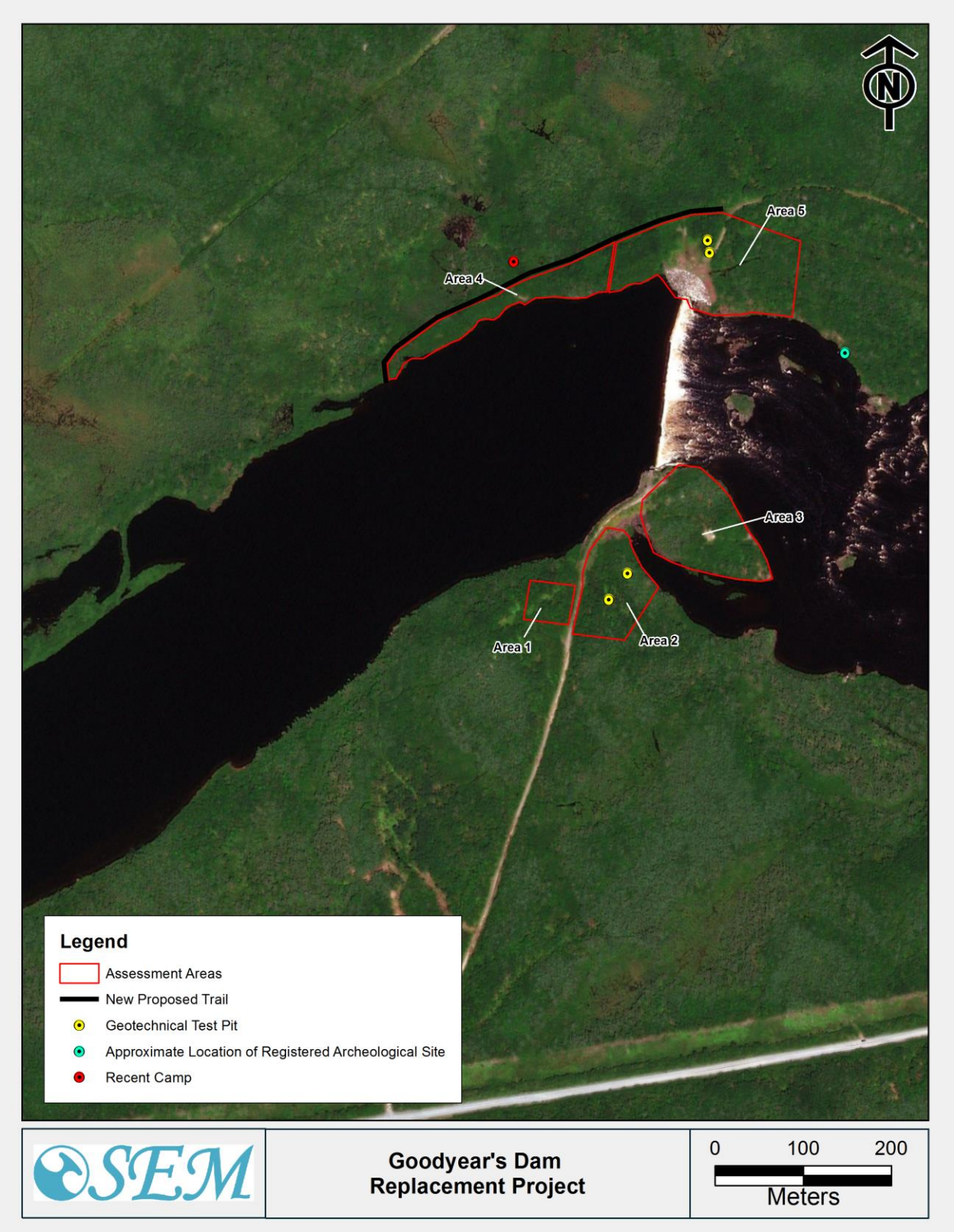

Figure 3.2. Project Area Showing Study Areas and Location of Archaeological Site DfAw-11

The analysis of the aerial photography showing the Project Area in 1946 and comparison of it with current aerial imagery, provided a general and approximate overview of the extent to which the shoreline above the dam has changed over the past 70 years (Figure 3.3). It is apparent that along virtually the entire length of the river shown in the image, water-levels are now significantly higher than they were when the aerial photograph used for the exercise was taken (Roll 348A, Frame 46: APML, Howley Building, St. John's, NL). Indeed, along the shoreline upstream of the dam on the north side of the river where assessment was required, significant inundation has occurred to the point that most of the former shoreline is now well underwater. Though upstream and outside Area 4 and away from the New Proposed Trail, it is evident that the rock and gravel bed of the Previous Trail (no doubt used for logging purposes) is still intact and, to the west of it, a relatively large pond has formed, thus providing further evidence for the extent of inundation. Even the small point of land at the southeast end of the former cove situated to the east of the Previous Trail, which may have been an area of archaeological potential prior to construction of the dam in 1911, is now largely underwater and is likely scoured each spring by ice. Regarding the Previous Trail itself that runs through Study Area 4, it appears from the image that parts of it will be used for the New Proposed Trail.

Though not as extensive as the area above the dam, the shoreline of the river on the north side below it, has also undergone some degree of inundation and construction-related disturbances, most notably around the north end of the dam where a massive pile of boulders has been placed in recent times to stabilize the waterfrontage and the structure itself. Additionally, construction and maintenance of the road currently used to access the north end of the dam has undoubtedly also caused further ground disturbance that would likely have dispersed, covered or obliterated any archaeological materials present in that area.

Regarding the south side of the river, the aerial photography analysis suggested that within Study Areas 2 and 3, little inundation is evident. However, without question, the northeast end of Area 2 and the northwest end of Area 3 have undergone substantial alterations due to dam construction and maintenance, thus any archaeological materials extant in those areas prior to 1911 would likely have been destroyed.

In summary, the information gleaned from the analysis of the 1946 aerial photography and comparison of it with current aerial imagery, further suggested that the historic resources / archaeological potential of the Project Area was likely Low. If any archaeological materials were present prior to 1911, they would likely have been disturbed or destroyed from dam and trail construction and maintenance, and from shoreline inundated caused by creation of the upstream reservoir and the frequent high water-levels and seasonal ice-scouring that has likely occurred over the past 70 years.

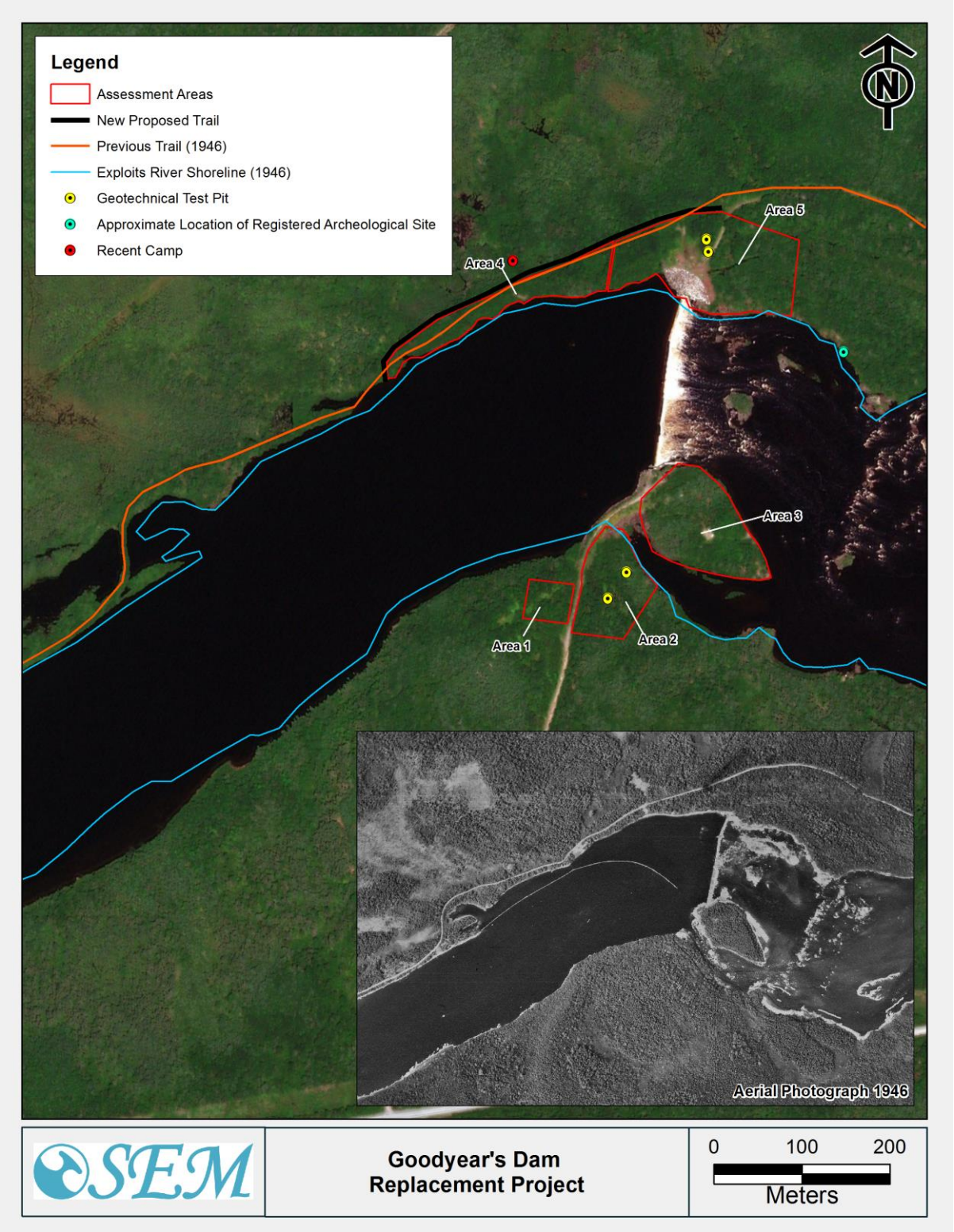

Figure 3.3. Aerial Photography and Current Aerial Imagery Analysis (note location of recent camp)

3.2 Field Study

As discussed, the Stage 1 Assessment consisted of the investigation of five study Areas and the corridor of a New Proposed Trail, as well as four mechanically-excavated geotechnical test-pits. A description of the findings at each location is presented below. Figure 3.4 shows an aerial view of the entire Project Area, including all study Areas. Note the extensive disturbance at both ends of the dam (and in the center of the former island - Area 3 - shown toward the left-hand side of the photo), and the vegetation patterns along the shoreline on both sides of the river in what appear to be low-lying areas, which suggests inundation and potentially wet ground conditions.

Figure 3.4. Northwest View of Project Area Showing All Study Areas (NL Hydro photo)

3.2.1 Area 1

Area 1 is situated on the south side of the river and partially encompasses a cleared and developed parcel of ground used in 2015 as a lay-down area during dam maintenance (Figures 3.3 and 3.4 above). It is proposed that the level, gravel parking lot be expanded into the surrounding wooded zone for use during the up-coming dam replacement project (Figure 3.5). The embankment around Area 1 was visually inspected for archaeological materials, and the wooded zone toward the river was walked and investigated with the excavation of 10 test-pits. The terrain toward the river that will be developed is relatively steep and has been partially disturbed due to previous construction activities. No materials of historic resources significance

were identified within Area 1 and the potential for any to be encountered during future construction activities appears Low.

Figure 3.5. North View Across Area 1, Showing Parking Area and Wooded Terrain to be Developed

3.2.2 Area 2

Area 2 is also situated on the south side of the river to the east of Area 1 on the opposite side of the access road leading to Goodyear's Dam (Figures 3.3 and 3.4 above). Area 2 is completely wooded with birch, spruce, fir and alder trees, and the vast majority of it is positioned back from the river on elevated terrain that, in places, is relatively sloped, particularly near the shoreline (Figure 3.4 above). The inland sections of Area 2 were walked and visually inspected for archaeological materials, and the shoreline at the northeast end was walked and investigated with the excavation of 16 test-pits. The terrain within the highest area of potential, the northeast shoreline, proved to be rocky and, in places, steep, partially disturbed from earlier dam construction and maintenance, and was otherwise very hilly and hummocky, with the presence of many large boulders (Figure 3.6). No materials of historic resources significance were identified within Area 2 and the potential for any to be encountered during future construction activities appears Low.

Figure 3.6. Southeast View of Area 2, Showing Northeast Shoreline (right-hand side)

3.2.3 Area 3

Area 3 is also situated on the south side of the river to the northeast of Area 2, and consists of a relatively large parcel of terrain that was formerly an island (Figures 3.3 and 3.4 above). The channel that once ran between the island and the mainland was used as a spillway during construction of the original dam in 1911 and for channeling logs through during subsequent log-drives (Figure 3.3; note log-boom in 1946 photograph). Area 3 is primarily wooded, but does have a relatively wide northeast-to-southwest-oriented ATV trail running through it. Roughly in the center of the island along the trail, is a wide-open clearing that appears to be used for campfires and for discarding domestic refuse, including home appliances (Figure 3.4 above). The west side of the island along the tailrace is rocky and steep, and shows considerable evidence of seasonal flooding and possibly ice-scouring at the southeast end (Figure 3.7). All other shorelines of Area 3 are either low-lying and have, therefore, been severely washed and ice-scoured seasonally, or are rocky, steep and boulder-strewn.

Figure 3.7. Southeast View of Shoreline of West Side of Area 3 (left-hand side)

Area 3 was walked and visually inspected for archaeological materials, and investigated with the excavation of 36 test-pits. No materials of historic resources significance were identified and the potential for any to be encountered during future construction activities appears Low. Any archaeological materials that may been present at Area 3 (which, if extant, would likely have been near the water at the downstream end), almost certainly would have been dispersed and and/or destroyed due to past construction and maintenance activities, recent ground-clearing for trail development and use, and widespread seasonal flooding and ice-scouring (Figure 3.4 above). No materials of historic resources significance were identified within Area 3 and the potential for any to be encountered during future construction activities appears Low.

3.2.4 Area 4

Area 4 is situated on the north side of the river to the west of the dam, and encompasses the terrain between the New Proposed Trail and the shoreline (Figure 3.3). Assessment of this Area revealed it to be largely low-lying and wet, with numerous marshy areas back from the shore. In many places, the shoreline itself is muddy and grass-covered and, as it is currently, would not be suitable for human settlement (Figure 3.8, and Figure 3.4 above).

Figure 3.8. East View Toward Dam Showing Shoreline Fronting Areas 4 and 5 (note evidence of inundation)

As discussed above and shown in Figure 3.3, this shoreline has undergone substantial inundation since construction of the dam in 1911, and the environmental conditions noted during the Stage 1 Assessment field study are almost certainly attributable to flooding. Even within most of the locations where shovel-testing was possible, the ground is hummocky and rocky, with few locations of interest observed.

The beach fronting Area 4 was walked to its western end (and beyond), and examined for any archaeological materials. During the return transect to the east end, a total of 70 test-pits were excavated in various wooded zones back from the shoreline where relatively level and well-drained terrain was observed. With the exception of one location where a concentration of relatively modern domestic refuse was noted 20 m outside the inland boundary of Area 4 (included were tin cans, glass condiment bottles and metal barrel hoops, likely deriving from a mid-20th century logging camp), no materials of historic resources significance were identified and the potential for any to be encountered during future construction activities appears Low. The location of the Recent Camp is shown on Figure 3.3 above.

3.2.5 Area 5

Area 5 is also located on the north shore of the river to the northeast of Area 4 and to the southeast of the north end of the existing dam (Figures 3.3 and 3.4 above). For the most part, the environmental conditions observed throughout Area 4 also exist throughout the western

portion of Area 5 upstream of the dam. Most notably this includes severe inundation and potential ice-scouring of the shoreline. Additionally, a large segment of Area 5 at the northeast end has undergone significant ground disturbance from dam and access road construction and maintenance, and from infilling with large boulders and ground levelling around the north end of the existing dam (Figure 3.9, and Figure 3.4 above).

Figure 3.9. Northeast Portion of Area 5 Looking Southwest (note ground disturbance)

The beach fronting Study Area 5 was walked to its western end and examined for any archaeological materials. During the return transect to the east, which terminated at the north end of the dam, a total of 33 test pits were excavated in various wooded areas back from the shoreline where relatively level and well-drained terrain was observed. No materials of historic resources significance were identified and the potential for any to be encountered during future construction activities appears Low.

The portion of Study Area 5 below the dam was also walked and examined for archaeological materials and features (Figure 3.3, and Figure 3.4 above). It was noted that the terrain near the dam has been levelled and covered with large boulders, thus any archaeological materials present at that location would have been dispersed, destroyed or buried. No test-pits were excavated in this area.

The shoreline throughout the remaining portion of Area 5 further downstream of the dam on the north side of the river, is rocky and rises relatively sharply, with the immediately adjacent wooded area being slightly elevated, thus it appears to have escaped severe ice-scouring. However, the nature of the vegetation cover above the beach and the presence of wood and plastic debris well back in among the trees, suggest that it too is subjected to seasonal flooding (Figure 3.10). The extremely rocky beach was visually examined for the presence of archaeological materials, and the inland wooded portion was investigated with the excavation of 16 test-pits. No materials of historic resources significance were identified and the potential for any to be encountered during future construction activities appears Low.

Figure 3.10. Northwest View of Area 5 Below the Dam (note rocky and steep shoreline)

Despite a search for the registered archaeological site DfAw-11 reported to be situated on the north side of the river approximately 200 m downstream of the dam, no evidence of it was identified during the visual examination, which as seen in Figure 3.10 above, encompassed all the terrain to the downstream end of the cove in which the site is supposed to be situated. Therefore, it is possible that the site is located further downstream, which seems unlikely based on the site description and location described on the Archaeological Site Record form, or it has been further disturbed by highwater and ice scouring, and, consequently, has been destroyed.

3.2.6 New Proposed Trail

The New Proposed Trail is situated on the north side of the river and extends along the inland boundaries of Areas 4 and 5 and, in many locations, follows the corridor of the Previous Trail (1946) shown on the aerial photograph from 1946 (Figure 3.3 above). Essentially, the route of the New Proposed Trail was assessed for the presence of historic resources during the visual examination and shovel-testing carried out at Areas 4 and 5, thus the conditions observed are the same and the areas tested overlap. Consequently, no additional information regarding this proposed Project feature is presented here. In summary, no materials of historic resources significance were identified along the corridor of the New Proposed Trail and the potential for any to be encountered during future construction activities appears Low.

3.2.7 Geotechnical Test-Pits

The four geotechnical test-pits excavated during the Stage 1 Assessment field study did not encounter or cause disturbance to any historic resources. The two pits excavated on the south side of the river were positioned in a wooded area well back from the shoreline of the Exploits River, where any extant archaeological sites or materials would most likely have been situated (Figure 3.3). In addition, these two test-pits were dug on terrain with a slope exceeding that which would usually be considered suitable for human settlement. No materials of historic resources significance were identified and the potential for any to be encountered in these locations during future construction activities appears Low.

Regarding the two geotechnical test-pits dug on the north side of the river (Figure 3.3), both were positioned adjacent to the existing access road to the dam and were dug partially through material that appeared to have deposited relatively recently as fill, possibly for road construction and ground levelling. No materials of historic resources significance were identified and the potential for any to be encountered in these locations during future construction activities appears Low.

4.0 SUMMARY AND CONCLUSIONS

In November of 2017, Sikumiut Environmental Management Ltd. (SEM) completed a Stage 1 Historic Resources Assessment on the Exploits River approximately 4 km west of the community of Grand Falls-Windsor, NL, prior to commencement of construction activities required for NL Hydro's replacement of the aging Goodyear's Dam. In accordance with the guidelines for historic resources research in the province of NL, the primary objectives of the study were to identify and assess the historic resources / archaeological potential or sensitivity within the Project Area and recommend the appropriate methodology and scope for further detailed impact studies in Stage 2, if indicated. The Stage 1 Assessment involved background research and submission of an Archaeological Investigation Permit Application to the PAO, a field study, and preparation of this required report on the work.

The principal finding of the pre-fieldwork background research obtained through a literature and documentation review, as well as from an analysis of current aerial imagery and comparison of it with aerial photography from 1946, suggested that the overall historic resources / archaeological potential of the Project Area was likely Low. This conclusion derived from the fact that large segments of the shoreline (and near-shoreline inland areas), where any extant archaeological sites or materials would most likely have been situated, appeared to have experienced substantial disturbance from past construction and maintenance of the dam and access roads, and from inundation and ice-scouring of the shoreline following the building of the dam in 1911 and creation of the upstream reservoir. Consequently, if any historic resources / archaeological materials were present within the Project Area prior to construction of Goodyear's Dam, given the ground and shoreline disturbances identified through the background research, it appeared that the probability that they remained *in situ* in locations where they could be identified was Low. An additional finding of the background research was information regarding one archaeological site that was recorded in 1992 on the north shoreline of the Exploits River approximately 200 m downstream of the dam. This site, registered with the PAO as DfAw-11 – Goodyear's Dam 1, consisted of a small, sub-rectangular boulder alignment thought to be a footing or building foundation dating to the 19th or 20th century that had apparently undergone substantial erosion, possibly during spring and/or fall when the water in the river is high, or from potential ice-scouring during spring break-up. Associated with this confirmed cultural feature was a large rhyolite "flake" that may be of natural rather than cultural origin. No artifacts or other cultural indicators (*e.g.*, construction methods) were recorded at the site in 1992 to firmly establish its age, cultural affiliation or function. If the position of the find described on the Archaeological Site Record Form is generally accurate, this would place it outside the current Project Area by at least 70 m downstream of where construction activities required for the new dam will occur. Consequently, no direct Project-related interactions are anticipated.

The field study for the Stage 1 involved an investigation of six discrete Areas, including three on the south of the river and three on the north. It also involved the testing and monitoring of four geotechnical test-pits. The field investigation of each Area consisted of an examination of the shoreline fronting five of the Areas and the corridor of a New Proposed Trail, and the excavation

of shovel test-pits at any locations within those Areas considered suitable for human habitation and where archaeological materials might be present. Despite a thorough visual examination and the excavation of 186 shovel test-pits, no materials of historic resources significance were identified at any of the locations investigated, and the potential for any to be encountered within the Project Area during future construction activities appears Low as a result of the factors described above (*i.e.*, past construction-related ground disturbance and the resulting inundation and ice-scouring of the shoreline where any extant archaeological materials would likely have been situated). Regarding the registered archaeological site DfAw-11, despite a thorough search of the general location where it was reported to be, no evidence of it was found. Therefore, it is possible that the site is located further downstream, which seems unlikely based on the site description and location described on the Archaeological Site Record form, or it has been further impacted by highwater and ice-scouring, and consequently has been destroyed or dispersed to the point that it is no longer readily recognizable. Regarding the Recent Camp found approximately 20 m to the north of the New Proposed Trail on the north side of the river near Area 4, the recent age and nature of the find, which is probably the remains a mid-20th century camp, possibly used during logging activities, does not warrant further investigation or mitigation. This approach was discussed with PAO Archaeologist Dr. John Erwin, who agreed that no further work on the site is necessary, nor will it be recorded and entered into the PAO site record inventory. Its location outside the current Project Area suggests that no construction interactions will occur.

In conclusion, other than the development of an Environmental Protection Plan outlining procedures for personnel to follow if any historic resources / archaeological materials are inadvertently discovered or otherwise encountered during any stage of the upcoming Project (which could include the site DfAw-11), no specific mitigation measures or further detailed impact studies (*e.g.*, Stage 2) are warranted or recommended.

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Personal Communications

Dr. John Erwin: PAO Archaeologist, St. John's, NL.

Mr. Donald Pelley: Archaeological Assistant, Grand Falls-Windsor, NL.

Appendix E – Environmental Protection Plan

Newfoundland and Labrador Hydro
Environmental Protection Plan

Goodyear's Dam Life Extension Project

2025-02-27

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Table of Contents

Abbreviations and Glossary

Abbreviations

Abbreviation	Description
ACCDC	Atlantic Canada Conservation Data Centre
ATV	All-Terrain Vehicle
CDA	Canadian Dam Association
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWS	Canadian Wildlife Services
ECCC	Environment and Climate Change Canada
EIS	Environmental Impact Statement
EMS	Environmental Management System
EPP	Environment Protection Plan
ERMA	Environmental Resources Management Association
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
GAP	*Storage and Handling of Gasoline and Associated Products Regulations*
GHG	Greenhouse Gas
GIS	Geographic Information System
GSC	Government Services Centre
HSE	Health, Safety & Environment
ISO	International Organization for Standardization
MBCA	Migratory Birds Convention Act
NL Hydro (NLH)	Newfoundland and Labrador Hydro
NLDGS	Newfoundland & Labrador Digital Government and Service
NLDFAL	Newfoundland & Labrador Department of Forestry, Agriculture and Lands
NLECCC (ECCC)	NL Department of Environment, Conservation and Climate Change
NLEPA	Newfoundland and Labrador Environmental Protection Act
NLESA	Newfoundland and Labrador Endangered Species Act
PAO	Provincial Archaeology Office

Abbreviation	Description
PPV	Peak Particle Velocity
RFR	Request For Review
SAR	Species At Risk
SARA	Species At Risk Act
TBD	To Be Determined
TSS	Total Suspended Solids
UOC	Used Oil Control
WHMIS	Workplace Hazardous Materials Information System
WHSCC	Workplace Health, Safety and Compensation Commission
WRMD	Water Resources Management Division

Glossary of terms

Term	Explanation
Anadromous	Fish that migrate from the sea into freshwater rivers to spawn.
Auxiliary Water Supply System	An additional water source or mechanism designed to ensure adequate flow in fishways or other structures, especially during low water conditions.
Bedrock Outcropping	Exposed sections of solid rock at the earth's surface, often visible in riverbeds or construction sites.
Buttressing (Rockfill Buttressing)	The process of reinforcing a dam or structure with additional rock material to improve stability and extend service life.
Cofferdam	A temporary water-tight enclosure within or across a body of water to allow construction work in a dry area.
Decommissioning	The process of taking a facility, structure, or equipment out of service and safely closing or removing it.
Environmental Assessment (EA)	A formal process to evaluate the potential environmental impacts of a proposed project, as required by legislation.
Environmental Protection Plan (EPP)	A document outlining procedures and measures to minimize environmental impacts during construction and operation.
Fish Passage / Fishway	Structures or modifications that enable fish to bypass obstacles (like dams) during migration.

Term	Explanation
Frazil Ice	Small, loose ice crystals that form in supercooled, turbulent water, often causing operational issues at hydroelectric facilities.
Fording	Crossing a body of water.
Head Pond	The body of water immediately upstream of a dam, used to maintain water levels for power generation or ice control.
Hydroelectric Generation Station	A facility that produces electricity by harnessing the energy of flowing water.
Laydown Area	Designated space near a construction site for storing materials, equipment, and temporary facilities.
Mitigation Measures	Actions taken to reduce or eliminate negative environmental impacts of a project.
Peak Particle Velocity	A measure of the maximum speed at which particles in the ground move during blasting, used to assess potential damage to structures and habitats.
Riprap	Large rocks or other material placed along shorelines, riverbanks, or dam faces to prevent erosion and absorb energy from water flow.
Salmonid	A family of fish that includes salmon, trout, and char, many of which are important for recreational and commercial fisheries.
Service Life	The expected period during which a structure or component remains functional and safe for use.
Silt Curtain	A floating barrier used to contain sediment in water during construction activities.
Sluice Gate	A movable barrier used to control water flow in a dam or channel.
Valued Components (VCs)	Key element (e.g., air, water, wildlife, socioeconomic factors) that are considered in environmental assessments due to their ecological, culture, or economic importance.

Executive Summary

The Environmental Protection Plan (EPP) for the Goodyear's Dam Life Extension Project, prepared for Newfoundland and Labrador Hydro by WSP Canada Inc., outlines the procedures and measures to minimize environmental impacts during the repair and extension of Goodyear's Dam. The EPP is designed to ensure that all project activities comply with applicable federal and provincial regulations, protect valued environmental components, and provide clear guidance to project personnel, contractors, and regulators.

Key objectives of the EPP include:

- Preventing or minimizing environmental effects related to construction and operation.
- Documenting environmental concerns and appropriate protection measures.
- Providing concise instructions and training for all personnel involved in the project.
- Serving as a reference for legislative requirements and permits.

The EPP covers a wide range of environmental protection procedures, including:

- **Vegetation clearing** and site preparation with minimal disturbance.
- **Fuel storage, handling, and spill response** to prevent contamination.
- **Waste management** and proper disposal of hazardous materials.
- **Equipment movement** and restrictions near water bodies to mitigate erosion and sedimentation.
- **Work near or in water**, including fish habitat protection and sediment control.
- **Erosion and sediment control, including excavation and backfilling**.
- **Blasting** and **noise.**
- **Wildlife protection**, rare species and habitat avoidance, and contingency plans for wildlife encounters.
- **Historic and archaeological resource protection** and reporting procedures for discoveries.
- **Emergency response plans** for spills, wildlife encounters, and forest fires.

The plan also details the responsibilities of the Contractor, NLH, EPP holders, and project personnel in implementing, revising, and maintaining the EPP. It includes a comprehensive list of required permits and approvals, contact information for key agencies, and appendices with supporting documentation.

1. Purpose

The purpose of the Environmental Protection Plan (EPP) is to:

- Ensure environmental effects related to the Goodyear's Dam Life Extension Project will be prevented or minimized;
- Document environmental concerns and appropriate protection measures;
- Provide concise and clear instruction to all project personnel, including Newfoundland and Labrador Hydro (NLH) staff, contractors, and sub-contractors regarding procedures for protecting the environment and preventing or minimizing environmental effects;
- Provide a training aid for field personnel; and
- Provide a reference to applicable legislative requirements, including all permits (Appendix A) acquired in support of the Scope of Work.

2. Scope

The EPP provides instructions and guidance to ensure that environmental protection procedures are understood and implemented for both routine activities and unplanned events associated with Goodyear's Dam Life Extension Project. The scope of the EPP is to:

- Outline NL Hydro's environmental policies;
- Assess potential environmental concerns;
- Describe general environmental protection procedures for anticipated field work, and additional activity-specific measures where necessary; and
- Provide guidelines for response plans (contingency plans) for unplanned events (accidents or malfunctions).

The scope of activities is limited to the construction, commissioning and monitoring of the works associated with the Goodyear's Dam Life Extension project. Routine operation and maintenance activities are addressed under NL Hydro's existing registered ISO 14001 Environmental Management System for the Grand Falls Hydroelectric Facility.

3. Reference Documents

3.1 Provincial Legislation

- Environmental Protection Act
  - Storage and Handling of Gasoline and Associated Products Regulations (and associated Guidelines for Drum-Based Petroleum Products Storage and Operation at Remote Sites)
  - Waste Management Regulations
  - Waste Diversion Regulations
  - Used Oil and Used Glycol Control Regulations
- Fire Protection Services Act
  - Fire Protection Services Regulations
- Forestry Act
  - Forest Fire Regulations
- Water Resources Act
  - Environmental Control Water and Sewage Regulations
- Historic Resources Act
- Mines Act
- Wild Life Act
  - Wild Life Regulations
- Occupational Health and Safety Act
  - Occupational Health and Safety Regulations

3.2 Federal Legislation

- Transportation of Dangerous Goods Act and Regulations
- Canadian Environmental Protection Act, and Regulations
- Pollutant Substances Regulations
- Species at Risk Act
- Fisheries Act and Regulations
- Migratory Birds Convention Act
  - Migratory Birds Regulations

3.3 Additional Documents

- DFO Code of Practice: In-water structures: Maintenance and repair
- DFO Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters
- DFO Standard: In-water site isolation
- Wildlife Encounters Contingency Plan
- Discovery of Historic Resources Contingency Plan
- Forest Fires Contingency Plan
- Goodyear's Dam EA Fish Migration/ Movement Plan

4. Responsibilities

The **Contractor** will build, supply and/or install various components of the Project or be involved in provision of services to support construction and/or procurement. The Contractor is accountable and responsible for the following:

- Ensure personnel are familiar with the EPP and its procedures;
- Be knowledgeable of reporting procedures;
- Implementing environmental protection procedures as outlined in the EPP;
- Holding toolbox meetings at the start of each shift to discuss health, safety and environmental issues;
- Developing their own orientation and training package to deliver to individuals entering the Sites on their behalf;
- Ensuring EPP conditions are reflected in their proposals and bids, and shall comply with all relevant regulations, guidelines, permits, approvals and authorizations;
- Contractors may be consulted, as required, on aspects of environmental monitoring;
- Conduct a review of the EPP on an as needed basis, particularly if scope or site conditions change;
- Review revision requests and ensure revisions are distributed to EPP holders, and communicated to project personnel; and
- Reporting directly to NLH required environmental compliance monitoring and compliance tracking.

NL Hydro will be accountable for the development, implementation and management of this EPP, along with Contractors, as well as associated environmental compliance monitoring. NLH is accountable and responsible for the following:

- Review and verify the commitments and requirements of the EA, permits and approvals are included in the EPP as it relates to their work, and their implementation;
- Providing support for the development and implementation of the EPP and will be consulted on management or revisions of the EPP;
- Providing project environmental awareness to project staff through orientation;
- Providing training to the Contractor (prior to mobilization), including review of all project plans and requirements;

- Providing support and consultation for environmental compliance monitoring;
- Review of the EPP to ensure compliance with conditions of applicable permits;
- Monitor Contractor compliance with EPP; and
- Audit compliance with the EPP and provide feedback on audit findings.

All EPP holders will:

- Keep copy current and ensure all revisions are entered on revision control record;
- Familiarize themselves and project personnel with the EPP and any revisions; and
- Initiate changes to improve the quality of the plan.

4.1 Revisions

EPP holders and readers may initiate proposed revisions by forwarding recommended revisions to NL Hydro (NLH) on the Revision Request Initiation Form (Appendix B) which provides the revision instructions and lists the sections being superseded. Once the EPP has been accepted, NLH will review and accept revisions prior to being incorporated.

4.2 Revision Procedures

Revision requests must be approved and accepted by NLH. Accepted revisions will be issued to all EPP holders. Each revision must be documented on the Revision Control Record (Appendix C).

An updated Table of Contents will be included with each revision. This table of contents will indicate current status of each section contained in the plan.

When EPP holders receive a revision they are responsible to:

- Read the text of the revision;
- Check the control record to ensure all the listed pages have been received;
- Remove and discard the superseded pages;
- Insert the revised pages in the proper places;
- Check the pages of the plan using the updated table of contents to ensure the plan is complete and current;
- Enter the revision number and date on the Revision Control Record;
- Incorporate the revision into the area of responsibility, as appropriate;
- Ensure personnel are familiar with the revisions; and
- Sign and return acknowledgment of receipt slip to NLH.

5. Project Policies

5.1 Environmental Policy

NLH views environmental protection planning as an important component of overall project planning and development. Environmental Protection Plans (EPPs) are a practical way in which important environmental protection information related to project activities can be summarized and shared with project personnel.

NLH is committed to a high level of environmental protection in its work areas and activities associated with the proposed development.

An EPP is a working document for use in the field for both project personnel and environmental and engineering field teams. An EPP is also important at the corporate level for ensuring the commitments made in policy statements are implemented and monitored. The corporate Environmental Policy can be found in Appendix D. EPPs provide a quick reference for project personnel including contractors, subcontractors and regulators to monitor compliance and to make suggestions for improvements.

5.2 Hunting and Fishing Policy

Project personnel are not permitted to hunt, trap or fish, whether on or off duty, at any time during their work term at any NLH work site and support infrastructure.

Firearms are not permitted at any work site, unless authorized by government regulators and the NLH for use in protection against wildlife.

5.3 Anti-Idling Policy

NLH recognizes that the idling of motor vehicles and equipment has a negative impact on human health and the environment by way of greenhouse gases (GHGs), particulates, and other emissions released during the combustion process. This policy applies to all employees who operate vehicles or equipment owned, leased, or rented by NLH. The policy also applies to contractors working directly or indirectly for NLH and to contractors working on NLH owned property. All operators of vehicles must ensure that when vehicles or equipment are not required to be running for operational purposes every effort is made to reduce or eliminate engine idling. Specific idling times are permitted to provide safe and efficient warm-up of vehicles and equipment. Exceptions apply to emergency vehicles engaged in operational activities such as public safety, fire services, police services, or responding to medical emergencies. Exceptions also apply to vehicles without an auxiliary power supply being used to power auxiliary equipment or other power needs including hydraulics, lifts, emergency lights, compressors, generators, or any other equipment requiring electric power.

5.4 Wildlife Encounters Policy

Wildlife encounters pose a risk of stress or injury to project personnel and wildlife. Control measures and protection procedures established by NLH must be followed by all Project Personnel, to minimize the risk to both wildlife and humans. Under the Wild Life Act, a permit to destroy problem animals must be obtained from the Newfoundland and Labrador Department of Forestry, Agriculture and Lands (NLDFAL) in order to destroy moose, black bears, or other wildlife that interfere with operations or dwellings.

5.5 Environmental Orientation

NLH is committed to engaging field workers in an active environmental orientation and ongoing environmental awareness program. All project personnel undertaking activities in the field must receive an EPP orientation prior to initiating work. The orientation will focus on the environmental protection procedures associated with the field work that will be completed.

5.6 Permits and Approvals

Appendix B contains a list of potential permits and approvals that may be required to complete field work. An assessment should be completed of all required permits and approvals, and no construction activities requiring permits or approval will commence until the required permits have been obtained. Copies of permit applications and permits must be provided to the NLH prior to work being initiated. Project personnel will comply with all conditions, of such approvals, permits, licenses or authorizations. Appendix A is to be used as a reference.

6. General Environmental Protection Procedures

This section provides general environmental protection procedures for anticipated activities associated with the Goodyear's Dam Life Extension project and associated support services.

6.1 Vegetation Clearing

Environmental Concerns

Vegetation clearing (e.g., trees, shrubs) will be required for site preparation of fishway and laydown areas. The primary concern during clearing is to prevent ground disturbance that may result in the sedimentation of watercourses and wetlands, and to avoid impacts to nesting birds and adjacent vegetation.

Environmental Protection Procedures

Appropriate measures will be implemented to minimize potential negative effects of vegetation removal. A policy of minimum disturbance will be maintained at all times. Clearing activities will comply with the requirements of all applicable permits, including the Commercial Cutting Permit and the Operating Permit. Approval must be obtained before any clearing may begin.

1. A cutting permit will be obtained from the NLDFAL prior to the start of any required site clearing. Clearing or removal of trees, shrubs and ground cover will be restricted to the minimum areas needed for the site and stockpiles.
2. An operating permit will be required for work during the forest fire season from the NLDFAL prior to the start of any required site clearing. Conditions and requirements of this permit will be met (e.g. spark arrest, refuelling, etc.).
3. Clearing shall consist of cutting parallel to and within 15 cm or less of the ground, and properly disposing of all standing trees, as well as the removal of all shrubs, slash, and debris from the area. All trees and brush will then be cut into lengths to ensure neat piling. Brush will not be piled higher than 3 m.
4. For any work within 15 meters of the waterbody, required permits will be acquired and adhered to (refer to Section 6.5) .
5. Merchantable timber is defined as any and all species cut down to an 8 cm top and suitable for use as saw logs or firewood. This wood will be cut into lengths of 2.5 m and 1.22 m to ensure use down to the required 8 cm top diameter. A Timber Purchase License, issued under the *Forestry Act*, is

required to purchase or acquire timber cut on crown or public land for subsequent sale or barter. This permit must be obtained from the NLDFAL.

6. All merchantable or forest product timber may be salvaged. The disposition of salvaged timber should be determined in consultation with NLH.
7. All salvaged timber will be piled so as not to obstruct the access or work of others, damage vegetation or be placed within buffer zones of critical habitat. All trees and brush will be cut in lengths so as to ensure neat piling. Slash shall be piled so as not to cause unnecessary disfigurement of vegetation outside the cleared area. A 6.5 m break in slash piles will be made every 200 m to allow for drainage and animal access. The maximum height of the piles will not exceed 3 m.
8. Slash will not be permitted to enter any watercourse and will be piled above spring flood levels.
9. Chain saws or other hand-held equipment shall be used in clearing vegetation, except where alternative methods or equipment are approved. The use of mechanical clearing methods, such as heavy equipment, shall not occur without prior approval of NLH.
10. Where possible, timber will be felled inward toward the work area to avoid damaging any standing trees within the immediate work area.
11. Any features such as tent frames consisting of cut poles placed in a rectangular arrangement to hold a tent cover, or rocks piled or placed in an irregular or symmetrical fashion (e.g., circle) shall not be disturbed. Such features are indicative of cultural or archaeological sites and shall be avoided (refer to section 6.14).
12. Bird surveys will be conducted between April and August.
13. No clearing will take place within 800 m of an active raptor nest. If an active nest is encountered during clearing activities, a buffer will be established in consultation with regulators and remain in place for the duration of the breeding season. If a tree containing an inactive raptor or corvid nest is encountered during clearing of construction sites (other than transmission lines), the nest will be assessed for viability. If the nest is deemed viable, a platform will be established as approved by the ECCC Wildlife Division.
14. Clearing activities will be restricted from April 1 - August 31 in Newfoundland (on the island), to the extent reasonably practical. Work areas shall be assessed for the presence of active nests containing birds and/or eggs prior to commencing work.
15. If an active nest is discovered, a minimum 10 m buffer shall be applied and adhered to.
16. Work in the vicinity of the nest is to be minimized, breaks will occur outside the buffer, and the area is to be vacated directly upon completion of work.
17. A standardized record form shall be completed for each pre-work assessment to document the findings. The completed forms shall be retained for regulatory review upon request.
18. NLH must provide direction prior to removing a bird nest buffer and commencing work. If an active nest is discovered outside of the main nesting period, a buffer must still be applied and documented.

6.2 Fuel Storage, Handling, and Disposal

For this project, fuelling of heavy equipment will only be carried out at the loading/unloading areas (adjacent to major roadways) and at the laydown areas. Fuel for heavy equipment operation will be delivered to site and dispensed to equipment by a fuel delivery vehicle as required. Bulk storage of fuel at work sites and the laydown area will not be permitted. Pick-up truck refuelling will take place at the nearest service station. Chainsaws will be refuelled using 8L jerry-cans and chain oil will be environmentally approved. Appropriate spill kits will be kept with every machine.

Environmental Concerns

Concerns regarding the use of fuel include the potential for uncontrolled release to the environment through spillage and subsequent adverse effects on terrestrial and aquatic habitat and species, soil, groundwater quality, and human safety and health.

Environmental Protection Procedures

Fuel includes equipment fuel (diesel and gasoline) for heavy equipment, pumps and chainsaws. A small quantity of lubricating greases and hydraulic oils may often be kept on each piece of machinery. All personal vehicles should be fueled at the nearest service station.

The following precautions should be taken to prevent and minimize spillage, misplacement or loss of fuels and other hazardous materials:

1. The delivery, storage, use and disposal of these hazardous materials will be handled only by trained personnel in accordance with government laws and regulations.
2. Operators shall be in attendance for the duration of all refuelling operations. Refuelling of equipment shall be monitored at all times to enable immediate shut down of fuel transfer and appropriate response in the event of a spill or leak being identified.
3. All equipment to be used will be mechanically sound, with no oil or gas leaks. Equipment will be inspected frequently by the contractor. Equipment working in the placement of materials in the waterbody shall be inspected at the beginning of each shift. Any leaks will be repaired immediately and leaked or spilled hydrocarbons will be cleaned up immediately.
4. All fuel storage and handling shall be conducted in accordance with the *Storage and Handling of Gasoline and Associated Products Regulations* (GAP) 2003, NLR 58/03. Handling and fuelling procedures shall also comply with WHMIS, applicable sections of the National Fire Code and Fire Prevention Act, and any additional requirements brought forth by ECCC and permits and approvals to limit potential contamination of soil or water.
5. Mobile fuel tanks must comply with the Transportation of Dangerous Goods Regulations, SOR/2012-245 which requires intermediate containers to comply with the requirements of CAN/CGSB-43.146-2002. Mobile tanks must also be properly secured in the back of vehicles.

6. Fuel (diesel and gasoline) will be transported to the work site by vehicle in approved tanks; all fuel transported will have secondary containment.
7. All fuel consuming equipment will have spill kits, drip pans/quick berms surrounding the fuel tank, and a supply of absorbent material stored with or within them, replaced as needed.
8. Fuel shall be stored in appropriate and approved storage containers up to a maximum capacity of 20 L. All hydrocarbons and hazardous chemicals stored on site will have secondary containment.
9. Servicing or refuelling of mobile equipment on land shall not be performed within 30 m of a watercourse.
10. Refuelling may be required within 15 m of a waterbody such as for water intake pumps used for dewatering. All water pumps will be equipped with a drip pan and lined with absorbent material to collect any leaks or spills that may occur.
11. Fuel storage areas and fuel transfer lines will be clearly marked or barricaded to ensure they are not damaged by moving vehicles. The markers shall be visible under all weather conditions and barriers should be constructed in compliance with the GAP.
12. Used oils shall be collected, stored, transported, and disposed of as per *Used Oil and Used Glycol Control Regulations*. Companies involved in the collection, transportation, and storage of used oil must obtain a certificate of approval from GSC/ECCC. Approvals must be requested and obtained prior to the handling and disposal of used oils and a copy kept on file. Used oil shall be stored in a used oil storage tank meeting the requirements outlined in sections 18 and 21 of the UOC regulations. Used oil can be stored in 205 L drums as long as the quantity does not exceed 205 L; the drums are clearly marked “used oil”; the drum is 18 gauge steel; the drum has secondary containment; the top of the drum is equipped with a sufficient opening to prevent spillage during filling or emptying; the drum is equipped with venting if it is intended to be vacuumed out and; it complies with CAN/CGSB – 43.150-95 if the drum is to be transported by road. No greater than one 205 L drum of oil will be stored on site.
13. Any soil contaminated by leaks or spills of any petroleum product from equipment shall be excavated, stored in an approved container and disposed of off-site at a licensed disposal site.
14. A copy of the Contingency Plan for Fuel and Hazardous Spills, Section 7.1 of this plan, shall be present at storage facilities and during transfer of fuel. In the event of a spill, the outlined procedures will be followed.
15. Diesel fuel and gasoline shall be stored in appropriate 20 litre containers, e.g. yellow containers for diesel, red containers for gasoline. Containers shall be clearly identified stating containers contents as well as the appropriate UN number.
16. Smoking will be prohibited within 15 m of a fuel storage area. Fuel storage areas shall be equipped with appropriate signage reflecting this requirement.
17. Lubricants, hydraulic fluid, grease, gasoline, diesel or other fuels will not be stored within 30 m of any watercourse.

18. Empty drums shall be backhauled to {Location TBD Based on Site} on a daily basis. Bungs shall be inspected and tightened prior to shipment off site.

19. The contractor is responsible for reporting any environmental problem encountered in connection with the Exploits River, or any nearby body of water, to NLH (immediately) and the Water Resources Division (within 24 hours) and as per the requirements of the permit to work in or near water. Spills must be reported using the Environmental Emergency Report Line. This includes but is not limited to; any spillage of fuel, lubricant, or any other material and siltation of water. See Section 7.0 – Contingency Plans for further information.

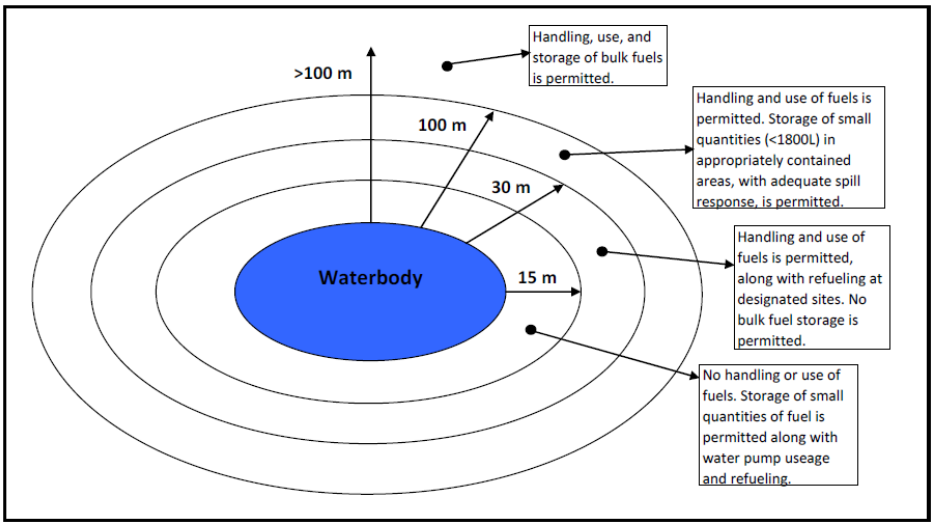

Figure 6.1 Fuel handling, use and storage near a waterbody

6.3 Waste Management

Environmental Concerns

During construction activities there will be both solid and liquid wastes, as well as human waste, generated. Solid and liquid waste (e.g., domestic waste, paper, cardboard, wood and others), if not properly controlled and disposed of, will be unsightly, may cause safety and human health concerns, and could result in conflict with wildlife and land use.

Human waste (sewage) if not properly controlled and disposed of by appropriate sanitary utilization may cause safety and human health concerns.

Environmental Protection Procedures

1. Waste reduction measures will be encouraged.

2. Waste oils and lubricants will be stored in a labelled tank or drum and disposed of at an approved facility. Other than periodic greasing of equipment there will be no servicing on the work site or laydown area. All servicing will be performed off site.
3. Solvents, acids and caustic liquid waste will be collected separately and stored for removal and disposed by a waste management company specializing in such wastes.
4. Solid waste produced by project personnel and operations will be collected and removed from the worksite on a daily basis for disposal at an approved waste disposal facility or for deposit at an appropriate reuse or recycling facility.
5. Waste material generated on site shall be collected in a proper container so that it does not pose an environmental, safety or health hazard, or cause conflict with wildlife or land users.
6. All recyclable and reusable materials will be collected and transported to appropriate facilities for recycling or reuse on a regular basis.
7. Domestic waste from the field including food waste should be gathered daily and stored for removal at approved waste disposal sites.
8. Rags used in equipment maintenance and other potentially combustible materials will be kept in a separate container from other waste materials until the combustible material can be removed from the site for disposal.
9. No waste material will be deposited in a body of water.
10. Sanitary facilities will be provided and maintained by a reputable vendor in an appropriate manner, suitable for use. Regular or as required maintenance (or swap out) system will be provided.
11. The sanitary facility will be a self-contained portable unit.

6.4 Equipment Movement

Environmental Concerns

A variety of equipment will be used on site during construction and may result in ground disturbance, leading to erosion and sedimentation issues. These issues can negatively affect environmental components such as wildlife, vegetation, surface water quality and historic resources. Noise associated with equipment operation and movement may negatively affect wildlife. Air emissions may have air quality implications. Accidental leaks or spills of fuel or other hazardous materials may affect soils, water, fish, vegetation and wildlife. Tracked equipment has the potential to disturb the ground around/at the site.

Environmental Protection Procedures

1. All approvals, authorizations and permits for project activities shall be followed.

2. Where possible existing roads should be used to supply operations, thus minimizing ground disturbances.
3. The use of heavy equipment in and near watercourses should be minimized when possible.
4. If an archaeological or cultural site is encountered or disturbed due to vehicle movement, NLH shall be notified immediately and the protection measures set out in Sections 6.14 and 7.3 should be followed.
5. Noise control procedures (Section 6.13) shall be followed during the field investigations.
6. All equipment shall have exhaust systems regularly inspected and mufflers shall be operating properly.

6.5 Working within 15 m of a Body of Water

Environmental Concerns

When carrying out construction activities near a waterbody, special care must be taken to ensure that no effluent from the work site enters the water. Soil erosion caused by construction activities can lead to stream degradation and turbidity downstream. Stream channels may become unstable as a result of the higher rates of runoff from surrounding land stripped of vegetation, and toxic wastes can impair water quality. Proper protection plans are required to minimize or eliminate sedimentation and water pollution and maintain riparian habitat near water bodies.

Environmental Protection Procedures

1. When working within 15 metres of a body of water, the ECCC must be notified and a Permit to Alter a Body of Water must be issued in accordance with the Water Resources Act. Fisheries and Oceans Canada (DFO) must also be notified and a Letter of Advice may be issued. Work shall adhere to conditions of the permit from ECCC and the Letter of Advice from DFO, if issued.
2. A joint engineering and environmental reconnaissance of the site will be completed in the early planning stages to identify all nearby bodies of water.
3. Mitigative and protective measures will be identified.
4. Where possible, the majority of the construction activities will take place during low flow and the low rainfall period.
5. Clear instructions regarding regulatory requirements and the operation of heavy equipment will be communicated to contractors and site personnel. All conditions of permits and approvals for working within 15 meters of a body of water require strict compliance.
6. Wood or slash will never be dumped into or near a body of water.
7. Any vehicles or equipment working near a body of water will be clean and in good condition.

8. Heavy equipment will be stored outside the high water mark of all bodies of water.
9. Where an acceptable biodegradable lubricant is available for a piece of equipment working within 15 m of a waterbody, the biodegradable lubricants will be used.
10. Fuels, chemicals or deleterious materials will not be stored near a body of water.

6.6 Alterations to a Body of Water/Instream Works

In water work planned for this project includes the placement of rock within the Exploits River at the location of the Goodyear's Dam. This rock will be large, clean, blasted rock that has been washed to remove loose fines, if required.

A new fishway will be constructed through blasting at the south abutment of Goodyear's Dam. This will include installation of an auxiliary water supply system, reinforced concrete walls, and safety guards. The design will include an auxiliary water supply system at the fishway entrance pool with stoplogs to provide sufficient attraction flow.

Environmental Concerns

The environmental concerns associated with alterations to a body of water include direct disturbance to, or mortality of, fish, disturbance to waterfowl, loss of fish habitat caused by infilling, sedimentation and removal of substrate, and disturbance to river bank vegetation.

Environmental Protection Procedures

1. Any work within 15 m of a waterbody , including watercourse crossings (fording, bridge crossings, etc.) shall require a permit from ECCC. A request for project review shall be submitted to DFO. Work shall adhere to conditions of the permit from ECCC and the Letter of Advice from DFO, if issued. Currently, no bridge crossings are planned.
2. All watercourses and waterbodies will be examined on a site-specific basis in order to identify areas that might require special attention and to evaluate the habitat type and species present at each watercourse, including upstream and downstream.
3. Attempts will be made to minimize the number of water crossings necessary to access the site.
4. Work will be performed in such a way as to ensure that deleterious substances including, but not limited to, materials such as sediment, fuel and oil do not enter watercourses and waterbodies.
5. Attention will be given to scheduling. The longer a stream is disturbed, more sediment will enter the watercourse. The ideal time for construction is typically during low flow, and the low rainfall period, which is generally July-October. Given the peak timing of the Atlantic Salmon run on the Exploits River, in-water work will occur in September and October, which is also outside of the Atlantic Salmon migration period.

6. In all areas, except at watercourse crossings/instream work locations, a minimum buffer of undisturbed natural vegetation (15 m from the high water mark) shall be left between the work area and the bank of any watercourse it parallels.
7. Watercourse crossings will be selected so as to minimize unnecessary tree clearing.
8. Temporary fuelling, servicing or washing of equipment in areas other than the main fuel storage site will not be allowed within 100 m of a watercourse except within a refuelling site approved by the Contractor. Conditions here will allow for containment of accidentally spilled fuels. All waste oil, filters, containers or other such debris shall be removed from the work area and properly dispose of at an approved waste disposal site.
9. Any alterations to a body of water which may impact navigation may require a Notification under Transport Canada's Navigation Protection Program.
10. When fording any watercourse, DFO will be notified and the Environmental Guidelines for General Construction Practices from ECCC (https://www.gov.nl.ca/eccc/files/waterres-regulations-appforms-chapter10.pdf) and the Water Resources Management Division will be applied. A permit to alter a body of water would be required in conjunction with the *Water Resources Act* and the following guidelines:
    - Avoid areas of spawning habitat;
    - Restrict crossings to a single location;
    - Ensure crossings are made at right angles to the watercourse;
    - Minimize equipment activity within the watercourse by limiting the number of crossings;
    - Ensure that all equipment is mechanically sound to avoid leaks of oil, gasoline and hydraulic fluids;
    - Ensure that no servicing or washing of heavy equipment occurs within 100 metres of watercourses;
    - Ensure that fording activities will not decrease the depth of the watercourses to less than 20 cm;
    - Ensure that fording activities are halted during high flow periods;
    - Stabilize all bank sections which contain loose or erodible materials. If banks must be sloped for stabilization, no material should be deposited within the watercourse. Sloping can be accomplished by back-blading, and the material removed should be deposited above the high water mark of the watercourse;
    - All fording activities will comply with the required approvals from the ECCC and DFO;
    - Equipment should be cleaned prior to entering a watercourse to minimize a potential release of contaminants into the environment;
    - Inlet and outlet areas shall be adequately protected from erosion by installing erosion prevention structures such as rip rap; and
    - The use of heavy equipment in watercourses or bodies of water shall not be permitted.

6.7 Excavation, Backfilling and Grading

Environmental Concerns

The principal environmental concern associated with excavation, backfill and grading is the potential impact on aquatic ecosystems and water quality due to runoff of sediment-laden water. Potential disturbance to rare species and habitat (Section 6.15), and archeological/ historic resources (Section 6.14) must also be taken into consideration, along with the effect on forests, side hills and steep slopes (i.e. danger trees or wind falls).

Environmental Protection Procedures

1. Work will be conducted in a manner that ensures the minimum amount of disturbance necessary.
2. All works in the vicinity of waterbodies or watercourses will be performed in strict compliance with NL ECCC and DFO guidelines and requirements. Work will be conducted in a manner that controls potential sedimentation of watercourses and waterbodies in or adjacent to the work areas.
3. Excavation, backfilling and grading will be done only upon completion of grubbing and stripping. Where engineering requirements do not require grubbing and stripping (e.g., within the buffer zone of a stream crossing), filling will occur without any disturbance of the vegetation mat or the upper soil horizons.
4. Excavation, backfilling and grading in the vicinity of stream crossings will be done in a manner that ensures that erosion and sedimentation of watercourses and waterbodies is minimized and is done in strict compliance with NL ECCC and DFO guidelines and requirements.
5. A buffer zone as outlined in Sections 6.5 and 6.6 will be maintained between construction areas and all watercourses.
6. Section 6.2 will be followed for all fuel related activities associated with excavation, backfilling and grading activities.

6.8 Erosion Prevention and Sediment Control

Environmental Concerns

The potential for erosion and resulting effects to water quality and fish and fish habitat is a key environmental concern associated with construction activities.

Environmental Protection Procedures

Erosion prevention and sedimentation control will be a main objective in all work areas where soil may be transported by water, wind or ice. The application of erosion control measures is found throughout the activities listed throughout Section 6.0 but reiterated here to provide a thorough evaluation of site specific activities required by the Contractor and project personnel.

General

The most effective way to control erosion and sedimentation is to avoid activities that lead to it. All areas of exposed soil are to be stabilized by grading to meet slope requirements. Where erosion along an exposed slope is a concern, and sufficient vegetation does not exist to act as a buffer between the high water mark of the waterbody and the exposed soil, a silt fence will be constructed to control sediment runoff.

Engineering requirements will vary depending on the locations of the silt fence and will take factors such as drainage/surface area of exposed soils into consideration.

Contractors will use erosion and sedimentation control measures to ensure water control on site. Any water discharge into a waterbody, watercourse, or ecologically sensitive area, due to construction activities will comply with applicable discharge guidelines as presented in the Newfoundland and Labrador *Environmental Control Water and Sewer Regulations* under the *Water Resources Act*.

Watercourses

In water work planned for this project includes the placement of rock within the Exploits River at the location of the Goodyear's Dam. This rock will be large, clean, blasted rock that has been washed to remove loose fines. Settling basin(s) will be constructed in the quarry in the rock washing area to remove fines from wash water prior to discharge from the quarry. The approved quarry location will be a minimum of 200 meters from any natural watercourses and the water discharged from the wash water settling basins will be directed to a vegetated area, or road drainage ditches, to allow for further filtering of sediment.

A new fishway will be constructed through blasting at the south abutment of Goodyear's Dam. This will include installation of an auxiliary water supply system, reinforced concrete walls, and safety guards.

Exposure of Erodible Soils

Areas with existing vegetative cover will be developed as part of the work program. These are;

- Laydown areas
- The site of the proposed new fishway on the south abutment of Goodyear's Dam

At these sites existing vegetation will be cut, overburden will be pushed back, and the areas will be graded to allow for equipment movement. The following actions will be taken to minimize the erosion of exposed soils and the discharge of suspended sediment in runoff waters leaving these sites:

- preliminary site reconnaissance indicates that no natural streams flow through the laydown areas to be developed, however, if a natural watercourse is found in these areas, a minimum 30 metre buffer will be left adjacent to the stream bank in which no overburden will be removed;
- overburden from the cleared areas will be stockpiled in windrows on the upslope sides to divert rainwater flows from non-cleared areas away from areas of exposed soils;
- the downslope side of each area will be ditched suitably to allow for the capture of surface drainage water flowing over the exposed soils;

- sediment control basins/traps will be established within the downslope ditches, accumulated sediment will be removed as required to maintain retention capacity, and the structures stability will be checked regularly and repaired as required to maintain effectiveness;
- the Total Suspended Solid (TSS) content of construction-altered water that is released into a natural waterbody will not exceed 30 milligrams per litre[1] and be in compliance with *Environmental Control Water and Sewage Regulations*, 2003;
- a TSS sampling and analysis program will be implemented to document levels of TSS in water discharged from the main rock stockpile area near the Goodyear's Dam worksite and allow for adjustment of the sediment traps established in the drainage ditching in this area if required to comply with TSS control requirements. Sampling stations will be identified upstream in the Exploits River, at the point of discharge of runoff from the laydown area into the Exploits River, and at a point downstream of the discharge point. Samples will be taken at each station at a frequency agreed with regulators and may be increased during periods when higher sediment discharge may be expected, i.e. storm events, to monitor compliance.

6.9 Blasting

Environmental Concerns

The general environmental concerns associated with on-land blasting include:

- Destruction of vegetation outside excavation limits;
- Noise disturbances to wildlife;
- Disturbance of Archaeological Resources; and
- Dust generation.

Blasting in or near waterbodies can affect fish and the introduction of sediment into the water column is also a concern for water quality and related effects on aquatic life.

Environmental Protection Procedures

The handling, transportation, storage and use of explosives and all other hazardous materials will be conducted in compliance with all applicable laws, regulations, orders of ECCC and Government Services, the *Explosives Act*, and the *Transportation of Dangerous Goods Act*.

The following measures will be implemented to minimize the potential effects of blasting:

1. Explosives will be used in a manner that will minimize damage or defacement of landscape features, trees, ecologically sensitive areas such as wetlands, and other surrounding objects by controlling through standard best practice (including precisely calculated explosive loads and adequate stemming), the scatter of blasted material beyond the limits of activity. Outside of cleared areas,

[1] If water is being abstracted from a watercourse, used, treated and subsequently returned to the same watercourse, these solids data mean that the effluent should not contain more than 30 milligrams per litre more than was in the water originally abstracted.

inadvertently damaged trees will be cut, removed, and salvaged if merchantable. Fly rock that inadvertently enters a waterbody watercourse or any ecologically sensitive area, and that can be recovered without further damage to the environment will be removed. Instances where larger fly rock (boulders) enters these areas or deep waterbodies, recovery of this will be discussed with NLH, who will decide whether or not it is practical to proceed.

2. Blasting patterns and procedures will be used which minimize shock or instantaneous peak noise levels.
3. Time delay blasting cycles or blasting mats will be used, if necessary, to control the scatter of blasted material.
4. Blasting will not occur in the vicinity of fuel storage facilities.
5. All blasters will have a Blaster's Safety Certificate from the Department of Jobs, Growth and Rural Development (Apprenticeship and Trades Certification Division). This certificate and a Temporary Magazine License will be obtained prior to drilling and blasting.
6. Use of explosives will be restricted to authorized personnel who have been trained in their use.
7. There will be a separate magazines on site for explosives and for dynamite blasting caps. All temporary magazines for explosive storage will have appropriate approvals.
8. The immediate area of the blast site will be surveyed within one hour prior to a blast and operations will be curtailed if wildlife (e.g. black bears, water fowl etc.) is observed within 500 m. Environmental personnel will conduct pre-blast monitoring to see and identify species of concern. Additionally, any individual animal sightings by other personnel will be reported to the Construction manager.
9. All blasting debris such as explosive boxes and used blasting wire must be collected for proper disposal as soon as possible following blasting activity.
10. If blasting is necessary within the vicinity of an archaeological site, precautions will be taken to ensure that blasted material and shock waves do not disturb any part of the site. If necessary, protective covering will be applied to the site under the supervision of an approved archaeologist. Blasting will not be undertaken in these areas without first notifying the Construction Manager.

6.10 Noise

Environmental Concerns

Noise associated with equipment operation may cause negative effects on fish and wildlife and affect human safety and health. All necessary precautions should be taken to minimize potential effects.

Environmental Protection Procedures

1. All equipment will be equipped with properly operating mufflers and exhaust systems which will be regularly inspected.

2. Wildlife surveillance will be conducted prior to noisy activities.
3. Project personnel will adhere to all permits and approvals.
4. All safe work procedures relating to noise will be followed by project personnel in accordance with the project-specific Health and Safety Plan.

6.11 Historic & Archaeological Resources

Environmental Concerns

Any field work has the potential to impact historic and archaeological resources. Known sites of historic or archaeological significance must be identified in the general area of project activities, and “no-go” buffer zones must be established around these.

As per the requirements of the Provincial Archaeology Office (PAO), a Historic and Archaeological Resources Assessment must be conducted at sites where historic and archeological resources may be unearthed.

Existing information will be provided where available and where required NLH will coordinate an historic resources review. The results of the review will be incorporated into the EPP.

Environmental Protection Procedures

All field personnel should be informed of the historic and archaeological resources in the area and of their responsibility to report any unusual findings and to leave such findings undisturbed.

In case of the discovery of an archaeological site or artifact the following procedures will apply:

1. Under the provincial *Historic Resources Act* (1985), all archaeological sites and artifacts are considered the property of the Crown, and must not be disturbed. The Contractor should take all reasonable precautions to prevent employees or other persons from removing or damaging any such articles or sites and may be held liable for prosecution under Section 35.1 and 35.2 of the provincial *Historic Resources Act* (1985) for all contravention. Personnel working in the vicinity should be advised of the find, and the site area should be flagged for protection and avoidance.
2. All work should cease within 20 m of the discovery until NLH advises the PAO of the discovery. The PAO, in consultation with NLH, should provide direction regarding the discovery and may authorize a resumption of the work. If required, a full archaeological assessment should be conducted of the site and immediate area.
3. Archaeological materials encountered should be reported initially to the site manager, and immediately thereafter to the Provincial Archaeologist at PAO with the following information:
    - Nature of activity;
    - Nature of the material discovered;
    - Precise location of the find.

4. The PAO should assess the significance of the discovery and determine if mitigation is required. The PAO should develop mitigation measures and advise NLH of any such decisions.
5. Regular monitoring should be conducted to ensure that site protection measures are adequate and that the terms and intent of the EPP requirements are being met.

6.12 Wildlife Protection

Environmental Concerns

Wildlife refers to all plant and animal life, introduced or native, aquatic or terrestrial, in Newfoundland and Labrador.

It is possible that threatened, endangered and protected species of plants and animals will be present in areas where the field program will be completed. Many wildlife species and their habitats are protected under provincial and federal regulations such as the federal *Species at Risk Act* and the Newfoundland and Labrador *Endangered Species Act*. Of primary concern are habitat disturbance, physical disturbance to plant species, displacement of animal due to encounters with equipment and personnel, and noise impacts (for animal species).

Environmental Protection Procedures

1. Through site surveys, existing and potential rare plant habitat will be identified and mapped prior to the commencement of any site work. Based on this mapping, travel routes and “no-go” zones should be established to avoid sensitive areas. Animals and animal habitat, such as raptor nests and beaver dams, will also be identified and mapped.
2. Work plans should be submitted in advance and shall be reviewed for potential conflicts.
3. Where required, prior to commencement of work an on-site wildlife biologist must be on-site to lay out approved travel routes and work areas that will easily identify trails and limits of the work area where there is potential for endangered species to be present.
4. The Contractor should arrange a session for all work crew members prior to working on site to ensure they are aware of all wildlife concerns identified, work methods and any “no-go” zones on site. All site personnel should receive training to recognize any endangered or threatened species of plant or animals and its habitat prior to the start of any clearing.
5. There should be no intrusion into “no-go” zones without prior permission of the Contractor and regulators.
6. Crews should not travel outside of marked work areas and trails. If markers are not clear or missing, or if questions regarding sensitive areas exist, the Contractor should be consulted prior to commencing or continuing with the work.
7. The Contractor shall monitor work activity in sensitive sites at all times and provide advice on access and travel requirements.

8. Disturbance on the worksites shall be kept to the minimum required to complete the work.
9. The Contractor should notify any regulators as to the activity proposed near sensitive areas prior to the commencement of the work and upon completion of the work.
10. Any potential impacts to rare or protected species and their habitat at the job site should be forwarded to NLH immediately for evaluation. This includes, but is not limited to, leaks of fuels, oils or hydraulics, or other contaminants at the work site and any travel outside of the approved routes.
11. Consult NLH if beavers or beaver habitat is encountered.
12. It is deemed that Black Bear Monitors are not required at this location.
13. Regarding the new fishway, a fish passage monitoring program will be developed, reviewed and approved by DFO. The monitoring measures shall document the success of the new fishway prior to decommissioning the existing fishway to avoid any disruption to fish migration. The proposed monitoring program will include methods such as video and radio telemetry. The overall schedule will be finalized upon review and consultation with DFO.

6.13 Abandonment of Work Sites

Environmental Concerns

Abandonment of work sites may cause disruption to wildlife and land users. Work sites must be returned to a condition as close as possible to what they were before work began.

Environmental Protection Procedures

1. No buildings or structures associated with the work should be left at the site on completion of the work.
2. All solid wastes, including petroleum, oil and lubricant containers will be removed from the site and disposed of at an approved waste management facility. Recyclable and reusable materials will be transported to appropriate facilities for recycling or reuse.
3. Notification (72 hours) will be given to NLH before abandoning work sites.
4. All work sites will be subject to an inspection by NLH and others.
5. All excavations will be backfilled with excavated material upon completion. Organic material will be saved and reinstated as surface cover.
6. No debris, including slash, should be permitted to enter any body of water.

7. CONTINGENCY PLANS

7.1 Fuel and Hazardous Material Spills

Environmental Concerns

Fuel and hazardous materials can be damaging to vegetation, soil, surface water, ground water, wildlife, aquatic organisms, historic resources and human safety and health. Any spill or leak regardless of quantity, that has the potential to contaminate nearby property or enter a body of water or sewer is considered a hazardous material spill.

Environmental Protection Procedures

In the event of a fuel or hazardous material spill, the following procedures will apply:

1. The individual who discovers the leak or spill shall make a reasonable attempt to immediately stop the leakage and contain the flow if it is safe to do so.
2. Any spill or leak of fuel shall be reported immediately to Contractor. Spill location, type of fuel or hazardous material, volume and terrain condition at the spill site should be determined and reported to NLH.
3. Any spill or leak of fuel, in a waterbody or has the potential to enter a waterbody or, 70 L or more on land, should be reported immediately to NLH, and reported to the 24-hour Environmental Emergency Hotline (1-800-563-9089 or 709-772-2083) which is operated jointly by Environment Canada, the Canadian Coast Guard, and the Provincial Government. Required information includes:

    - Name of reporter and phone number;
    - Time of spill or leak;
    - Time of detection of spill or leak;
    - Type of product spilled or leaked;
    - Amount of product spilled or leaked;
    - Location of spill or leak;
    - Source of spill or leak;
    - Type of accident - collision, rupture, overflow, other;
    - Owner of product and phone number;
    - If the spill or leak is still occurring;
    - If the spill or leaked product is contained, and if not, where it is flowing;
    - Amount and type of containment material on site;
    - Wind velocity and direction;
    - Temperature;
    - Proximity to waterbodies, water intakes, and facilities;
    - Snow cover and depth, terrain, and soil conditions.

4. The Contractor should take immediate action as the "on-scene-commander" for the purposes of containing and/or cleaning up a fuel or hazardous materials spill. She/he has full authority to take necessary and appropriate action without unnecessary delay. Overall responsibility for coordinating a cleanup and maintaining this contingency plan rests with the Contractor.

5. The following cleanup equipment will be available:

    - 45 gallon drum spill kit at each piece of fuel consuming equipment
    - 45 gallon drum spill kit located at chemical storage area

6. In reaching decisions on containment and clean-up procedures, the following criteria will be applied:

    - Minimize danger to persons;
    - Protect water supplies;
    - Minimize pollution of watercourses;
    - Minimize area affected by spill;
    - Minimize the degree of disturbance to the area and watercourses during clean up.

7. The on-scene-commander will act in consultation with NLH, and the regulating authorities to:

    - Assess site conditions and environmental effects of cleanup procedures;
    - Deploy on-site staff to mobilize pumps and empty 205 L drums or other appropriate storage containers to the spill site;
    - Deploy on-site staff to build containment dykes and commence pumping contaminant into drums;
    - Apply absorbent as necessary;
    - Dispose of all contaminated debris, cleaning materials and absorbent by placing it in an approved land-fill site;
    - Take all necessary precautions to ensure that the incident does not recur.

The on-scene-commander will be responsible for preparing a written report (including photographs) which will be sent (as soon as possible and no later than 30 days after the spill) to NLH, and from there to Government Service Centre and Environment Canada’s Emergency Response Coordinator (Appendix E).

7.2 Wildlife Encounters

Environmental Concerns

As a protection measure, hunting, trapping or fishing by Project Personnel is not permitted. Firearms and ammunition are not permitted at the work site unless authorized by NLH and government regulators for use as protection against wildlife.

This contingency plan is aimed at providing Project Personnel with practical information to:

- Avoid bears and other potentially dangerous animals;
- Prevent injuries; and

- Avoid harming wildlife.

Environmental Protection Procedures

Prevention

The following procedures relating to food preparation, storage and waste disposal will be implemented:

1. Site and working areas will be kept clean of food scraps and garbage;
2. No personal pets, domestic or wild, will be allowed at the work sites or facilities;
3. Solid waste will be collected on a daily basis for disposal and taken to an approved waste management facility. Recyclable and reusable materials should be transported to appropriate facilities for recycling; and
4. Project Personnel will follow safe work practices that minimize the safety and health risks associated with wildlife encounters. Project Personnel will be oriented to and follow the Safety, Health and Emergency Response Plan.
5. Inspections of work areas may be carried out in addition to regular inspections by NLH or its designate, his/her delegate, or representatives of regulatory agencies.

Response Actions

1. All Project Personnel should abide by the following rules in cases of wildlife encounters:
2. No attempt should be made to chase, catch, divert, follow or otherwise harass wildlife by aircraft, vehicle or on foot by any person at a work site or while on Project business;
3. Equipment and vehicles will yield the right-of-way to wildlife;
4. Project Personnel will be aware of the potential for encounters with wildlife and be instructed to immediately report all sightings to the Contractor. The Contractor will notify NLH;
5. If nuisance animals are identified, the Contractor is responsible for all subsequent actions. Responsive actions will be determined by the Contactor, in consultation with NLH and the ECCC Wildlife Division. All actions will comply with NL ECCC Wildlife Division regulations and permits;
6. Any incidents that result in the displacement or killing of wildlife will be reported to NLH, complete with details on the incident and the names (and contact numbers) of the persons involved;
7. Project Personnel will not attempt to feed any wildlife;
8. Field personnel and supervisors will be supplied with bear deterrents such as bangers or spray.

How to React to a Bear Encounter

The following precautions must be taken when working in areas known to be inhabited by bears and other potentially dangerous animals:

1. Everyone should keep an eye out for bears;

- Select a route that is open and well cleared, if possible;
- Be aware of the wind direction and walk with the wind whenever you can;
- Don't investigate bad smells, as bears are usually attracted to them;
- Have binoculars readily available to help spot bears from a safe distance.

2. When designing a rest spot, avoid sites with a history of bear problems. Check with the Wildlife Officer and local residents to obtain details and advice.

3. Bears normally avoid encounters with humans. However, there is always a possibility you may surprise a bear at close range or meet a bear which is not afraid of people. There is no guaranteed method for reacting to a bear encounter because each encounter is different. However, the following guidelines can help minimize the risk:

    - Assess the situation and think about your surroundings before you react;
    - Try to stay calm and keep the bear in sight at all times;
    - If traveling in a group, stay close together;
    - Do not run unless you are reasonably sure you can reach a safe place before the bear catches you. Running may invite the bear to pursue you and a bear can run faster than a human;
    - Continue to walk slowly in the opposite direction from the bear;
    - In close confrontations, the bear is likely to feel threatened. Its natural tendency is to remove the threat. Try to act as non-threatening as possible, particularly if it is an adult bear or a female with young. Do not make direct eye contact;
    - Give the bear an opportunity to leave; make sure it has an escape route.

How to React to a Coyote Encounter

- Stay calm.
- Back away slowly while facing the animal.
- Leave the coyote a way to escape.
- Raise your voice and speak firmly.
- If the coyote approaches or acts aggressively, wave your arms and make yourself look larger. Shout, make noise and throw any available objects.
- In the unlikely event that you are attacked by a coyote, fight back. Try to remain standing and use rocks, sticks, tools and your hands to fend off the attack. Keep the animal away from your neck and head.

7.3 Historic & Archaeological Resources

Environmental Concerns

Historic and Archaeological Resources are valued by Aboriginal people and the public at large for their intrinsic value and for the information they provide on the pre-contact and historic human activity in the province.

The management and protection of Historic and Archaeological Resources falls under the mandate of the Provincial Archaeology Office (PAO) of the Newfoundland and Labrador Department of Tourism, Culture, Arts and Recreation. The PAO administers its mandate through the Newfoundland and Labrador *Historic Resources Act* (1985), which has its own distinct regulatory requirements, in addition to those of the broader environmental assessment process.

Project Personnel are not permitted to knowingly disturb or destroy historic resources, including excavating archaeological sites and collecting artifacts. Project Personnel will take all reasonable precautions to prevent persons from removing or damaging any such articles or sites and may be held liable for prosecution under the provincial *Historic Resources Act* (1985) for all contraventions.

Any work which involves ground disturbance, such as operation of heavy equipment, trenching, cutting and clearing, requires historic resources assessment and clearance prior to beginning the activity. A review of Historic and Archaeological Resources information should be conducted, along with a Historic and Archaeological Resources Assessment.

Environmental Protection Procedures

There is always the possibility that undiscovered archaeological sites such as structures, tools, butchered animal bones and graves may be discovered or disturbed during drilling and data collection activities. As a result, all personnel involved in these activities will be informed of their responsibility to report any suspected findings. In the event of an inadvertent discovery of a pre-contact or historic artifact or site, the following procedures apply:

1. Under Sections 35.1 and 35.2 of the *Historic Resources Act* (1985), all Historic and Archaeological Resources discovered, including archaeological objects and sites of archaeological and/or historic interest or significance, would be deemed the property of the Crown and must not be disturbed. Reasonable precautions will be taken to prevent employees or other persons from removing or damaging any such articles, artifacts or sites
2. All work should cease in the immediate area of the discovery until the proponent has consulted with the PAO and is authorized to resume work.
3. Archaeological materials encountered should be reported to the Construction Site Manager, who will then immediately notify the PAO at (709) 729-2462 with the following information:
    - Nature of activity resulting in the find;
    - Nature of the material discovered;
    - The precise location of the find.
4. Discoveries, or suspected discoveries, of historic resources should be flagged or marked with a bright colored object in the field and the area protected as required.

Following an assessment of the significance and mitigation needs, a report will be made to NLH and the PAO. Any proposed mitigation will first be accepted by NLH and approved by the PAO.

7.4 Species at Risk/Breeding Migratory Birds

Environmental Concerns

Prior to commencement of any field work, an appropriate specialist (accepted by NLH) should survey the site to identify the presence or absence of any threatened or endangered species of plants or animals and migratory bird nests. If rare plants or migratory bird nests are identified, the specialist should clearly mark access routes for equipment and personnel.

Environmental Protection Procedures

During initial site and access road development, effort shall be made to ensure that loss or disturbance of any rare species and their habitat is avoided or mitigated.

If any endangered species or migratory bird nests are identified in the area of project activities, all work should cease within 30 m of the discovery. The Contractor should contact NLH, who should then advise the NL ECCC and Canadian Wildlife Service of the discovery. The site area should be flagged for protection and avoidance. The NL ECCC, in consultation with NLH, shall provide direction regarding the discovery.

Some nests such as that of the pileated woodpecker are protected under the *Migratory Birds Convention Act*. These nests are protected all year round and require special management measures. All protection measures will be implemented as outlined in the *Migratory Birds Convention Act*.

Any potential impacts to rare or protected species and their habitat, or migratory bird nests at the site should be forwarded to NLH immediately for evaluation. This includes, but is not limited to, leaks of fuels, oils or hydraulics, or other contaminants at the site.

7.5 Forest Fires

Environmental Concerns

There are a number of field activities that could result in a fire which could in turn spread to the surrounding area. Forest fires pose safety and health risks and could negatively affect wildlife and vegetation.

Environmental Protection Procedures

The fire prevention and fire-fighting procedures described below will be followed and Project Personnel will take all precautions necessary to prevent fire hazards when at the work sites such as ensuring the disposal of all flammable waste on a regular basis.

In the event of a forest fire, the Contractor or other Project Personnel will take immediate steps to contain or extinguish the fire to the extent practical and safe.

Fires will be reported immediately to the nearest Forest Management Unit office (Appendix E) and to NLH. The following information will be provided:

- Name of the reporter and phone number;

- Time of detection of the fire;
- Size of the fire;
- Location of the fire.

Sufficient firefighting equipment to suit the labour force and fire hazards should be provided. Equipment shall be provided as specified in the *Forest Fire Regulations* and Operating Permit and will include shovels, back tanks and axes. Such equipment will comply with and be maintained to the manufacturer's standards. Project Personnel will be trained in the use of such equipment.

During the fire season, machinery and equipment will be equipped with a fire extinguisher containing a minimum of 4.5 kilograms of ABC dry chemical.

A person shall not carry out a logging or industrial operation on forest land during the forest fire season unless the logging or industrial operation is carried out under an operating permit issued by the forest service.

The forest fire suppression equipment referred to in the operating permit shall be provided at the operating site in the following ratio:

Employees	Backpack tanks, axes or Pulaski tools and grubbers or shovels
5 or less	1
6– 10	2
11 – 15	3
16 – 20	4
Over 20	Add 1 back tank pump, 1 axe or Pulaski tool and 2 grubbers or shovels to the above figure for each group of 5 additional employees or fraction of that number of employees. The back tank pump must have a capacity of 20 litres and be of a type approved by the forest service.

When the number of employees reaches 20 or over, one fully functional forest fire pump such as the Wajax Mk3 shall be available at the site. Pump accessories shall include: a gated "Y" valve, hose strangler and two nozzles for each unit, additionally, 610 meters of forest fire hose shall be available for each unit. Forest firefighting equipment shall be forest service approved.

The forestry official issuing the operating permit may specify deviations from the equipment requirements should local operating conditions warrant deviations. The actual location of the forest fire suppression equipment in relation to the operating site may be designated by the forestry official issuing the permit.

A copy of the operating permit shall be on the operating site and shall be shown when requested by a forestry official. The operating permit may be temporarily suspended by a forestry official if the fire weather index for that locality rises to high or extreme. Where a forest fire occurs on forest land in an area where logging or industrial operations are being carried out the person/s carrying out the

operations shall immediately notify the nearest forest management district office or ranger station and commence fighting the fire with all labour, materials, equipment and facilities at his or her disposal until relieved of this responsibility by a forestry official or the fire is extinguished.

A

Permits and Approvals

Appendix A – Permits and Approvals

List of Potentially Applicable Permits and Authorizations (Provincial, Federal, Municipal)

Approval Potentially Required	Legislation / Regulation	Project Component / Activity Requiring Approval or Compliance	Department or Agency	Requirements
Government of Newfoundland and Labrador				
Permit for any Alteration to a Body of Water	*Water Resources Act*	Any activities which may alter a waterbody	Water Resources Management Division, Department of Environment, Conservation and Climate Change	Permits are required for construction activities within 15 m of the high watermark of any waterbody. An application form is required for each alteration.
Water Use License	*Water Resources Act*	Extraction of water from a surface or groundwater source	Water Resources Management Division, Department of Environment, Conservation and Climate Change	Approval is required to extract water from a surface or groundwater source for subsequent use.
Policy Directives	*Water Resources Act*	Project activities (as applicable)	Water Resources Management Division, Department of Environment, Conservation and Climate Change	The Department has a number of potentially applicable policy directives in place for particular types of in or near water work
Cutting Permit	*Forestry Act*	Clearing of trees from fishway and laydown areas	Department of Forestry, Agriculture and Lands	A cutting permit is required from the local Forestry office
Operating Permit	*Forest Fire Regulations*	Equipment use during forest fire season	Forestry Division, Department of Natural Resources	ATVs and equipment must comply with exhaust spark reduction requirements.
Compliance Standard	*Fire Prevention Act, and*	On-site structures (temporary or permanent)	Engineering Services Division, Digital Government and	All structures must comply with fire prevention standards.

Approval Potentially Required	Legislation / Regulation	Project Component / Activity Requiring Approval or Compliance	Department or Agency	Requirements
	Fire Prevention Regulations		Service NL	
Quarry Permit	*Quarry Materials Act and Regulations*	Extracting borrow material	Mineral Lands Division, Department of Natural Resources	A permit is required to dig for, excavate, remove and dispose of any Crown quarry material.
Compliance Standard	*Environmental Control Water and Sewage Regulation under the Water Resources Act*	Any waters discharged from the Project	Pollution Prevention Division, Department of Environment, Conservation and Climate Change	A person discharging sewage and other materials into a body of water must comply with the standards, conditions and provisions prescribed in these regulations for the constituents, contents or description of the discharged materials.
Compliance Standard	*Occupational Health and Safety Act and Regulations*	Project-related occupations	Digital Government and Service NL	Outlines minimum requirements for workplace health and safety. Workers have the right to refuse dangerous work. Proponents must notify Minister of start of construction for any project greater than 30 days in duration.
Compliance Standard	*Workplace Hazardous Materials Information System (WHMIS) Regulations, under the Occupational Health and Safety Act*	Handling and storage of hazardous materials	Operations Division, Digital Government and Service NL	Outlines procedures for handling hazardous materials and provides details on various hazardous materials.
Permit to Occupy Crown Lands	*Lands Act*	Use of laydown area	Crown Lands Division, Department of Municipal and Inter-governmental Affairs	A permit is required to occupy crown lands.

Approval Potentially Required	Legislation / Regulation	Project Component / Activity Requiring Approval or Compliance	Department or Agency	Requirements
Government of Canada				
Applications for Authorization under Paragraph 35(2)(b) of the Fisheries Act	*Fisheries Act and Regulations*	Project activities in or near water	Department of Fisheries and Oceans	This federal legislation provides protection to commercial, recreational, and Aboriginal fisheries by protecting the fish resources and habitats that support these activities. Any potential serious harm to fish as a result of a project that results in the death of fish or the permanent alteration to, or destruction (PAD) of, fish habitat as determined by DFO requires authorization under Section 35(s) of the Fisheries Act, including adequate and appropriate measures to offset any such serious harm. Proponents may prepare and submit a request for review to DFO to determine/ confirm whether or not such an approval is needed.
Request for Review	*Fisheries Act and Regulations*	Fishway	Department of Fisheries and Oceans	The RFR process is designed to ensure that projects comply with the *Fisheries Act* and the Species at Risk Act. It helps to evaluate how proposed activities may affect aquatic environments and species, ensuring that necessary precautions are taken to protect fish

Approval Potentially Required	Legislation / Regulation	Project Component / Activity Requiring Approval or Compliance	Department or Agency	Requirements
				habitats.
Compliance Standard	*Fisheries Act, Section 36(3), Deleterious Substances*	Any run-off from the project site being discharged to receiving waters	Environment Canada Department of Fisheries and Oceans	Environment Canada is responsible for Section 36(3) of the Fisheries Act. However, DFO is responsible for matters dealing with sedimentation. Discharge must not be deleterious and must be acutely non-lethal.
Compliance Standard	*Migratory Birds Convention Act and Regulations*	Any activities which could result in the mortality of migratory birds and endangered species and any species under federal authority	Canadian Wildlife Service, Environment Canada	Prohibits disturbing, destroying or taking a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird, and possessing a live migratory bird, carcass, skin, nest or egg, except when authorized by a permit. The Canadian Wildlife Service should be notified about the mortality of any migratory bird in the project area.
Municipalities				
Approval for Waste Disposal	*Urban and Rural Planning Act, 2000, and Relevant Municipal Plan and Development Regulations*	Waste disposal	Community Council	The use of a community waste disposal site in Newfoundland and Labrador by proponents/contractors to dispose of waste requires municipal approval. Restrictions may be in place as to what items can be disposed of a municipal disposal site.
Permit to Occupy	*Occupancy and Maintenance*		NL Government	Any new or vacant dwellings may require a

Approval Potentially Required	Legislation / Regulation	Project Component / Activity Requiring Approval or Compliance	Department or Agency	Requirements
	regulations (CNLR 1021/96)			permit

B

Revision Request Initiation Form

Appendix B – Revision Request Initiation Form

REVISION REQUEST INITIATION FORM
SECTION TO BE REVISED:
NATURE OF REVISION:
RATIONALE FOR REVISION:
SUBMISSION:

Please submit request to NL Hydro

C

Revision Control Record

Appendix C – Revision Control Record

Revision Control Record

EPP Section	Revision Date	EPP Holder's Signature

D

NL Hydro Environmental Policy

Appendix D – NL Hydro Environmental Policy

Newfoundland and Labrador Hydro

Environmental Policy and Guiding Principles

At Newfoundland and Labrador Hydro (Hydro) we are committed to being an Environmental Leader. We will help sustain a diverse and healthy environment for present and future Newfoundlanders and Labradorians by maintaining a high level of environmental compliance, responsibility and performance.

To succeed in our goal the following guiding principles have been established:

Awareness: We foster the environmental consciousness of employees and are committed to environmental compliance. We engage with identified interested parties, support stewardship in the community and participate in environmental research and development.

Environmental Management: We maintain an Environmental Management System to respond effectively to environmental emergencies and to manage, avoid or mitigate biophysical and socioeconomic effects for all of our activities and facilities.

Sustainability: We are committed to climate change management and adaptation and the efficient use of resources including the promotion of efficient use of electricity through internal and external programs. We apply a life cycle approach to planning and engineering, design, procurement and execution.

Leadership: We are committed to environmental stewardship through active leadership that promotes the identification of opportunities for continual improvement, establishes environmental targets and monitors and reports on environmental performance.

JENNIFER WILLIAMS
President and CEO, Newfoundland and Labrador Hydro

Date: January 6, 2025

newfoundland labrador hydro

E

Contact List

Appendix E – Contact List

Project Name/Number Goodyear's Dam Life Extension Project / CA0061256.6565

Location Grand Falls - Windsor, NL

Prime Contractor

Agency	Phone Number	Location
NL Hydro, Hydro Project Manager	709-733-5261 709-743-1089	St. John's, NL
NL Hydro, Exploits Generation Manager	709-489-5186 709-486-1491	Grand Falls – Windsor, NL
NL Hydro, Site Representative	709-693-6718	St. John's and Grand Falls-Winsor, NL
Consultant Project Manager (TBD)	-	NL
Contractor Technical/Construction Manager (TBD)	-	NL
Contractor HSE Coordinator (TBD)	-	NL
Environment and Climate Change Canada Environmental Protection District Environmental Emergencies Coordinator	709-772-4285	NL
Fisheries and Oceans Canada Area Habitat Coordinator	709-772-4423	St. John's, NL
Newfoundland and Labrador Department of Environment and Climate Change Environmental Emergencies	1-800-563-9089 709-772-2083	St. John's, NL
Canadian Coast Guard 24-hour Pollution Line (Atlantic Region)	1-800-565-1633 (24 hrs)	St. John's, NL

Agency	Phone Number	Location
Canadian Coast Guard Air Search and Rescue Coordination Center	1-800-563-2444 709-772-5151	Halifax, NS
Newfoundland and Labrador Department of Tourism, Culture and Recreation Provincial Archaeology Office	709-729-2462 709-729-4142	St. John's, NL
Newfoundland and Labrador Government Services Occupational Health and Safety Division (Accident Reporting) WHSCC Environmental Emergency	709-729-4444 1-800-563-5471 (24 hrs) 709-778-1000	NL
Newfoundland and Labrador Newfoundland and Labrador Department of Environment and Climate Change Water Resources Management Division Grand Falls – Windsor Regional Office	709-292-4997	Grand Falls-Windsor, NL
Department of Forestry, Agriculture and Lands Forestry, Wildlife and Enforcement Branch	1-877-820-0999	Corner Brook, NL
Forest Fire Reporting	1-866-709- FIRE(3473)	NL

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