Newfoundland and Labrador Hydro
Hydro Place. 500 Columbus Drive
P.O. Box 12400. St. John's. NL
Canada A1B 4K7
t. 709.737.1400 I f. 709.737.1800
nlhydro.com

July 14, 2026

Board of Commissioners of Public Utilities
Prince Charles Building
120 Torbay Road, P.O. Box 21040
St. John's, NL A1A 5B2

Attention: Mike McNiven
Board Secretary

Re: 2027 Capital Budget Application

Please find enclosed Newfoundland and Labrador Hydro's ("Hydro") 2027 Capital Budget Application ("Application"). Hydro's Application complies with the guidelines and conditions for capital budget proposals outlined by the Board of Commissioners of Public Utilities ("Board") in Order No. P.U. 7(2002–2003), as well as the provisional Capital Budget Application Guidelines issued by the Board.[1]

Through this Application, Hydro is seeking approval of $156.4 million in capital expenditures for 2027. This is comprised of single-year programs and projects for 2027, 2027 expenditures for multi-year proposals commencing in 2027, and 2027 expenditures for programs and projects approved in previous capital budget applications.

Hydro notes that the total planned capital spend for 2027, as outlined in the five-year capital plan, is $175.3 million.[2] This includes expenditures for 2027 previously approved through applications made supplemental to the 2026 Capital Budget Application and expenditures related to applications that Hydro anticipates filing subsequent to this Application, once full analysis has been complete. It also includes $1.8 million in specifically assigned customer contributions, applied for within this Application.

This amount does not include the anticipated capital expenditures for 2027 related to Major Project applications that have been approved or are underway. Hydro anticipates spending approximately $370.3 million on Major Projects in 2027.[3]

Further details regarding the total planned capital spend are provided in Section 6 of Schedule 1 to the Application. Certain projects proposed within Hydro's Application are related to assets that serve only one Hydro customer; in those circumstances, Hydro is seeking approval to request contributions from the customers towards the costs of the improvements to the related property. Hydro is also seeking approval of its 2025 Average Rate Base in the amount of $2,486,782,000, as detailed in Schedule 6 to the Application.

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[1] "Capital Budget Application Guidelines (Provisional)," Board of Commissioners of Public Utilities, January 2022.
[2] Hydro's total anticipated capital expenditures for 2027, including Major Projects (projects costing $50 million or greater) is $545.6 million.
[3] Includes 2027 approved and proposed expenditures for Major Projects, including the life extension of Bay d'Espoir Unit 7, life extension of Bay d'Espoir Penstock 3, Avalon Combustion Turbine, and Bay d'Espoir Unit 8. The figure also includes planned supplemental applications for Refurbish Structure – Salmon River Spillway and Major Combustion Turbine Overhaul – Holyrood.

Hydro's Five-Year Capital Plan (2027–2031) is included as Schedule 2 to the Application, providing an overview of Hydro's investment strategy and associated planned capital work for the period 2027–2031, including its Major Projects Capital Plan for the period.

Information in Schedule 2 regarding the projected expenditures by year for Hydro's Major Projects, as well as similar information in Schedule 4 regarding the Bay d'Espoir Hydroelectric Generating Facility, is commercially sensitive information and has been redacted.

An unredacted version of the Application is being provided to the Board on a confidential basis; the parties will be provided with a version in which this information has been redacted. Hydro requests that the Board use the redacted version for posting to its website.

Should you have any questions, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO



Shirley A. Walsh
Senior Legal Counsel, Regulatory
SAW/mc.sk.kd

Encl.

ecc:

Board of Commissioners of Public Utilities
Jacqui H. Glynn
Ryan Oake
Board General

Island Industrial Customer Group
Paul L. Coxworthy, Stewart McKelvey
Denis J. Fleming, Cox & Palmer
Glen G. Seaborn, Poole Althouse

Iron Ore Company of Canada
Gregory A.C. Moores, Stewart McKelvey

Labrador Interconnected Group
Senwung F. Luk, Olthuis Kleer Townshend LLP
Nicholas E. Kennedy, Olthuis Kleer Townshend LLP

Consumer Advocate
Adrienne H.Y. Ding, O'Dea Earle
Justin W. King, O'Dea Earle
Consumer Advocate General

Newfoundland Power Inc.
Dominic J. Foley
Douglas Wright
Regulatory Email

Teck Resources Limited
Darren Hennessey

2027 Capital Budget Application

July 14, 2026

An application to the Board of Commissioners of Public Utilities

newfoundland labrador hydro

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Programs **Program**

Over $5,000,000

- Wood Pole Line Management (2027) 1
- Distribution System In-Service Failures and Miscellaneous Upgrades (2027) 2
- Provide Service Extensions (2027) 3

$1,000,000 to $5,000,000

- Thermal In-Service Failures (2027) 4
- Replace Light-Duty Vehicles (2027–2028) 5
- Renew Diesel Units (2027) 6
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- Replace Light-Duty Mobile Equipment (2027) 15
- Perform Facilities Refurbishments (2027) 16
- Diesel In-Service Failures (2027) 17
- Combustion Turbine In-Service Failures (2027) 18

$750,000 to $1,000,000

- Modify Office Buildings and Procure Furniture, Fixtures, and Equipment (2027) 19
- Upgrade Energy Management System (2027–2028) 20

Volume II

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Projects **Project**

Over $5,000,000

- Refurbish MD-1 (2027–2030) - Ebbegunbaeg 1
- Perform Boiler Condition Assessment and Miscellaneous Upgrades (2027) – Holyrood 2
- Overhaul Turbine Valves – Unit 1 (2027) – Holyrood 3
- Upgrade Line Depot (2027–2029) – Bay d'Espoir 4

$1,000,000 to $5,000,000

- Overhaul Hydraulic Units (2027) 5
- Overhaul Generator – Unit 3 (2027) – Holyrood 6
- Upgrade Worst-Performing Distribution Feeders (2027–2028) 7
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- Replace Diesel Gensets (2027–2029) – Burnt Dam Spillway 19
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$750,000 to $1,000,000

- Migrate Legacy Applications (2027) 27
- Overhaul Main Enclosure (2027) – Stephenville 28
- Overhaul Marine Terminal Loading Arms (2027) – Holyrood 29

Programs and Projects under $750,000

IN THE MATTER OF the *Electrical Power Control Act, 1994*, SNL 1994, Chapter E-5.1 ("*EPCA*") and the *Public Utilities Act*, RSNL 1990, Chapter P-47 ("*Act*"), and regulations thereunder; and

IN THE MATTER OF an application by Newfoundland and Labrador Hydro ("Hydro") for approval of: (i) its capital budget for 2027, pursuant to Section 41(1) of the *Act*, (ii) its proposed capital purchases and construction projects for 2027 in excess of $750,000, pursuant to Section 41(3)(a) of the *Act,* (iii) contributions by certain Customers for contributions towards the cost of improvements to certain property, pursuant to Section 41(5) of the *Act*, and (iv) for an Order, pursuant to Section 78 of the *Act,* fixing and determining its average rate base for 2025.

To: The Board of Commissioners of Public Utilities ("Board")

THE APPLICATION OF HYDRO STATES THAT:

A. Background

1. Hydro is a corporation continued and existing under the *Hydro Corporation Act, 2024*, is a public utility within the meaning of the *Act,* and is subject to the provisions of the *EPCA.*

B. Application

2. The 2027 Capital Budget Application proposes $156.4 million in 2027 expenditures, comprised of expenditures related to single-year programs and projects proposed for completion in 2027 and 2027 expenditures for multi-year programs and projects commencing in 2027, as well as those expenditures in 2027 related to multi-year programs and projects approved in previous capital budget applications.[1] This amount includes $1.8 million in expenditures for which approval to specifically assign the costs to certain customers is requested herein. No new leases with costs in excess of $750,000 over the expected life of the lease are proposed for 2027.

[1] Hydro's 2027 expenditures by single- and multi-year programs and projects are contained within Schedule 1, Appendix B to this application.

3. The 2027 Capital Budget Application request for approval does not include the 2027 expenditures related to supplemental applications approved by or currently before the Board, or those anticipated to be filed with the Board in 2027 as supplemental applications once a full analysis of the proposed project is complete. The request for approval also does not include the 2027 expenditures for Major Project[2] applications approved or currently before the Board, or those anticipated to be filed with the Board at a later date.

4. Schedules 1 to 7 to this application are the 2027 Capital Budget Overview, Five-Year Capital Plan (2027–2031), Holyrood Thermal Generating Station Overview – Future Operation and Capital Expenditure Requirements, Bay d'Espoir Hydroelectric Generating Station – Projected Capital Expenditures (2027–2035), 2026 Capital Expenditures Overview, 2025 Average Rate Base, and Capital Programs and Projects.

5. Schedule 1: The 2027 Capital Budget Overview provides:

   a) An overview of Hydro's capital investment strategy and the capital budget proposed for 2027;

   b) A summary of the revenue requirement impact of Hydro's proposed 2027 Capital Budget Application;

   c) Hydro's 2027 Capital Budget financial schedules with projects listed by investment classification, asset category, materiality, and program and project (Schedule 1, Appendix A), by single- and multi-year programs and projects (Schedule 1, Appendix B), and by materiality: for programs and projects over $5 million (Schedule 1, Appendix C), for programs and projects $1 million to $5 million (Schedule 1, Appendix D), and for programs and projects under $1 million (Schedule 1, Appendix E);[3]

   d) The 2026 Update to the Terminal Station Asset Management Strategy (Schedule 1, Appendix F); and

   e) Hydro's Risk Evaluation Matrix (Schedule 1, Appendix G).

[2] For the purposes of this application, the term 'Major Project' is generally used to describe regulated projects and programs with an anticipated cost of $50 million or greater under the accountability of Hydro's Major Projects department.
[3] A listing of Hydro's planned 2027 projects and programs under $750,000 is contained within Schedule 7 to this application.

6. Schedule 2: Five-Year Capital Plan (2027–2031) provides an overview of Hydro's investment strategy and associated planned capital work for the period 2027–2031, as well as a summary of Hydro's actual and projected capital expenditures for the period 2022–2031 (Schedule 2, Appendix B).

7. Hydro's investment strategy and associated planned capital work for Major Projects are included in Hydro's Five-Year Capital Plan (2027–2031), attached as Schedule 2, and provides an overview of Major Projects capital expenditures for the 2027–2031 period. Proposed expenditures for Major Projects are not included within this application.

8. Schedule 3: Holyrood Thermal Generating Station Overview – Future Operation and Capital Expenditure Requirements provides an overview of future operating and capital requirements for the Holyrood Thermal Generating Station, as well as the ten-year forecast of the system equipment maintenance projects for the Holyrood Thermal Generating Station (Schedule 3, Appendices B and C).

9. Schedule 4: Bay d'Espoir Hydroelectric Generating Station – Projected Capital Expenditures (2027–2035) provides an operational review of the Bay d'Espoir Hydroelectric Generating Station, as well as details of its capital plan for the period 2027–2035.[4]

10. Schedule 5: 2026 Capital Expenditures Overview summarizes 2026 capital expenditures year-to-date May 31, 2026, and provides explanations for reportable variances between the approved budget and the forecasted total budget.

11. Schedule 6: 2025 Average Rate Base sets out Hydro's proposed 2025 rate base of $2,486,782,000.

12. Schedule 7: Capital Programs and Projects contains evidentiary information to support the proposed 2027 construction projects and capital purchases exceeding $750,000, segmented by programs and projects. Also contained in Schedule 7 is a listing of the 2027 proposed programs and projects under $750,000. Capital purchases are included within the programs and projects.

[4] This report is provided in compliance with the direction of the Board in Order No. P.U. 2(2026).

13. There are a number of projects proposed within Hydro's 2027 Capital Budget Application related to assets that serve only one Hydro customer. Hydro's practice regarding assets that serve only one Hydro customer is that the costs of construction and ongoing maintenance of those assets are the responsibility of that customer. Those costs are not borne by other customers through rates or otherwise.

14. The projects, as outlined in Section 6.7 and Table 9 of Schedule 1 to this application, are:

    (i) The replacement of circuit breaker B4L35 as the continuation of Hydro's "Renew Circuit Breakers Program (2026–2027)," and as noted in the "Renew Circuit Breakers Program (2027–2029)" in Schedule 7, Program 12. These assets specifically serve Tacora Resources Inc. ("Tacora"). The total estimated specifically assigned costs for Tacora in 2027 is $680,300; and

    (ii) The replacement of circuit breaker B4L6 and line protection for Wabush Terminal Station Transmission Line L6 as the continuation of Hydro's "Renew Circuit Breakers Program (2026–2027)," and "Replace Protective Relays Program (2026–2027)," and noted in the "Renew Circuit Breakers Program (2027–2029)" and "Replace Protective Relays Program (2027–2028)" in Schedule 7, Programs 12 and 9, respectively. These assets specifically serve the Iron Ore Company of Canada ("IOC"). The total estimated specifically assigned costs for IOC in 2027 is approximately $1.16 million.

15. As noted above, the assets solely serve the indicated customer, and the costs allocated to those assets will be specifically assigned for recovery from each customer.

16. Hydro has provided each respective customer with the cost estimates associated with each project, and each customer has acknowledged its responsibility for its specific costs.

C. Reason for Approval

17. The proposed capital expenditures for 2027 as set out in the 2027 Capital Budget Application are necessary to allow Hydro to continue to provide to its customers service and facilities that are reasonably safe, adequate, and just and reasonable, as required by Section 37 of the *Act*.

D. Newfoundland and Labrador Hydro's Request

18. Hydro requests that the Board make an Order as follows:

a) Approving Hydro's 2027 capital budget of $156.4 million as set out in Appendix A of Schedule 1, pursuant to Section 41(1) of the *Act*;

b) Approving Hydro's 2027 capital purchases and construction projects in excess of $750,000 as set out in the appendices to Schedule 1, pursuant to Section 41(3) of the *Act*;

c) Approving a contribution by those customers noted in paragraph 14 above, of an amount equal to the capital cost of the work described herein related to assets which solely serve the identified customer, pursuant to Section 41(5) of the *Act*; and

d) Fixing and determining Hydro's average rate base for 2025 in the amount of $2,486,782,000 as set out in Schedule 6, pursuant to Section 78 of the *Act*.

E. Communications

19. Communications with respect to this application should be forwarded to Shirley A. Walsh, Senior Legal Counsel, Regulatory for Hydro.

DATED at St. John's in the Province of Newfoundland and Labrador this 14th day of July 2026.

NEWFOUNDLAND AND LABRADOR HYDRO



Shirley A. Walsh
Counsel for the Applicant
Newfoundland and Labrador Hydro,
500 Columbus Drive, P.O. Box 12400
St. John's, NL A1B 4K7
Telephone: (709) 685-4973

Affidavit





IN THE MATTER OF the *Electrical Power Control Act, 1994*, SNL 1994, Chapter E-5.1 ("*EPCA*") and the *Public Utilities Act*, RSNL 1990, Chapter P-47 ("*Act*"), and regulations thereunder; and

IN THE MATTER OF an application by Newfoundland and Labrador Hydro ("Hydro") for approval of: (i) its capital budget for 2027, pursuant to Section 41(1) of the *Act*, (ii) its proposed capital purchases and construction projects for 2027 in excess of $750,000, pursuant to Section 41(3)(a) of the *Act,* (iii) contributions by certain Customers for contributions towards the cost of improvements to certain property, pursuant to Section 41(5) of the *Act*, and (iv) for an Order, pursuant to Section 78 of the *Act,* fixing and determining its average rate base for 2025.

AFFIDAVIT

I, Paul Dillon, of St. John's in the province of Newfoundland and Labrador, make oath and say as follows:

1) I am Director of Engineering, Engineering and Technology, Newfoundland and Labrador Hydro, the applicant named in the attached application.

2) I have read and understand the foregoing application.

3) To the best of my knowledge, information, and belief, all of the matters, facts, and things set out in this application are true.

SWORN at St. John's in the province of Newfoundland and Labrador this 14th day of July 2026, before me:



Barrister, Newfoundland and Labrador
Witnessed through the use of audio-visual technology in accordance with the *Commissioners for Oaths Act* and *Commissioners for Oaths Regulations*



Paul Dillon

Schedule 1

2027 Capital Budget Overview



2027 Capital Budget Application

2027 Capital Budget Overview



Executive Summary

Newfoundland and Labrador Hydro's ("Hydro") 2027 Capital Budget Application ("CBA") requests approval for $156.4 million of capital investment, driven primarily by the need for increased investment in asset renewal and increasing costs associated with a period of sustained high inflation. The 2027 CBA proposed investment equates to approximately 6.0% of the net book value of Hydro's regulated property, plant and equipment and intangible assets.[1]

As Hydro prepares to enter an era of expansion to reliably meet growing electricity demand, it is imperative that Hydro continue to prudently invest in its existing assets to ensure it continues to provide a level of reliability consistent with customer needs and expectations. To that end, Hydro's 2027 capital budget consists largely of investments related to the renewal of existing core assets, which account for over half of Hydro's planned 2027 capital expenditures excluding Major Projects.[2]

In the interest of balancing cost, reliability, and environmental responsibility, Hydro has carefully considered its capital investment portfolio for 2027, and as a result, Hydro has deferred or cancelled 26 projects in preparing its 2027 CBA, which corresponds to an estimated $29.2 million[3] in capital investment in 2027.[4]

Hydro recognizes the impact of increased capital investment on its customers, including those associated with rates and revenue requirements, which are limited as a result of the province's rate mitigation plan. Through to and including 2030, the Government of Newfoundland and Labrador ("Government") has committed to target Island Interconnected System domestic rate increases limited to 2.25% annually. In effect, this means that the capital expenditures required to ensure the delivery of safe, reliable, environmentally responsible power will not create an undue burden on customers.

[1] As of March 31, 2026.
[2] For the purposes of this document, the term 'Major Project' is generally used to describe regulated projects and programs with an anticipated cost of $50 million or greater under the accountability of Hydro's Major Projects department.
[3] This number was derived from Class 5 estimates, and the true amount of deferred investment is likely higher. Note that this total does not include proposals which have been cancelled due to scopes being included under other capital projects.
[4] A list of the programs and projects which were deferred or cancelled for the 2027 CBA is provided in Section 5.1.1.

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Appendix A: 2027 Capital Budget by Investment Classification, Major and Minor Asset Category, Materiality, and Programs and Projects

Appendix B: 2027 Capital Budget by Single- and Multi-Year Programs and Projects

Appendix C: 2027 Capital Budget by Materiality – Programs and Projects over $5 Million

Appendix D: 2027 Capital Budget by Materiality – Programs and Projects $1 Million to $5 Million

Appendix E: 2027 Capital Budget by Materiality – Programs and Projects $750,000 to $1 Million

Appendix F: Terminal Station Asset Management Strategy – 2026 Update

Appendix G: Risk Evaluation Matrix

1.0 Introduction

Hydro's capital investment philosophy is founded on its obligation to invest responsibly in the electrical system to the benefit of its customers. Hydro is committed to investing in capital in a manner that meets its legislated mandate to provide service and facilities that are reasonably safe and adequate, and just and reasonable[5] and to deliver power to consumers at the lowest possible cost, in an environmentally responsible manner, consistent with reliable service.[6]

A key area of strategic focus for Hydro is balancing the management of its aging infrastructure with its mandate. The majority of Hydro's installed assets, including the Bay d'Espoir Hydroelectric Generating Station ("Bay d'Espoir"), the Holyrood Thermal Generating Station ("Holyrood TGS"), the Stephenville Gas Turbine ("GT"), the Hardwoods GT, and much of Hydro's transmission and distribution systems, are more than 40–50 years old. As a result, Hydro's capital investment strategy aims largely to sustain current system-level reliability by undertaking renewal-driven capital investment.

When supported by least-cost and risk evaluation, Hydro's capital investment strategy also proposes targeted service-enhancement investments to address specific issues impacting system-level or localized reliability.

In its aim to balance the provision of reliable service with cost management, Hydro focuses on sound utility asset management practices, condition-based investments (versus age-based investments) where appropriate, and operational and system requirements. Hydro also seeks to engage with stakeholders and customers to inform its capital investment considerations. As part of the ongoing *Reliability and Resource Adequacy Study Review* proceeding, Hydro conducted a digital engagement process where it asked customers to share their thoughts on the costs and reliability of the province's electrical grid. As part of that process, four out of five customers told Hydro they believed the system was reliable, and 87% said they did not want to pay more for reliability improvements that led to fewer or shorter outages.[7] Customers largely prioritize the lowest impact on electricity rates rather than other factors, and Hydro is mindful of this concern as it continues asset management planning.

[5] *Public Utilities Act,* RSNL 1990, c P-47, s 37(1).
[6] *Electrical Power Control Act, 1994*; SNL 1990, c E-5.1, s 3(b)(iii).
[7] "2024 Resource Adequacy Plan – An Update to the Reliability and Resource Adequacy Study," Newfoundland and Labrador Hydro, rev. August 26, 2024 (originally filed July 9, 2024), app. D.

Hydro has applied these practices, particularly in recent years, to work toward reduced investment to the minimum prudent capital level to not compromise customer reliability, safety, or the environment. Hydro also continues to refine its budgeting and integrated planning processes to support the efficient execution of its capital plans.

Hydro's 2027 CBA requests approval for $156.4 million of capital investment, $108.8 million of which consists of newly proposed programs and projects, and $47.6 million related to previously proposed programs and projects, as seen in Figure 1.[8]

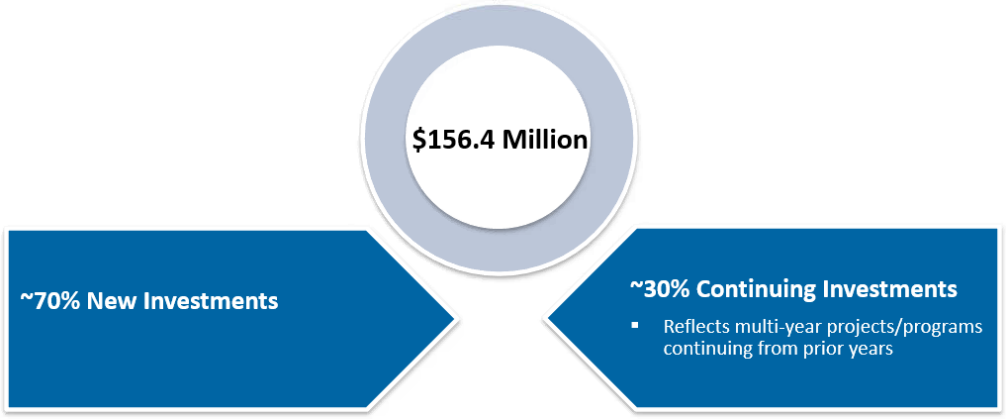


Figure 1: Hydro's 2027 Capital Budget Summary

Increased capital expenditures in recent years primarily reflect ongoing inflation as well as increased renewal-driven expenditures to ensure system reliability, particularly related to aging assets where larger investments are required for major overhaul work, as outlined in Section 6.1. Further detail on Hydro's efforts to manage its 2027 capital spend is included in Section 5.2 of this report.

As outlined in the Five-Year Capital Plan (2027–2031), excluding expenditures related to Major Projects, the total planned 2027 capital spend is $175.3 million, including $1.8 million in specifically assigned customer contributions.[9] The remaining planned capital spend not outlined in this application is associated with supplemental capital expenditures that have been approved,[10] are currently before the

[8] Totals may not add due to rounding.
[9] This does not include contributions associated with service extensions that are determined during the execution of the project in accordance with the Contribution in Aid of Construction ("CIAC") Policy. A breakdown of specifically assigned customer contributions is provided in Section 6.7 of this report.
[10] Hydro reports supplemental capital expenditures under $750,000 which are internally approved within its Quarterly Regulatory Report.

Board of Commissioners of Public Utilities ("Board"), or those which Hydro intends to file in future supplemental applications. In addition, Hydro is anticipating spending approximately $370.3 million on Major Projects in 2027.

A summary of Hydro's anticipated 2027 Capital Expenditures is provided in Table 1.

Table 1: Anticipated 2027 Capital Expenditures[11]

Item	2027 Cost Estimate ($ Millions)
2027 CBA	156.4
Interconnection and Integration of the Puffin Wind Inc. Renewable Energy Project (2025–2027) – Ramea	0.0[12]
Microsoft Enterprise Agreement (2025–2027)	0.4[13]
Additions for Load Growth – Unit 2065 Replacement and Fuel Storage Upgrades (2024–2027) – Rigolet	0.5[14]
Additions for Load Distribution Systems (2024–2027) – Cartwright	0.5
Purchase Spare Generator Step-Up Transformer (2023–2028)	4.3[15]
Fabricate and Install Stoplog Racks (2026–2027) – Bay d'Espoir	0.7
Refurbish Intake 4 (2026–2028) – Bay d'Espoir	3.1[16]
Supply and Install Runner – Unit 2 (2026–2028) – Cat Arm	1.6[17]
TL210 Modification – New Found Gold (2026–2027)	3.9[18]
Battle Harbour Data Solutions Inc. – Non-Firm Service Connection (2026–2027)	0.3[19]
Line Extension and Upgrades for Maritime Resources (2026–2028)	0.0[20]
Upgrade Distribution System – Belleoram Quarry (2026–2027) – English Harbour West	0.7[21]
Interconnection and Integration of the Nain Wind Micro-Grid System	0.2[22]
Additions for Load Growth – Upgrade Terminal Station (2027–2030) – Jean Lake	2.8[23]
Total 2027 Planned Capital Spend Excluding Major Projects	**175.3**
2027 Capital Spend – Major Projects[24,25]	370.3
Total 2027 Capital Spend Including Major Projects	**545.6**

[11] Numbers may not add due to rounding.
[12] As approved in Board Order No. P.U. 9(2025). The 2027 expenditure is approximately $32,000.
[13] As reported in "Report on Amalgamation Activities," Newfoundland and Labrador Hydro, rev. April 17, 2025 (originally filed April 15, 2025).
[14] As approved in Board Order No. P.U. 25(2024).
[15] As approved in Board Order No. P.U. 28(2023).
[16] Supplemental application to be filed in 2026, as approval is required in advance of approval of the 2027 CBA.
[17] As approved in Board Order No. P.U. 8(2026).
[18] "Application for Approval of Line Relocation, and a CIAC for a Portion of the Costs," Newfoundland and Labrador Hydro, June 30, 2026. The application is currently before the Board and includes a CIAC by New Found Gold in the amount of $2.9 million.
[19] As approved in Board Order No. P.U. 6(2026).
[20] As approved in Board Order No. P.U. 19(2026). The 2027 expenditure is approximately $12,600.
[21] As approved in Board Order No. P.U. 4(2026).
[22] Supplemental CIAC application to be filed in 2026, driven by customer request.
[23] Supplemental application to be filed in 2026. Additional information outlined in Section 2.1 of Schedule 5 of this application.
[24] This value represents a portfolio of project estimates generally considered Class 3 Association for the Advancement of Cost Engineering ("AACE") classifications. The "Authorized Cost" for each estimate includes management reserve, contingency, escalation, interest during construction, and the base cost estimate, as applicable.
[25] Includes 2027 approved and proposed expenditures for Major Projects including Avalon Combustion Turbine ("CT"), Bay d'Espoir Unit 8, Life Extension of Bay d'Espoir Unit 7 and the Life Extension Bay d'Espoir Penstock 3. The figure also includes planned supplemental applications for Refurbish Structure – Salmon River Spillway and Major Combustion Turbine Overhaul – Holyrood.

This 2027 Capital Budget Overview report generally discusses the capital plan proposed for 2027, which is primarily driven by the following:

- Renewal required to support the reliable operation of aging assets;
- Extension of the service life of the Holyrood TGS;[26]
- Continuation of programs to address in-service failures and miscellaneous upgrades; and
- Legislative compliance (i.e., safety and environmental).

Appendices A through E of this report present Hydro's 2027 CBA of $156.4 million by asset category, investment classification, single- and multi-year expenditures, and program or project materiality.

1.1 Provisional Capital Budget Guidelines

The Board issued provisional CBA Guidelines ("Guidelines") that outline the evidentiary requirements to be applied, beginning with the 2023 CBA.[27] Table 2 outlines where Hydro has included the required information within the 2027 CBA as part of Hydro's compliance with each section of the Guidelines.

[26] As per "Reliability and Resource Adequacy Study Review – 2022 Update," Newfoundland and Labrador Hydro, October 3, 2022, the Holyrood TGS shall remain available for a "Bridging Period" until 2030, or until such time that sufficient alternative generation is commissioned, adequate performance of the Labrador-Island Link is proven, and generation reserves are met.
[27] "Capital Budget Application Guidelines (Provisional)," Board of Commissioners of Public Utilities, January 2022.

Table 2: Guideline Requirements

Guidelines Section	Content	2027 CBA Location
Application Summary	Activity Drivers per Investment Classification	Schedule 1, Section 6.0
	Determination of Expenditure	Schedule 1, Section 5.0
Reliability Information	Historical SAIDI & SAIFI Statistics: Ten Years	Schedule 1, Section 4.0
	Forecast SAIDI & SAIFI Statistics: Five Years	Schedule 1, Section 4.0
	Benchmarking against Other Utilities	Schedule 1, Section 4.0
	Worst Performing Feeders	Schedule 1, Section 4.0
Rate Impact Summary	Historical Rates	Schedule 1, Section 6.9
	Project Budget Impact	Schedule 1, Section 6.9
Capital Expenditures Summary	Historical Capital: Ten Years	Schedule 1, Section 2.0
	Current Capital Budget	Schedule 1, Section 2.0
	Forecast Capital Budget: Five Years	Schedule 1, Section 2.0
Five-Year Capital Plan	Capital Plan 2027–2031	Schedule 2
Organization	2027 Capital Budget:	
	By Investment Classification, Major and Minor Asset Category, Materiality, and Programs and Projects	Schedule 1, Appendix A
	By Single- and Multi-Year Programs and Projects	Schedule 1, Appendix B
	By Materiality – Programs and Projects over $5 Million	Schedule 1, Appendix C
	By Materiality – Programs and Projects $1 Million to $5 Million	Schedule 1, Appendix D
	By Materiality – Programs and Projects $750,000 to $1 Million	Schedule 1, Appendix E
Required Information	Programs over $750,000	Schedule 7
	Projects over $750,000	Schedule 7
	Programs and Projects under $750,000	Schedule 7
Prioritization	By Risk Mitigated per $1 Million	Schedule 1, Appendix G
	By Risk Mitigated	Schedule 1, Appendix G

1.1.1 Compliance with and Interpretation of Guidelines

Hydro has continued to strive to comply with the evidentiary requirements set out in the Guidelines and has strived to meet the spirit and intent of the Guidelines where full adherence is not yet possible, or not applicable.[28] In most instances, Hydro has fully adhered to the Guidelines. In others, data is presented to the fullest extent practical, along with insight into Hydro's interpretation and application of the Guidelines within its 2027 CBA.

[28] In "Provisional Capital Budget Application Guidelines," December 20, 2021, the Board noted that full implementation of the Guidelines would be challenging in 2022. The Board acknowledged that strict adherence to all aspects of the Guidelines may not be possible but requested that the parties make their best efforts to respect the spirit and intent of the Guidelines. As Hydro has previously stated, full compliance will take years to achieve. In 2026, Hydro has made progress towards full compliance with the Guidelines and will continue to advance amendments to its CBA process to fully satisfy the Guidelines.

Hydro acknowledges that the Board's process is ongoing regarding revisions to the Guidelines based on feedback from the utilities and regulatory stakeholders and welcomes further discussion on this matter before the finalization of the Guidelines in future.

Organization – Programs versus Projects

Consistent with the approach that began in the 2023 CBA, Hydro has again classified the project or program by the primary driver of investment and continues to define programs as only those expenditures that are expected to continue indefinitely.[29] In cases where multi-year expenditures are required to place the asset into service, programs have instead been proposed as multi-year expenditures. Expenditures that span multiple years but will ultimately no longer be required following the completion of an ongoing initiative (e.g., Hydro's previous program to install fire protection in 230 kV stations) have been redefined as projects.[30]

Following the receipt of the 2025 CBA Board Order No. P.U. 28(2024), Hydro conducted a review of the classification of its programs within the 2025 CBA to better conform to the materiality threshold as set out in the Guidelines. In its 2027 CBA, Hydro has defined programs as expenditures that are expected to continue indefinitely but which comprise assets with individual asset values significantly less than the lowest materiality threshold. Hydro continues to evaluate the project or program classification for its expenditures and welcomes further discussion on this matter.

Required Information – Asset Data

Hydro has endeavoured to provide the evidentiary requirements prescribed in the Guidelines to the best of its ability based on the data available; however, for some programs or projects, asset data to meet all requirements, such as the quantification of asset condition and asset remaining life, or historical trending to the level of detail as outlined in the Guidelines, may not be available. Hydro anticipates that asset data will improve with the continuous improvement of Hydro's asset management systems.

[29] Prior to the 2023 CBA, Hydro generally defined programs as those expenditures that span multiple years and address specific requirements for investment, with similar justification and scope year-over-year. Hydro redefined programs in its 2023 CBA to comply with the definition of programs provided in the Guidelines.
[30] Hydro continues to classify some expenditures associated with the Holyrood TGS as programs, despite the planned retirement of the Holyrood TGS by 2030. Hydro believes that the evidentiary requirements for programs are better suited to allow a fulsome review of these expenditures.

Hydro continues to improve its asset management systems, with an emphasis on the implementation of processes to improve and expand on asset and maintenance data. Hydro is continuing to mature its information base, with the goal of establishing a technologically-driven maintenance management system, while setting a solid foundation for potential asset management growth. This effort is an important step toward continued improvement of policy, decision-making processes, training and standardization across all areas of asset management, and was reviewed during the *Asset Management Assessment of Newfoundland and Labrador Hydro* completed by the Board's external consultant, EA Technology Ltd. in 2026.[31]

In 2026, Hydro is continuing to progress the review and optimization of its Computerized Maintenance Management System for hydraulic generating assets. Current efforts are focused on the preventive maintenance review for hydraulic assets on the island, strengthening the connection between maintenance activities, asset condition, equipment health monitoring, and long-term capital investment planning.

As part of Hydro's broader Asset Management objectives, an updated Asset Management Policy has been developed and is currently under executive review. In addition, enhancements to the distribution outage database have been completed. This enables a more detailed analysis of customer-impact outage events and helps support improved reliability reporting and decision-making. These initiatives are helping to strengthen Hydro's asset management practices, improve data quality, and establish a foundation for future improvements across Hydro's operational areas. Hydro has also developed document control standards for Major Projects, with the intent of rolling out the standards organizationally over time.

While a common asset management system for both regulated and non-regulated assets can take up to a decade to implement, Hydro is utilizing information learned to further bolster its capital planning efforts. Hydro is committed to continuous improvement in this area and recognizes the value that improved asset management systems and data will add in enabling a fulsome review of Hydro's capital investments by its stakeholders; Hydro believes that the evidence provided in support of this application fully supports the proposed investments.

[31] "Asset Management Assessment of Newfoundland and Labrador Hydro To Parties – Engagement of EA Technology Ltd.," Board of Commissioners of Public Utilities, May 23, 2025.

Prioritization

Hydro recognizes the Board's request that projects and programs be prioritized based on risk mitigated per dollar spent, as well as by reliability improvement per dollar spent. In some cases, risk mitigated per dollar spent can be an effective tool for consideration when prioritizing scopes of a similar materiality and purpose within a single program. However, as previously communicated, Hydro believes that generally, prioritization by risk mitigated per dollar spent may not be an effective comprehensive risk indicator for prioritization of projects. Nonetheless, Hydro has provided this metric herein in compliance with the Guidelines currently in effect. As Hydro continues to develop its asset management systems, Hydro will assess opportunities to collect and analyze data to facilitate the prioritization of projects and programs by reliability improvement.

Hydro has also proposed to the Board the addition of 'Economics' to the categories in which projects and programs are evaluated for risk mitigation. Hydro believes this will enable a fulsome evaluation of service enhancement-driven expenditures that may be motivated by cost savings for customers.[32]

2.0 Capital Expenditures Summary

Hydro determined its proposed 2027 capital expenditures in accordance with its capital investment strategy, as shown in Figure 2. Hydro considers many factors in the selection of the projects and programs for inclusion in its budget, including operational risks, ability to execute, total investment, and cumulative risk associated with balancing aging assets while providing least-cost, reliable service in an environmentally responsible manner. The focus of the 2027 CBA is to maintain the expected level of reliability while ensuring prudent and reasonable expenditures reflective of Hydro's capital plan considerations, which represent an achievable level of execution success.

[32] "Capital Budget Application Guidelines Review – Request for Comments/Input Regarding Draft Changes – Hydro's Comments," Newfoundland and Labrador Hydro, May 5, 2023.



Figure 2: Hydro's Capital Investment Strategy

Chart 1 demonstrates the trend in capital expenditures, including capital expenditures for Major Projects, from 2016 to 2031 against Hydro's historical average.[33] To date, Hydro has largely been focused on the refurbishment of its aging assets to ensure customers continued to receive reliable electricity service at least-cost for the useful life of an asset; however, many assets are approaching retirement and will require replacement. As Hydro undertakes Major Projects to enable the system expansion required to reliably meet growing demand, replace retiring sources of generation and perform major life extension work on its existing assets, there is a significant increase in average annual capital expenditures from historical levels. Hydro's average capital expenditure from 2016 through 2025 was approximately $166.4 million annually, which was driven primarily by expenditures on asset renewal; from 2026 to 2031 the anticipated average expenditure increases to approximately $530.1 million annually. Accordingly, Hydro's primary investment driver also changes from asset renewal to system growth. Hydro recognizes that these expenditures are significant, and feedback from customers has been very clear. The cost of living, including electricity rates, is a concern. Hydro is diligently reviewing its proposed capital expenditures and is continuing to recommend only the work scopes that absolutely and urgently must be completed to support reliability and begin to prepare for load growth.

[33] 2026 Capital Expenditures include carryover from 2025.

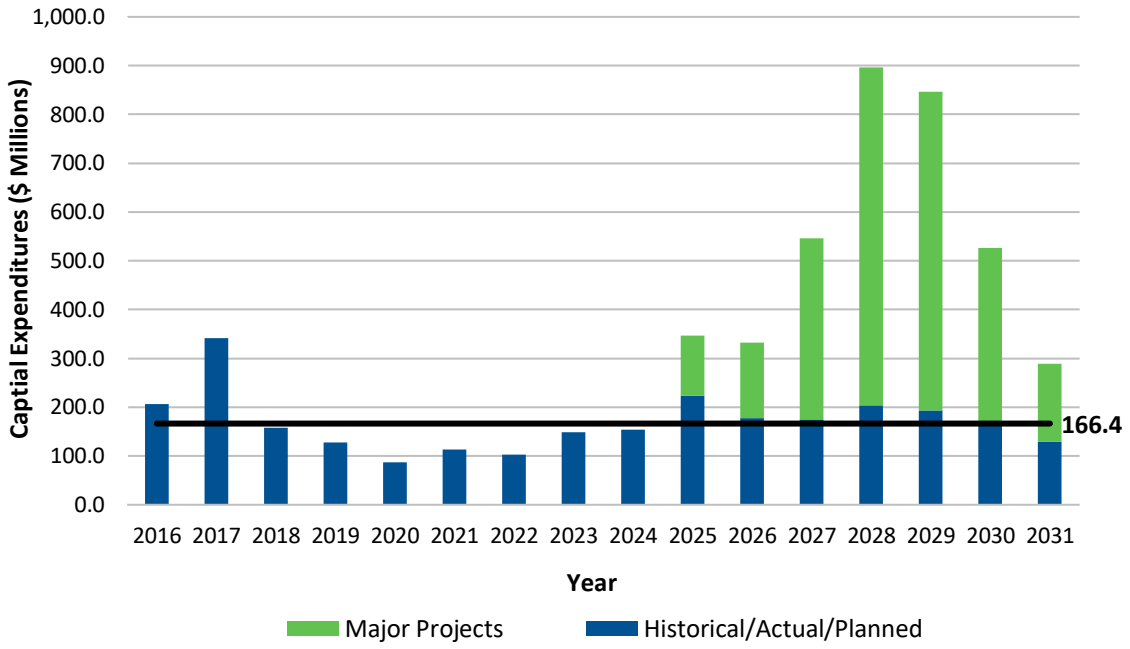


Chart 1: Historical, Actual and Forecasted Capital Expenditures including Major Projects[34]

As shown in Chart 1, Hydro's anticipated expenditures are forecast to be considerably higher for the period 2027–2031, primarily as a result of the Major Projects proposed in Hydro's 2025 Build Application[35] and other planned Major Projects to invest in asset renewal. This schedule excludes detailed information related to any Major Projects which are currently ongoing and/or within the 2027–2031 capital plan. At this time, Hydro's five-year capital plan also excludes any future application by Hydro for the long-term supply for southern Labrador, as Hydro is currently reviewing, studying, and implementing ways to ensure that Charlottetown, Pinsent's Arm, and the other communities in the region receive safe, reliable service now and long-term. This work is underway and intended to inform a future application for long-term supply in Charlottetown and Pinsent's Arm.[36]

[34] The values included for Major Projects represent a portfolio of project estimates generally considered Class 3 AACE classifications. The "Authorized Cost" for each estimate includes management reserve, contingency, escalation, interest during construction and the base cost estimate, as applicable.
[35] "2025 Build Application – Bay d'Espoir Unit 8 and Avalon Combustion Turbine," Newfoundland and Labrador Hydro, March 21, 2025.
[36] For further information, please refer to "Newfoundland and Labrador Hydro's 2021 Capital Budget Supplemental Application for Approval of the Construction of Hydro's Long-Term Supply Plan for Southern Labrador – Update," Newfoundland and Labrador Hydro, June 25, 2025.

In the 2024 Resource Adequacy Plan,[37] Hydro recommended the Minimum Investment Expansion Plan that meets reliability requirements while balancing cost and environmental considerations. The preferred, least-cost, environmentally responsible resource options under this recommendation are a CT with renewable fuel capabilities on the Avalon Peninsula ("Avalon CT"), and Bay d'Espoir Unit 8. Hydro subsequently applied for these projects in the 2025 Build Application, which is currently under review before the Board.[38] In addition to the Avalon CT and Bay d'Espoir Unit 8 projects, which are driven by system growth, Hydro is also currently undertaking or planning to undertake several renewal projects to extend the life of assets in Bay d'Espoir, including: Unit 7 Life Extension,[39] and the planned life extensions of Penstock 2 and Penstock 3.[40]

These Major Projects account for approximately $2.2 billion of Hydro's planned capital expenditures for the period 2027–2031.[41] Further discussion of Hydro's planned capital expenditures for the period 2027–2031 is provided in Schedule 2 of this application.

3.0 2026 Capital Plan Execution

Hydro's approved capital projects and programs continue to advance through stages of planning, design, procurement, and construction in 2026. Typically, most of Hydro's planned capital construction activities occur in the second, third, and fourth quarters of each year. Additionally, throughout the year, certain unplanned capital work, known as "break-in work," may arise and need to be addressed, which could affect the amount of planned work that can be completed.

With a large and complex capital program, some degree of carryover is to be expected and is managed through established project management practices that incorporate continual improvement methodologies. This carryover can be strategic, such as deferring projects due to changes in timing requirements, or due to external factors like supply chain disruptions or internal challenges in

[37] "2024 Resource Adequacy Plan – An Update to the Reliability and Resource Adequacy Study," Newfoundland and Labrador Hydro, rev. August 26, 2024 (originally filed July 9, 2024).
[38] In Board Order No. P.U. 17(2025), the Board approved Hydro's application to proceed with $47.4 million of early execution work for the Avalon CT and Bay d'Espoir Unit 8 projects. In Board Order No. P.U. 7(2026), the Board approved $29.3 million of additional early execution work for the Avalon CT. In Board Order No. P.U. 21(2026), the Board approved $5.6 million of additional early execution work for Bay d'Espoir Unit 8. Board approval of the Additional Early Execution Application will mitigate risks associated with supply chain delays and market pressures to allow for project continuity, while the Board and parties consider the 2025 Build Application.
[39] As approved in Board Order No. P.U. 12(2026).
[40] As approved in Board Order No. P.U. 22(2026).
[41] Please refer to Schedule 2 of this application for a discussion of Hydro's five-year plan, including Major Projects.

scheduling resources. Hydro assesses the risk of one-year delays during annual planning and uses project change management to mitigate impacts.

Hydro is closely monitoring the execution of its 2026 capital plan and will continue to prioritize work to maximize system reliability in advance of the 2026–2027 winter operating season. Any projects or programs with identified carryover will be reflected in Hydro's 2026 Capital Expenditures and Carryover Report.[42]

Schedule 5 of this application contains the 2026 Capital Expenditures Overview report as of May 31, 2026, which details forecast expenditures and variances. As required by the Guidelines, explanations will be provided for projects and programs with variances exceeding 10% and $100,000 at year-end, as part of Hydro's Capital Expenditures and Carryover Report.

4.0 Reliability

Hydro is classified as a Region 2 (Urban/Rural) utility by Electricity Canada ("EC"). For benchmarking against similar utilities, Hydro has provided EC Region 2 SAIDI[43] and SAIFI[44] averages.[45]

4.1 Utility Reliability

Reliability of service is integral to Hydro's mandate, with the majority of expenditures being partially related to maintaining or improving reliability. As such, the End Consumer Performance Index was developed to measure the reliability of service to all end consumers of electricity in the province that are supplied by Hydro, other than Hydro's Industrial customers. The measure is a combination of Hydro's Service Continuity data and Newfoundland Power Inc.'s ("Newfoundland Power") Service Continuity data for outages related to loss of supply due to events on Hydro's transmission system. Therefore, the SAIDI and SAIFI data provided for End Consumers are measures of the duration and

[42] To be filed with the Board on or before April 1, 2027.
[43] System Average Interruption Duration Index ("SAIDI") is a reliability key performance indicator for distribution service, measuring service continuity in terms of the average cumulative duration of outages per customer served during the year.
[44] System Average Interruption Frequency Index ("SAIFI") is a reliability key performance indicator for distribution service, measuring the average cumulative number of sustained interruptions per customer per year.
[45] EC Region 2 averages are not available prior to 2015.

frequency of service interruptions experienced as a result of Hydro system events. Hydro does not track End Consumer metrics for the Island and Labrador separately.[46]

Service Continuity measures the reliability of service to consumers supplied directly by Hydro-owned distribution. Whereas EC Region 2 consists of utilities with a mix of rural and urban customers, Hydro's distribution customers are widely dispersed geographically, being primarily located in rural and/or remote areas; for this reason, Hydro's reliability metrics for Service Continuity are comparatively higher than the EC Region 2 average. This is consistent with Hydro's efforts to balance reliability and cost. Hydro notes that its historical reliability trends have been relatively flat over the period studied. This is reflective of Hydro's overall capital investment strategy, as renewal-driven capital investment makes up approximately 58% of Hydro's proposed 2027 Capital Budget, excluding Major Projects.

Hydro establishes End Consumer and Service Continuity SAIDI and SAIFI targets each year through the development of a five-year average.

4.1.1 Hydro System

Chart 2 and Chart 3 provide Hydro's End Consumer and Service Continuity SAIFI with and without major events included compared to the EC Region 2 average.

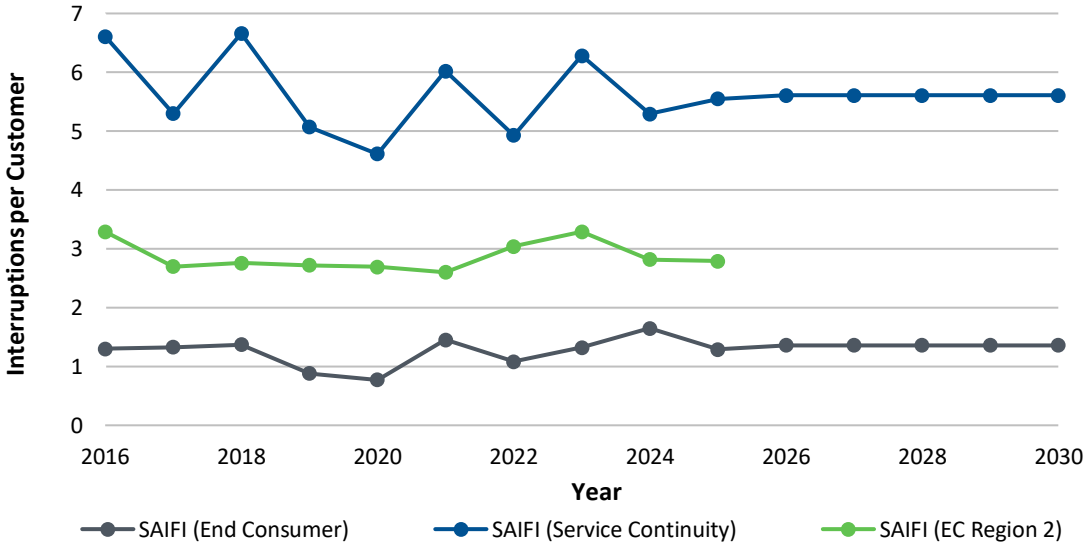


Chart 2: SAIFI Excluding Major Events

[46] As Hydro is the only utility serving Labrador, Hydro's Service Continuity metrics are equivalent to its End Consumer metrics in this region.

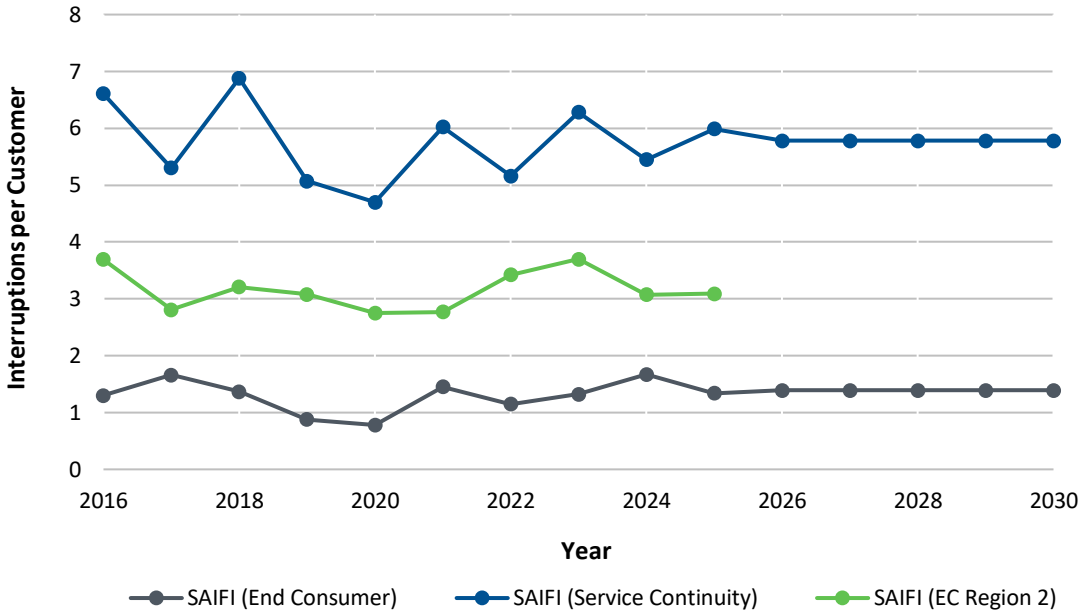


Chart 3: SAIFI Including Major Events

Chart 4 and Chart 5 provide Hydro's End Consumer and Service Continuity SAIDI with and without major events included compared to the EC Region 2 average.

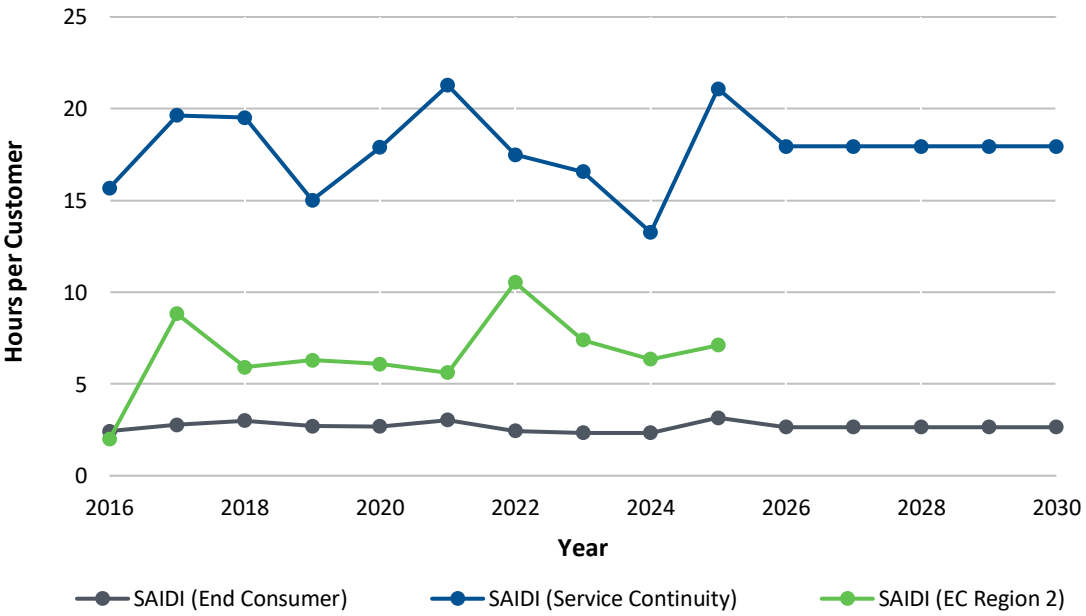


Chart 4: SAIDI Excluding Major Events

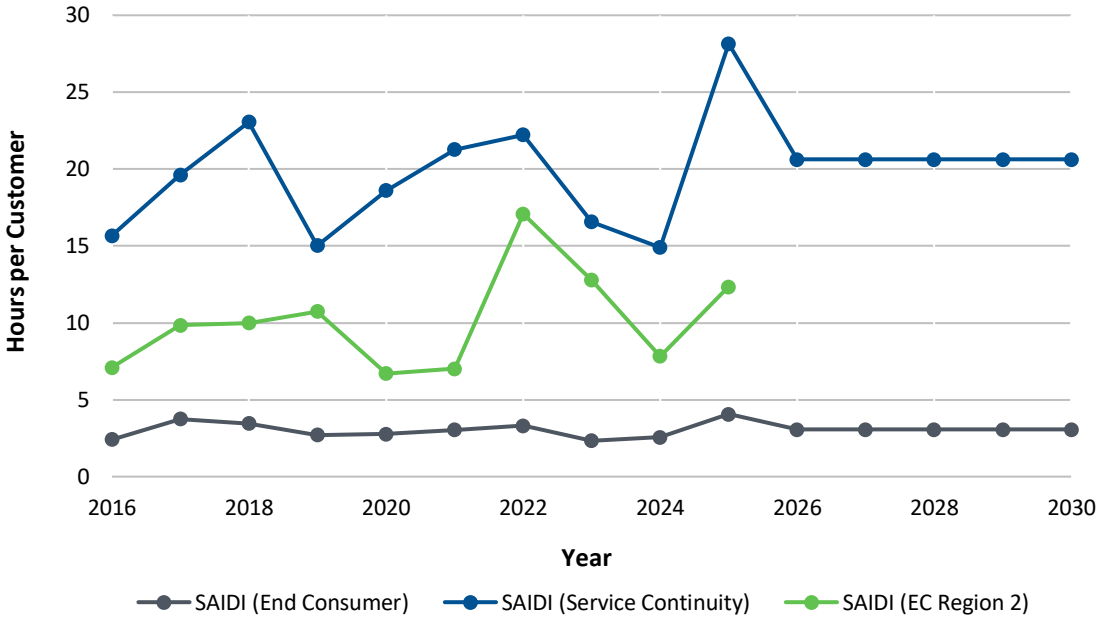


Chart 5: SAIDI Including Major Events

4.1.2 Island

Chart 6 and Chart 7 provide Hydro's Service Continuity SAIFI with and without major events included compared to the EC Region 2 average, for the Island portion of the province.

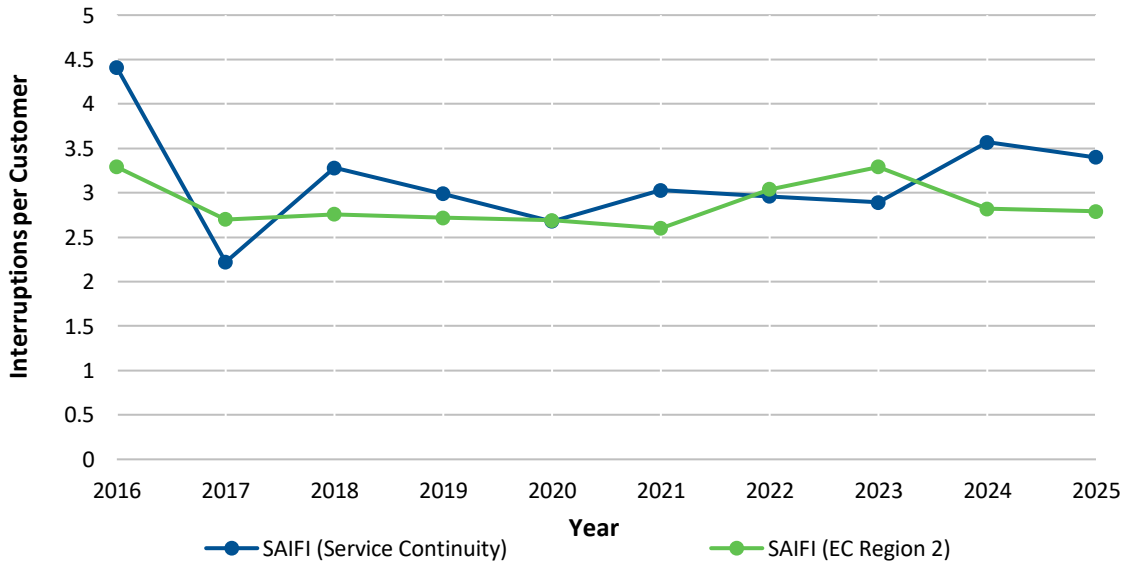


Chart 6: SAIFI Excluding Major Events – Island

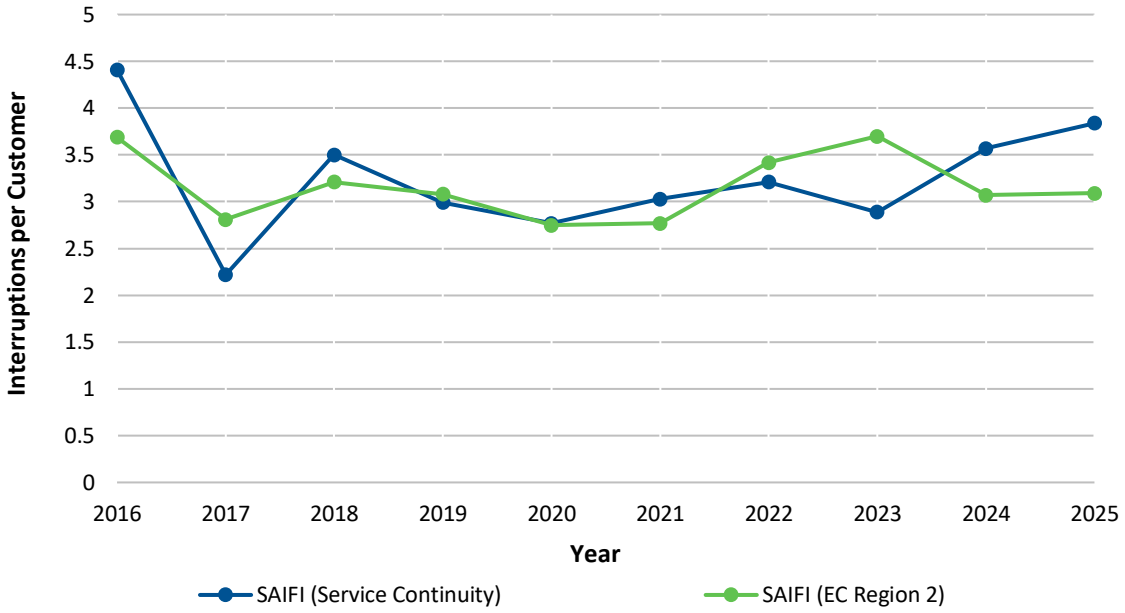


Chart 7: SAIFI Including Major Events – Island

Chart 8 and Chart 9 provide Hydro's Service Continuity SAIDI with and without major events included compared to the EC Region 2 average, for the Island portion of the province.

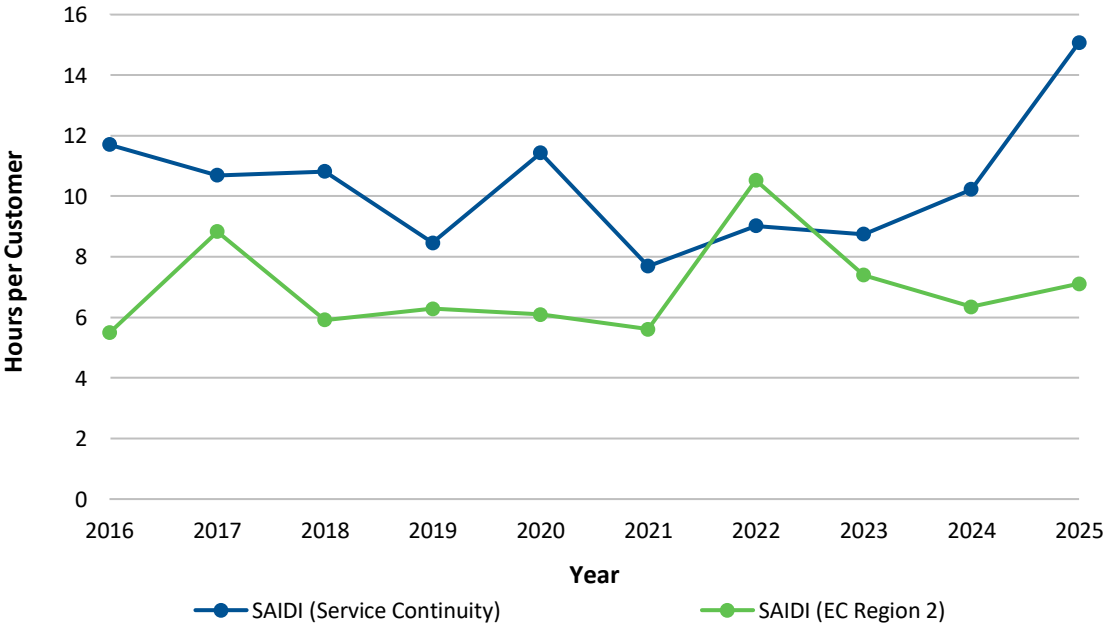


Chart 8: SAIDI Excluding Major Events – Island

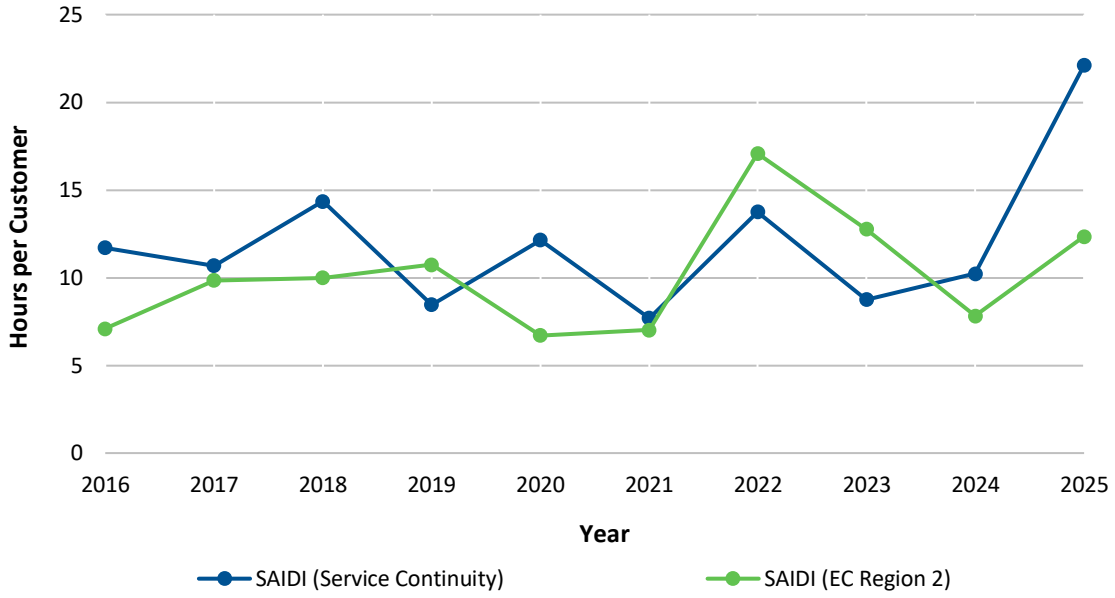


Chart 9: SAIDI Including Major Events – Island

4.1.3 Labrador

Chart 10 and Chart 11 provide Hydro's Service Continuity SAIFI with and without major events included compared to the EC Region 2 average, for Labrador.

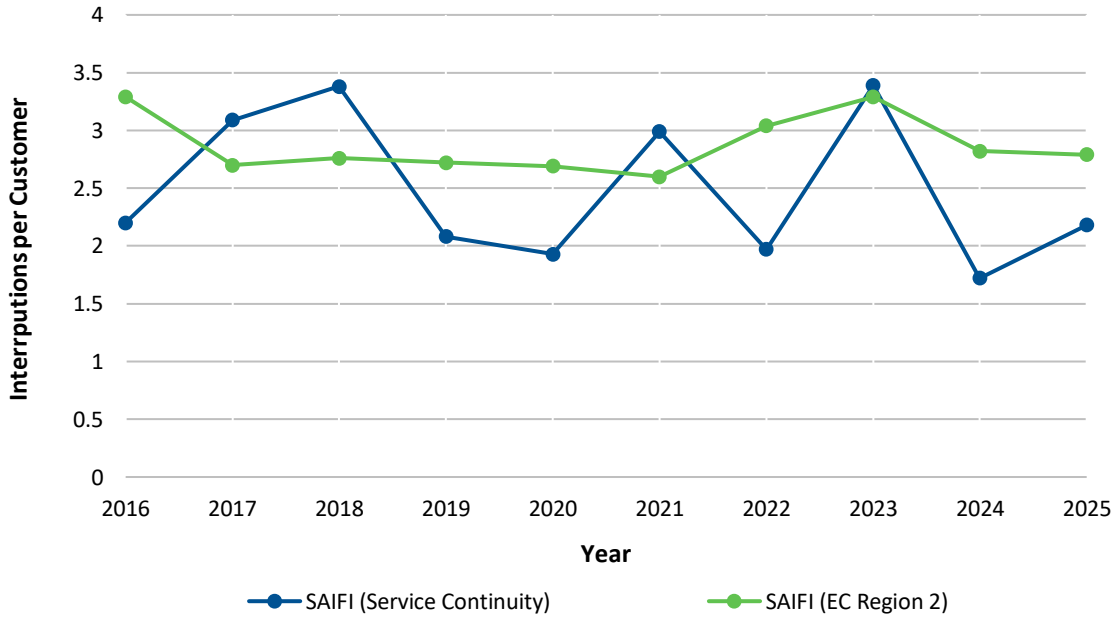


Chart 10: SAIFI Excluding Major Events – Labrador

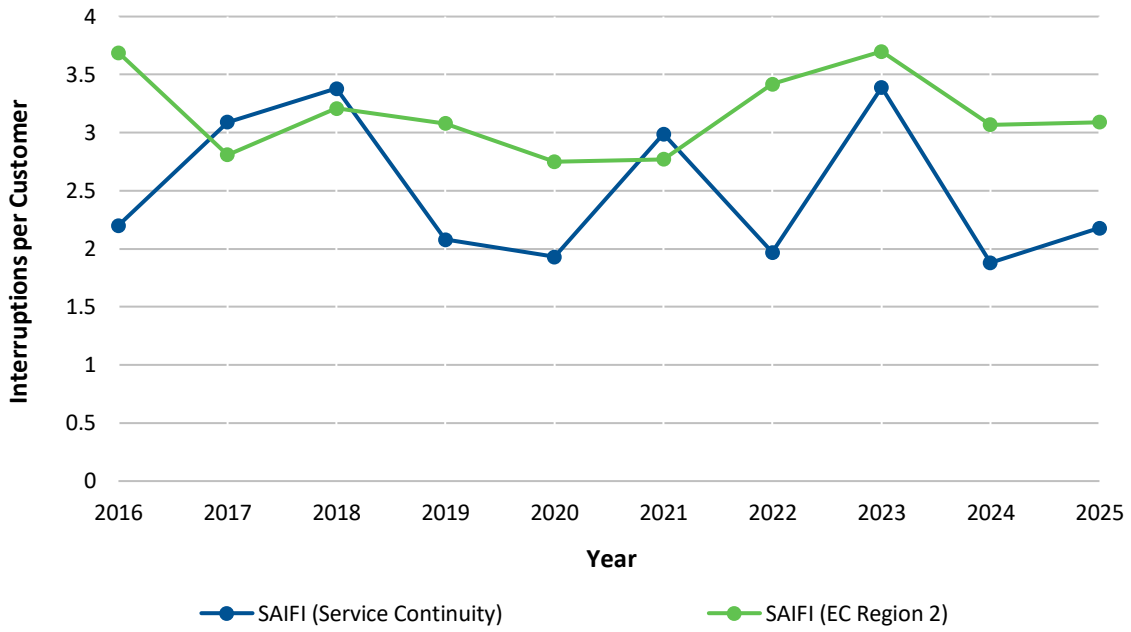


Chart 11: SAIFI Including Major Events – Labrador

1 Chart 12 and Chart 13 provide Hydro's Service Continuity SAIDI with and without major events
2 compared to the EC Region 2 average, for Labrador.

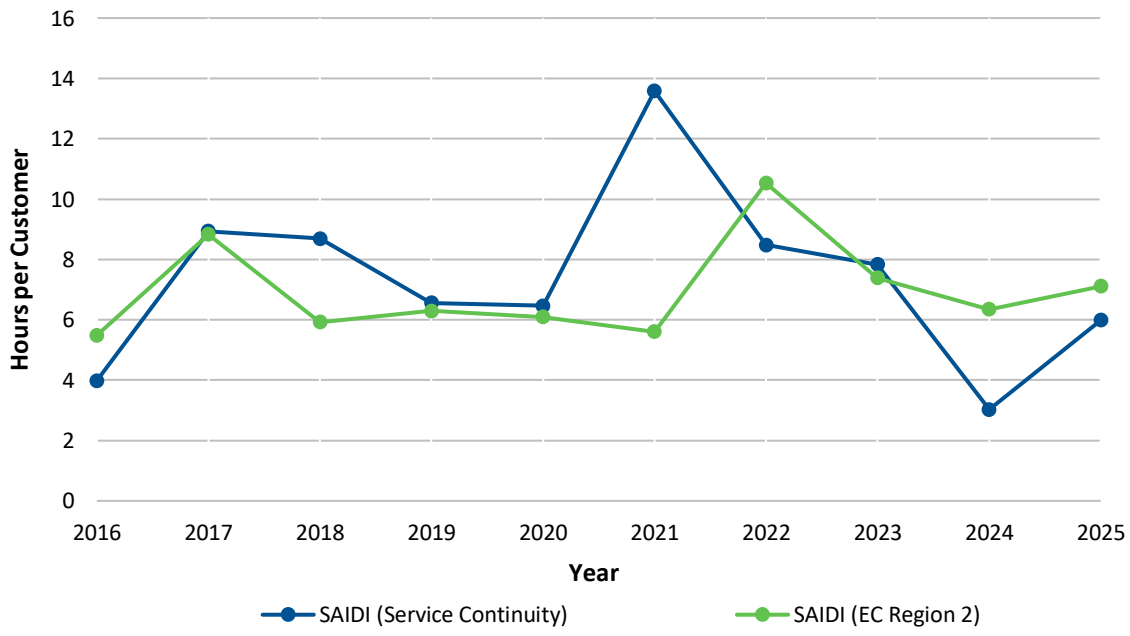


Chart 12: SAIDI Excluding Major Events – Labrador

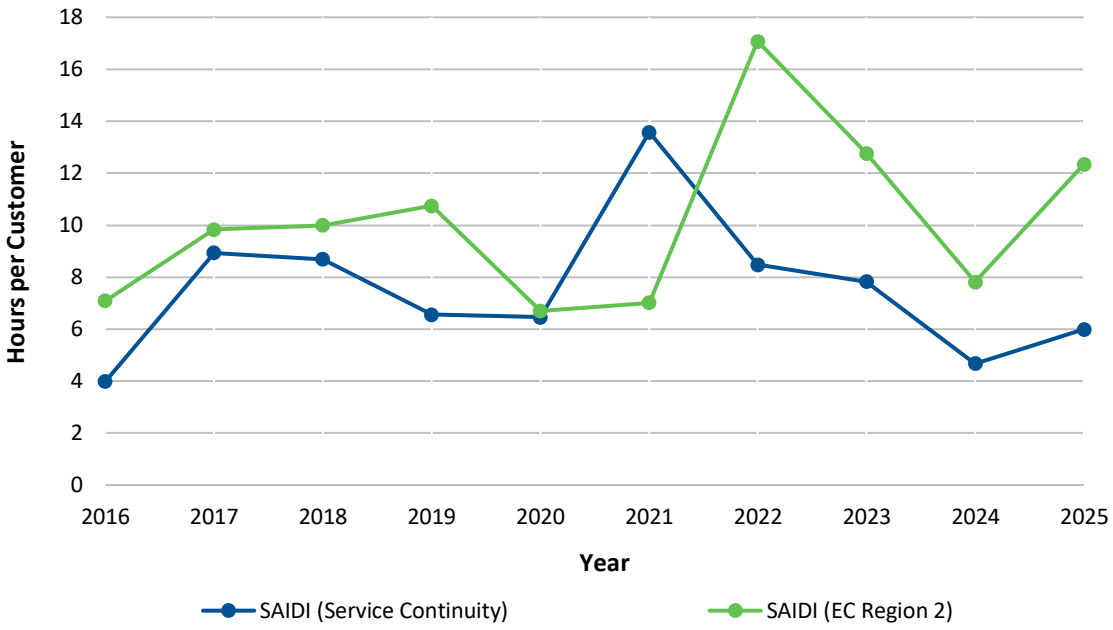


Chart 13: SAIDI Including Major Events – Labrador

4.2 Worst Performing Feeders

Hydro tracks its worst-performing feeders by SAIDI, SAIFI, and CHI[47] independently. Table 3, Table 4, and Table 5 present data related to Hydro's worst-performing feeders for each of these metrics, respectively, along with Hydro's average feeder SAIDI, SAIFI, and CHI, exclusive of contributions upstream from distribution feeders. When considering service enhancement projects to address worst-performing feeders, Hydro prioritizes feeders based on five-year average reliability indices. These metrics are used independently of each other and are intended to identify trending reliability issues. Hydro then uses condition assessment information to validate the issues identified through the indices to finalize the scope of work required to effectively upgrade the system. Finally, the criticality of the system is reviewed with respect to the number of dependent systems that rely on the reliability of the infrastructure in question.

In the 2027 CBA, Hydro is proposing a project to improve the reliability performance of Fleur de Lys Line 1 ("FDL-L1"), based on the feeder's SAIDI, SAIFI, and CHI performance, as well as its condition. Hydro notes that there are other feeders shown on the SAIDI, SAIFI, and CHI lists that are higher or close in

[47] Customer Hours of Interruption ("CHI"). Hydro's Average CHI represents the average number of CHI per feeder. It is calculated by dividing the number of total customer outage hours by the number of distribution feeders.

priority to the ranking for FDL-L1. These feeders have been excluded from the selection process for 2027 capital work as they either have capital projects planned, issues which are being corrected under other programs, or field inspections did not indicate a root cause and additional investigation is ongoing. Please refer to the project proposal included in Schedule 7 for more detailed information.

Table 3: Worst Performing Feeders Sorted by SAIDI (Five-Year Average)

Rank	Feeder	SAIDI
1	Jackson's Arm, Line 2	27.54
2	Black Tickle, Line 1	18.74
3	South Brook, Line 1	17.80
4	South Brook, Line 2	16.70
5	Fleur de Lys, Line 1	16.41
6	English Harbour, Line 1	16.36
7	Grandy Brook, Line 5	15.79
8	Farewell Head, Line 1	15.78
9	Hampden, Line 1	14.77
10	South Brook, Line 7	12.51
	Hydro Average	3.84

Table 4: Worst Performing Feeders Sorted by SAIFI (Five-Year Average)

Rank	Feeder	SAIFI
1	English Harbour, Line 1	3.69
2	Happy Valley, Line 7	3.60
3	Bottom Waters, Line 3	3.56
4	South Brook, Line 1	3.11
5	Jackson's Arm, Line 2	3.07
6	L'Anse-Au-Loup, Line 1	2.95
7	Fleur de Lys, Line 1	2.84
8	St. Anthony, Line 1	2.78
9	Hampden, Line 1	2.78
10	Black Tickle, Line 1	2.65
	Hydro Average	1.55

Table 5: Worst Performing Feeders Sorted by CHI (Five-Year Average)

Rank	Feeder	CHI
1	South Brook, Line 1	16,075
2	English Harbour, Line 1	13,095
3	Happy Valley, Line 7	8,644
4	Jackson's Arm, Line 2	8,087
5	Barachoix, Line 4	6,695
6	Barachoix, Line 1	5,553
7	South Brook, Line 5	5,228
8	St. Anthony, Line 1	4,863
9	Bottom Waters, Line 1	4,330
10	Kings Point, Line 1	4,295
	Hydro Average	1,121

5.0 2027 Plan Considerations

5.1 Program and Project Evaluation

5.1.1 Proposal Deferral, Cancellation, Additions, and Advancement

Prior to proposing capital programs and projects for inclusion in the CBA, Hydro considers whether the investment can be deferred in light of the condition of the asset and its criticality to the system. Where deferral of a program or project is determined to be low risk, that option is selected in an effort to balance the cost impact to customers with the level of reliability required.

A number of the capital projects proposed are required to address safety concerns or to comply with regulatory and legislative requirements; therefore, deferral is not appropriate. For example, Hydro is required under legislation to provide reliable and accurate revenue metering to its customers and maintain compliance with the Government of Canada's *Electricity and Gas Inspection Act and Regulations*. To defer such projects to future years would place Hydro behind schedule and at risk of not meeting legislative requirements. Additionally, deferral is not appropriate for projects that are required due to system growth, as it would compromise Hydro's ability to meet its peak load requirements and ensure reliable service.

As part of its assessment of alternatives, and as required by the Guidelines, Hydro considered deferral for each program or project contained in the 2027 CBA. The specific proposals detail the reason(s) for deferral not being the preferred option.

A list of deferred proposals that were originally planned to commence in 2027 is provided in Table 6.[48] The reasons for deferral of these proposals vary and may include additional analysis required to assess alternatives, consideration of resource and outage availability, and assessment of risk associated with deferral.

Table 6: Deferred 2027 Capital Proposals

Deferred Proposal	2027 Deferred Cost ($000)
Install Plant Heating System (2027–2029) – Holyrood	4,887.3
Refurbish Stage II Cooling Water Sumps (2027) – Holyrood	4,719.0
Overhaul Unit 6 (2027) – Bay d'Espoir	3,397.9
Refurbish Spherical Valves – Units 1–6 (2027–2032) – Bay d'Espoir	1,500.0
Replace Diesel Shop Building (2027–2028) – Bishop's Falls	1,422.0
Replace Controllers (2027–2030) – Granite Canal	1,250.0
Additions for Load Growth - Upgrade Line 7 (2027–TBD) – Happy Valley	793.6
Major Refurbishment Turbine & Generator (2027–2029) – Upper Salmon	500.0
Resurface Parking Lots and Roads (2027–2028) – Bishop's Falls	500.0
Upgrade Online Monitoring - Unit 3 (2027) – Holyrood	500.0
Performance Management (2027–2028)	250.0
Install Secondary Station Service Supply (2027–2029) – Holyrood	150.0
Utility Replacement (2027–2030)	150.0
Replace Switchgear (2027–2029) – Grand Falls Terminal Station	130.0
Replace AC Fuel Pumps (2027–2028) – Hardwoods	100.0
Implement Recruitment System (2027–2028)	100.0
Replace Powerhouse Roofs (2027–2028) – Hinds Lake	84.3
Replace Vibration System (2027–2028) – Stephenville	50.0
Total Deferred 2027 Capital Proposals	**20,484.1**

Occasionally, Hydro cancels projects that had previously been identified in Hydro's capital plans. Reasons for cancellation vary but may include proposals that are no longer required due to changes in system operations, scopes merged with other capital projects, or projects for which non-capital alternatives have been identified. Hydro will also occasionally cancel a project, or a portion of a project, following Board approval if the justification, scope, or cost of a project has changed materially and is no longer required or requires additional consideration before re-proposing.

[48] Hydro currently tracks proposal deferrals but does not track the deferral of individual scope elements within programs or projects.

A list of projects and programs originally planned for 2027 that have been cancelled is provided in Table 7.

Table 7: Cancelled 2027 Capital Proposals

Cancelled Proposal	2027 Cancelled Cost ($000)
Refurbish Stage I Cooling Water Sumps (2027) – Holyrood	4,719.0
Refurbish Windows (2027–2030) – Hydro Place	1,279.3
Additions for Load Growth (2027) – Isolated Generation Stations	945.3
Overhaul Unit 2 and Unit 3 Boiler Stop Valves (2027) – Holyrood	800.0
Perform Level 2 Condition Assessment – Light Oil System (2027) – Holyrood	400.0
Replace Air Compressor 1 (2027–2028) – Holyrood	363.4
Rollout Document Control System (2027)	200.0
Rollout HP Content Manager (2027)	50.0
Total Cancelled 2027 Capital Proposals	**8,757.0**

Hydro occasionally includes projects or programs in its capital budget that had previously been identified in a future year. Reasons for advancement may include urgency due to faster-than-anticipated condition deterioration, or optimization of outage schedules and resources. For 2027, Hydro has advanced Perform Major Inspection – Synchronous Condenser 2 (2028–2029) – Wabush Terminal Station. These major inspections are completed on a three-year cycle, and due to the advancement of the 2026 inspection to 2025, this move was required to realign the three-year interval.[49]

Hydro aims to capture its planned expenditures in its five-year capital plan submitted annually with its CBA; however, projects or programs not previously identified may be included as a result of changing system conditions and newly identified requirements driven by system growth or assessment of existing assets. A list of projects and programs advanced or added to 2027 is provided in Table 8.

[49] The last Synchronous Condenser 2 level II condition assessment was originally planned for completion in 2026 but was advanced to 2025 due to a failed rotor pole requiring the rotor to be pulled, requiring the majority of the level II condition assessment to be performed.

Table 8: 2027 Capital Proposal Additions

Added Proposal	2027 Additional Cost ($000)
Stabilize Powerhouse Slope (2027) – Cat Arm	1,729.80
Overhaul Main Enclosure (2027) – Stephenville	975.4
Refurbish MD-1 (2027–2030) – Ebbegunbaeg	665.8
Procurement of LiDAR for Digitization of Transmission Lines (2027)	500
Replace Exciter Controller - SC1 and SC2 (2027–2028) – Wabush	467.3
Additions for Load Growth - Upgrade Fuel Storage (2027) – Cartwright	442.7
Install Fire Protection in 230 kV Stations (2027–2028) – Bottom Brook	73.8
Perform Major Inspection -Synchronous Condenser 2 (2027–2028) – Wabush Terminal Station	63.6
Total 2027 Capital Proposal Additions	**4,918.4**

5.1.2 Capital Proposals

Maintaining Hydro's systems in a reliable operating condition requires planned maintenance, rehabilitation of existing assets, and replacement of assets that have reached the end of their useful lives. Replacement of assets may also occur to reduce life-cycle costs, improve operational characteristics, increase capacity for load growth, address violations of reliability criteria, improve productivity, and/or increase efficiency.

In determining whether a capital proposal is appropriate, Hydro gives consideration to:

- Safety, environmental, or reliability risk and degree of expected mitigation;
- System performance and reliability metrics;
- Hydro's long-term asset management strategy;
- Regulatory and legislative compliance;
- Load growth and system planning criteria;
- Hydro's experience with the assets, including the condition and performance of the assets;
- Ongoing operating and maintenance costs;
- Opportunities for cost efficiencies; and
- Changes to operating conditions.

For those proposals that relate to the replacement of assets, Hydro bases such decisions on three broad categories of replacement criteria, as follows:

1) Time and Condition-Based: hours of operation and condition, for example, diesel gensets (100,000 hours of operation for 1,800 rpm units) and vehicles (combination of years and kilometres for some classes);

2) Condition-Based: in-situ condition of the assets, for example, decay in transmission line wood poles; and

3) Technical Assessment-Based: an evaluation of reliability, performance, condition, costs, and other factors, such as the inspection of fuel tanks and subsequent upgrade, where required.

5.2 Reassessment of Planned Capital Expenditures

Beginning in 2021 with its filing of the 2022 CBA, Hydro began undertaking a thorough review of its previously approved multi-year projects to identify opportunities for budget refinement for ongoing projects or programs.[50] Hydro has continued this exercise in preparing its 2027 CBA. Hydro has planned and identified projects to balance capital expenditures with customer reliability, safety, and the environment. The 2027 CBA reflects the significant investments required to meet Hydro's mandate of providing safe, reliable service. Hydro continues to focus on effective cost management and identifying opportunities to minimize impacts to customers. In the interest of balancing cost and reliability, Hydro has focused on execution planning and operational efficiencies. Hydro has deferred or cancelled 26 projects, resulting in an over $29.2 million reduction in the overall capital budget in 2027.[51]

5.3 Estimate Accuracy

Estimates for Hydro's capital projects and programs are developed primarily by Hydro's engineering staff, with support from engineering consultants as required. In developing estimates for capital expenditures, Hydro completes front-end engineering design to define project scope and identify project constraints, and utilizes historical project expenditures and experience, and vendor and contractor quotes, to develop project costing.

[50] Please refer to Section 2.0 of Schedule 5 to this application.
[51] A list of the programs and projects which were deferred or cancelled for the 2027 CBA is provided in Section 5.1.1.

Capital budget estimates and actual expenditures may differ for a number of reasons, including but not limited to:

- Differences in quoted and actual tendered material and contract pricing;
- Changes in market conditions (e.g., tariffs, inflationary pressure, supply chain disruptions); and
- Refinement of project scope.

In accordance with estimating best practices, Hydro includes contingency[52] within its proposed budgets based on the level of confidence in individual component costs, resulting in project contingencies generally ranging from 10% to 15%.[53]

To determine the accuracy range of Hydro's capital estimates, in 2026, Hydro completed a statistical analysis of variances based on available data for programs and projects proposed and completed since 2017. Hydro's analysis has determined that its average variance is 1.4%, with a standard deviation of approximately +/-60%. Therefore, Hydro's expected estimated accuracy range is approximately +61%/-59%.[54]

Hydro acknowledges that the Board "expects that Hydro will incorporate any lessons learned from previous capital budget applications and how they may be applied in future applications."[55] To support this expectation, Hydro has made a concerted effort in its 2027 CBA to focus on incorporating trends in cost volatility and increases through the use of current year execution information where historical information would have been used in the past.

[52] The AACE defines a contingency as "an amount added to an estimate to allow for items, conditions, or events for which the state, occurrence, or effect is uncertain and that experience shows will likely result, in the aggregate, in additional costs. Typically estimated using statistical analysis or judgment based on past asset or project experience."
[53] Prior to the 2019 CBA, Hydro generally included 20% contingency in its capital budget estimates.
[54] This excludes projects and programs that have a modified scope or cancelled scope, scope of work associated with Hydro's In-Service Failure programs, and supplemental projects.
[55] Board Order No. P.U. 2(2026), p. 19/20–22.

6.0 2027 Capital Budget

The 2027 CBA contains 130 projects and programs,[56] as outlined in Appendix A. The total planned 2027 capital expenditure for which Hydro is seeking approval in its 2027 CBA is $156.4 million.[57]

Chart 14 shows the 2027 capital budget summary by major asset category.

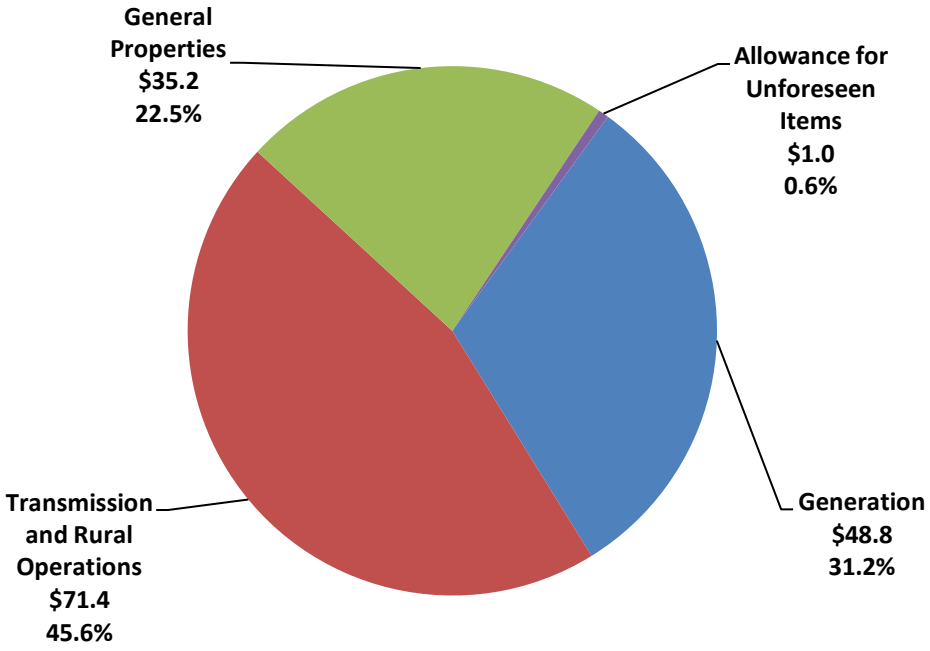


Chart 14: 2027 Capital Budget Summary by Major Asset Category ($ Millions)[58]

The majority of 2027 expenditures are in the areas of Generation and Transmission and Rural Operation ("TRO"). This is primarily a reflection of projects to maintain the safe and reliable operation of the Holyrood TGS, and the continuation of Hydro's asset renewal projects and programs, particularly to address aging hydraulic plant, terminal station, and distribution infrastructure.

[56] Including projects less than $750,000.
[57] The 2027 CBA also includes front-end engineering and design expenditures, necessary to support the development of proposals, on a number of projects. Hydro will not capitalize such costs related to a project if the project does not receive Board approval.
[58] Numbers may not add due to rounding.

The discussion of proposed capital expenditures herein is primarily organized by investment classification, with a discussion of the asset categories and specific projects or programs driving investment within each investment classification.

Chart 15 shows the 2027 capital budget summary by investment classification.

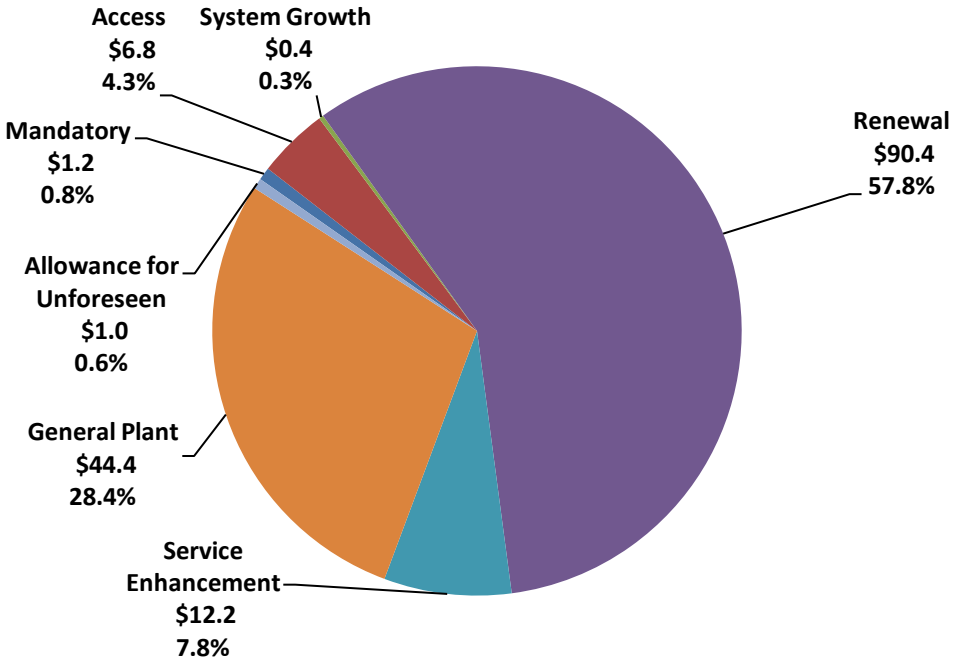


Chart 15: 2027 Capital Budget Summary by Investment Classification ($ Millions)[59]

The majority of Hydro's capital budget expenditures relate to asset renewal, consistent with Hydro's capital investment strategy and is reflective of both the age of Hydro's assets as well as the mix of asset type, and General Plant, driven primarily by the continuation of Hydro's projects to purchase mobile equipment and for renewal of light- and heavy-duty vehicles.

6.1 Renewal

Programs and projects classified as "Renewal" are those that are required to replace and/or refurbish system assets to maintain the ability to provide customers with their current electricity services. As Hydro's assets age, its capital investment strategy aims largely to sustain current system-level reliability by renewal-driven capital investment; therefore, expenditures in this area make up the majority of its

[59] Numbers may not add due to rounding.

capital budget projections, consistent with previous years. Hydro's renewal expenditures account for approximately 58% of Hydro's total 2027 capital budget investment, totalling $90.4 million. Hydro's proposed 2027 renewal investment by asset category is provided in Chart 16.

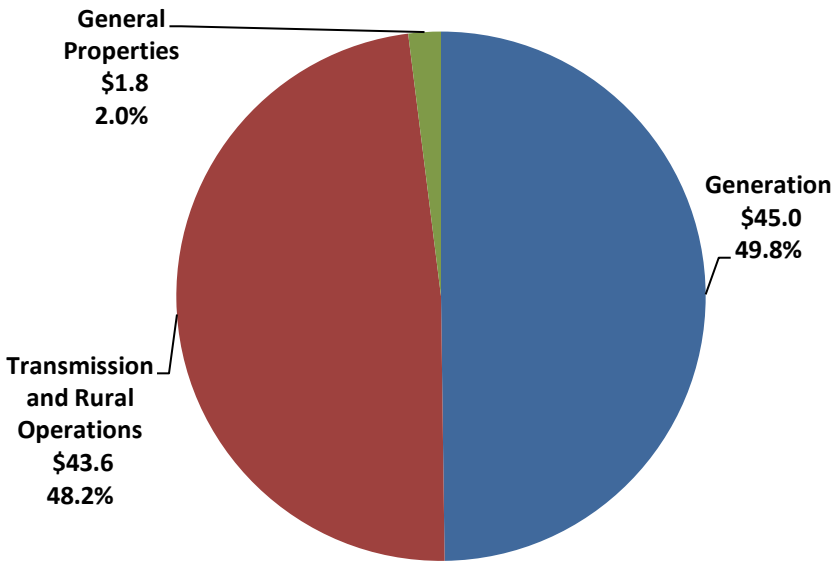


Chart 16: 2027 Renewal Investment by Asset Category ($ Millions)[60]

6.1.1 Generation

Generation renewal investment for 2027 is comprised of investments in Hydro's hydraulic plant, thermal plant, and combustion turbine assets. Hydro's proposed generation-related renewal expenditures account for almost half of its total proposed 2027 renewal expenditures, totalling $45.0 million.

Thermal plant renewal associated with sustaining capital investment at the Holyrood TGS accounts for $31.1 million in 2027. As Hydro expects continued operation of all three units at the Holyrood TGS during the Bridging Period, until its capacity can be adequately replaced, to ensure reliable operation for customers, capital expenditures for this facility to operate as a generator continue to be required. The investment prescribed in this application reflects that which is necessary and prudent to meet this commitment. Key renewal expenditures for thermal plant assets include overhaul of turbine valves and

[60] Numbers may not add due to rounding.

generator, and continuation of the "Perform Boiler Condition Assessment and Miscellaneous Upgrades Project" and "Thermal In-Service Failures Program."[61]

Hydro's regulated capital program is responsible for sustaining capital investment in Hydro's six hydroelectric generating facilities, totalling approximately 960 MW of installed capacity. As such, considerable resources must be allocated to ensure safe, reliable output at these plants. Hydraulic plant renewal accounts for $11.6 million of Hydro's overall proposed capital expenditures for 2027. Key drivers of hydraulic generation renewal investment include the Overhaul Hydraulic Units Project and Hydraulic In-Service Failures Program.[62]

The remainder of Hydro's generation assets consists of four CTs. These assets account for $2.3 million of renewal-related expenditures in 2027 and include work to maintain the reliable operation of the Hardwoods GT, overhaul the main enclosure for Stephenville GT, and continuation of the CT In-Service Failures Program.

6.1.2 Transmission and Rural Operations

Hydro maintains over 4,400 kilometres of transmission lines and 69 terminal stations for the Island and Labrador Interconnected Systems, as well as distribution and isolated generation assets that service almost 40,000 customers in Newfoundland and Labrador. As such, much like generation activities, TRO require considerable capital expenditures to maintain these assets. Approximately half, or $43.6 million, of Hydro's total proposed 2027 renewal expenditures are allocated to this category.

Hydro's TRO renewal expenditures planned for 2027 are driven primarily by the continuation of its asset renewal projects and programs, such as "Wood Pole Line Management" and "Distribution System In-Service Failures, Miscellaneous Upgrades."

Hydro's 2027 TRO expenditures also include the continuation of programs and projects for renewal of distribution assets, as well as programs to renew isolated generation assets, including diesel genset replacements and renewals.

[61] Further discussion of Hydro's thermal plant investments for 2027 is provided in the Holyrood TGS Overview, included as Schedule 3 of this application.
[62] Further discussion of Hydro's investments in the Bay d'Espoir Hydroelectric Generating Station for 2026 is provided in the Bay d'Espoir Hydroelectric Generating Station Overview, included as Schedule 4 of this application.

Hydro is also proposing the continuation of its programs to address in-service failures of transmission, distribution, diesel, and terminal station assets.

6.2 General Plant

Programs and projects classified as "General Plant" are those related to Hydro's assets that are not part of its generation, transmission, and distribution system. These largely include systems such as water and sewer, fire protection, general maintenance and renovations, property assets such as buildings and roads, and human resource or employee service needs. Hydro's proposed general plant expenditures of $44.4 million account for approximately 28% of Hydro's proposed 2027 capital program. Key drivers of investment are detailed below, with a breakdown of Hydro's proposed 2027 general plant investment by asset category provided in Chart 17.

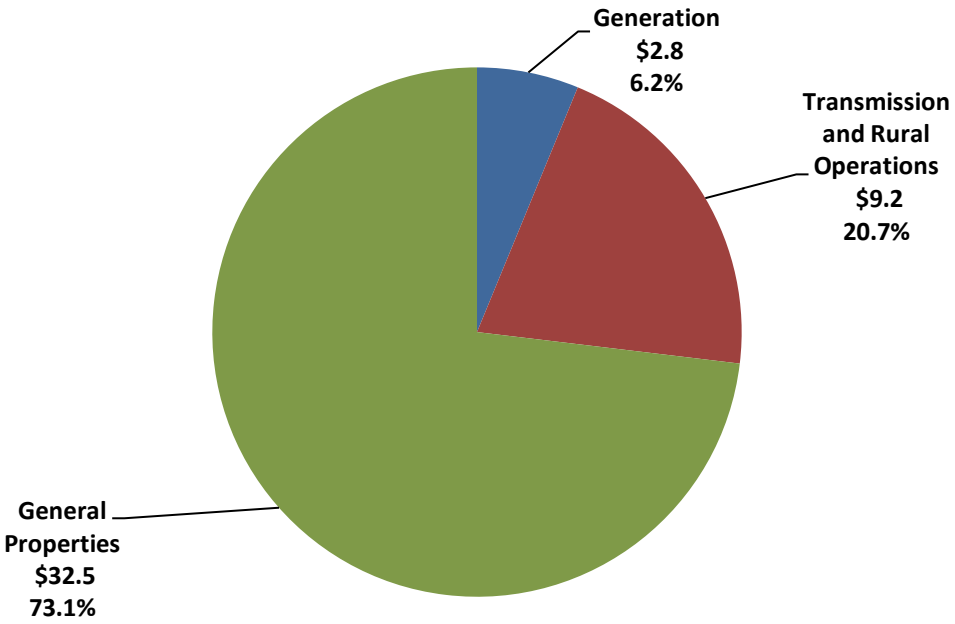


Chart 17: 2027 General Plant Investment by Asset Category ($ Millions)

6.2.1 General Properties

Key drivers of general properties-related investment in 2027 include Hydro's telecontrol and information systems assets, which account for nearly 50% of the planned spend in this area. Telecontrol expenditures include the refurbishment of meteorological stations, replacement of radio links and teleprotection equipment, and Hydro's programs to replace battery banks and network communications equipment. Information System expenditures include the continuation of programs and projects to upgrade software, cybersecurity, and hardware infrastructure, including personal computers. Updates to these systems and assets are crucial to protect against external threats, as well as ensuring access to the necessary tools and software to support the management of the operation of the electrical system.

The remainder of Hydro's proposed 2027 general properties investment primarily includes Hydro's transportation and properties assets. Transportation expenditures include the continuation of Hydro's light- and heavy-duty vehicle programs, which ensure vehicles are safe and fully operational. Properties-related expenditures in 2027 primarily include the program to perform facilities refurbishments, intended to restore their condition, ensure adherence to regulatory requirements, and extend the service life of its facilities.

6.2.2 Transmission and Rural Operations

Key drivers of general plant-related investments within TRO are new and previously approved projects predominantly relating to the refurbishment of buildings and critical safety systems supporting these operational areas.

TRO-related general plant investment includes Hydro's projects and programs to replace mobile equipment, including the continuation of previously approved projects.

6.3 Service Enhancement

Programs and projects classified as "Service Enhancement" are those which modify Hydro's system to meet system operations requirements in a more efficient and/or effective manner, including those which improve safety or environmental compliance. In 2027, $12.2 million, or about 8%, of planned capital expenditures are related to service enhancement. Hydro's proposed 2027 service enhancements investment by asset category is provided in Chart 18.

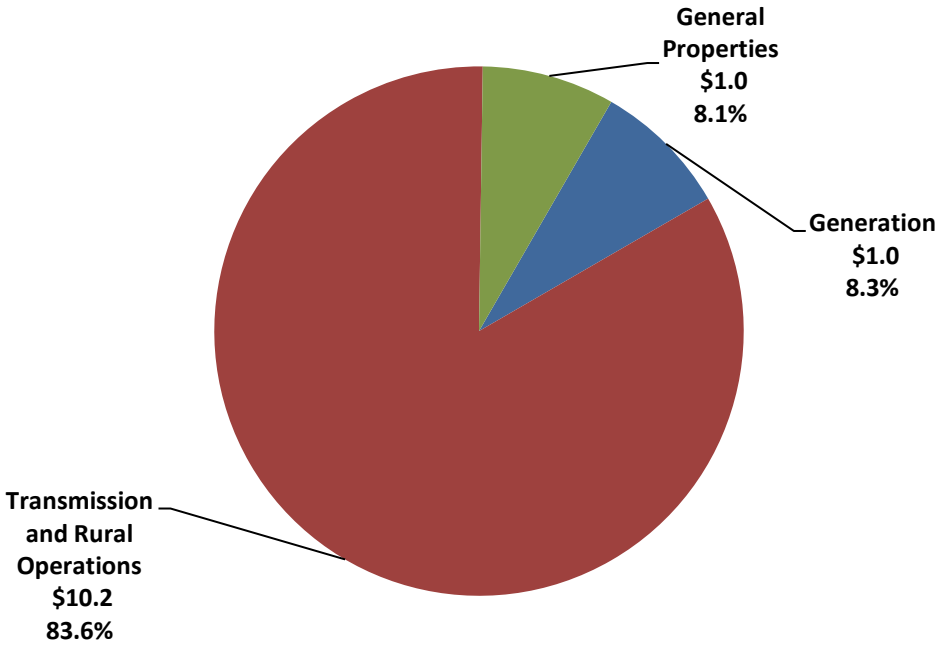


Chart 18: 2027 Service Enhancement Investment by Asset Category ($ Millions)[63]

Primary drivers of service enhancement investment in 2027 include the continuation of Hydro's projects to upgrade its worst-performing distribution feeders.

6.4 Access

Projects and programs classified as "Access" are those required to meet Hydro's obligation to provide customers with access to electricity services. The proposed access capital expenditures for 2027 are primarily associated with Hydro's "Provide Service Extensions Program," under which Hydro executes routine service extensions to new customers who require interconnection to the local distribution system, or customer requests to relocate services. Hydro's proposed access capital expenditures are within the TRO asset category and account for approximately 4% of Hydro's total proposed 2027 capital investment, totalling $6.8 million in 2027.

[63] Numbers may not add due to rounding.

6.5 System Growth

Programs and projects classified as "System Growth" are those required to modify Hydro's system to meet forecast changes in customer electricity resource requirements. Hydro's proposed system growth expenditures of $0.4 million account for approximately 0.3% of Hydro's proposed 2027 capital program. In its 2027 CBA, system growth is 100% TRO-related and includes additions for a load growth project at the existing Cartwright Substation.

6.6 Mandatory

Mandatory projects are those prescribed by a governing body, such as legislative requirements or orders issued by the Board. While these projects are critical, the projected amount required to complete mandatory projects for the upcoming year is minimal, amounting to approximately 0.8% of Hydro's proposed capital investment. In this CBA, mandatory projects are within the TRO asset category and include Hydro's project to upgrade its obsolete PLX metering system in Labrador East, and the continuation of Hydro's program to purchase meters and metering equipment.

6.7 Specifically Assigned Assets for Industrial Customers

A portion of Hydro's asset base is specifically assigned to Industrial customers on the Island and in Labrador. These customers have complex, highly specified needs, making Hydro a key component to their success.

Hydro's 2027 CBA includes the following specifically assigned projects:

- Continuation of Hydro's "Renew Circuit Breakers Program" with replacement of B4L35 in Wabush Terminal Station, specifically assigned to Tacora Resources Inc. ("Tacora"). The total estimated specifically assigned costs for Tacora in 2027 is $680,300.

- Continuation of Hydro's "Replace Protective Relays" and "Renew Circuit Breakers Program" with assets specifically assigned to the Iron Ore Company of Canada ("IOC") to replace breaker B4L6 and L6 line protection in Wabush Terminal Station. The total estimated specifically assigned costs for IOC in 2027 is approximately $1.16 million.

Specifically assigned asset renewals within Hydro's Five-Year Capital Plan (2027–2031) are detailed in Table 9.

Table 9: Specifically Assigned Capital Work[64]

Customer	Specifically Assigned Work	In-Service Year	Program or Project	2027 Specifically Assigned Cost ($000)	Beyond 2027 Specifically Assigned Cost ($000)	Total Remaining Contribution
Tacora	WABTS B4L35 Replacement	2027	Renew Circuit Breakers (2026–2027)	$680.3	-	$680.3
IOC	WABTS L6 Protection	2027	Replace Protective Relays – Various (2026–2027)	$481.9	-	$481.9
IOC	WABTS B4L6 Replacement	2027	Renew Circuit Breakers (2026–2027)	$680.3	-	$680.3
IOC	WABTS B4L7 Refurbishment	2030	Renew Circuit Breakers		$200.0	$200.0
Vale	VBNTS B1T1 Refurbishment	2030	Renew Circuit Breakers		$200.0	$200.0
Vale	VBNTS B1T2 Refurbishment	2031	Renew Circuit Breakers		$200.0	$200.0

6.8 Leasing Costs

There are no capital leasing costs contained in the 2027 CBA.

6.9 Rate Impact Summary

On a *pro-forma* basis, Hydro's 2027 and 2028 total regulated revenue requirement is estimated to increase by approximately $7.6 million and $12.1 million,[65] respectively, as a result of the capital programs and projects proposed for 2027. Such a revenue requirement increase would represent an increase of 1.0% and 1.5% in 2027 and 2028, respectively, relative to Hydro's proposed 2027 Test Year. This assumes $2.9 million of accelerated depreciation associated with 2027 capital projects in 2027, which is a test year, and the deferral in the Holyrood TGS Accelerated Depreciation Deferral in 2028[66] of $8.7 million.

The total forecast revenue requirement impact from the 2027 capital budget for rural areas is approximately $4.0 million in 2028. Based upon the proposed 2027 Test Year Cost of Service Revenue to Cost ratios, it is estimated that rural customers would contribute $2.4 million towards this increase, with

[64] Estimates for future work are preliminary and subject to refinement.
[65] These amounts do not reflect any reduction that may occur as a result of asset retirements or potential changes to operating and maintenance charges.
[66] Due to the extension of the Holyrood TGS through the Bridging Period, Hydro submitted an application to the Board to extend the Holyrood Accelerated Depreciation Deferral Account. The extension of the account and related amendments were approved in Board Order No. P.U. 1(2024). Hydro was also directed to file a report on the account in its next general rate application.

the remainder allocated to the rural deficit and primarily included in Hydro's wholesale rates charged to Newfoundland Power.

Hydro's projected rate impacts as a result of programs and projects proposed in the 2027 CBA, by system, are detailed in Table 10. As a result of the finalization of the Government's rate mitigation plan, announced on May 16, 2024, rate increases at the wholesale level on the Island Interconnected System will be limited to target domestic rate increases of 2.25% annually, attributable to Hydro's costs, up to and including 2030, regardless of the increase in revenue requirement.

Table 10: Projected Wholesale Rate Impact by System (%)

System	2027	2028
Island Interconnected System	0.9	1.3
Labrador Interconnected – Rural	0.8	2.1
Labrador Industrial – Regulated[67]	1.5	3.9
Labrador Industrial – Total Billings	0.2	0.6

Hydro's ten-year historical Island Interconnected Wholesale Electricity Rate and Labrador Interconnected Electricity Rate for the years 2016–2025 are presented in Chart 19.

[67] Labrador Industrial – Regulated represents the estimated percentage impact on the regulated demand rate charged to Labrador Industrial customers, whereas Labrador Industrial – Total Billings represents the estimated percentage impact on the overall total bill charged to Labrador Industrial customers.

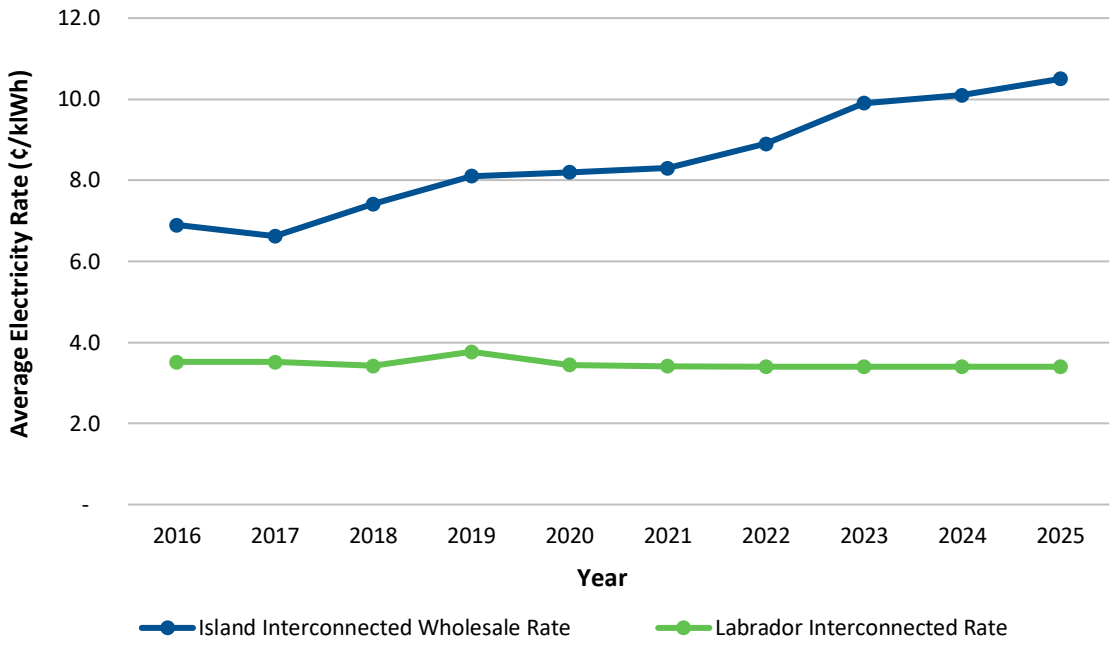


Chart 19: Ten-Year Historical Electricity Rates (¢/kWh)

7.0 Risk Evaluation and Ranking

7.1 Prioritization and Ranking

Hydro's prioritization process includes two primary steps—an initial review of proposed programs and projects to critically evaluate scope and need, followed by a prioritization of programs and projects through Hydro's matrix model.[68] Within the Guidelines, the Board has provided guidance for evaluating risk and mitigation, as well as prioritization.[69] The matrix model scores programs and projects based on reliability, safety, or environmental risk, based on a judgment of the probability of a given risk materializing. Hydro's Capital Risk Assessment Matrix is provided in Appendix G.

Hydro assessed risks pre- and post-implementation of the capital investments proposed in the 2027 CBA and has calculated the risk mitigation as the difference between pre- and post-implementation risk. For projects with undefined scope, such as in-service failure projects, Hydro assumes an average level of likelihood and impact based on the historical execution experience of these programs. Hydro has also

[68] Hydro's Corporate Risk Assessment Matrix is aligned with the ISO 31000 Risk Management Standard, in accordance with the Guidelines.
[69] Hydro is unable to provide a prioritization of projects and programs by reliability improvement per dollar spent, as the relationship between individual assets and system reliability is often not a direct relationship, and is also often complex.

calculated the risk mitigated per $1 million of expenditure for each program or project. Appendix G provides the prioritization of programs and projects proposed in the 2027 CBA by risk mitigated per $1 million and also includes a prioritization of programs and projects proposed on the basis of risk mitigated.

8.0 Conclusion

Hydro is requesting approval for $156.4 million of capital investment in its 2027 CBA, driven primarily by the need for increased investment in asset renewal and increasing costs associated with a period of sustained high inflation in recent years. Hydro's capital investment strategy aims largely to sustain current system-level reliability by undertaking renewal-driven capital investment. When supported by least-cost and risk evaluation, Hydro's capital investment strategy proposes targeted, service enhancement investments to address specific issues impacting system-level or localized reliability.

In the interest of balancing cost and reliability, Hydro has carefully considered its capital investment portfolio for its 2027 CBA and has deferred or cancelled 26 projects, which corresponds to over $29.2 million[70] in capital investment in 2027.[71]

While Hydro's expenditures will increase, in part, due to the infrastructure required to meet growing electricity needs and to maintain reliability, the impacts on customers will be limited as a result of the Government's rate mitigation plan.[72] Hydro continues to focus on effective cost management and identifying opportunities to minimize impacts to customers.

The proposals presented within this application align with Hydro's mandate to provide safe, reliable and least-cost service in an environmentally responsible manner and support Hydro's focus to maintain the level of reliability expected while ensuring prudent and reasonable expenditures. Hydro believes that all of the expenditures proposed in its 2027 CBA are prudent and necessary for the safe and reliable operation of the electrical system.

[70] This number was derived from Class 5 estimates, and the true amount of deferred investment is likely higher. Note that this total does not include proposals which have been cancelled due to scopes being included under other capital projects.
[71] A list of the programs and projects which were deferred or cancelled for the 2027 CBA is provided in Section 5.1.1.
[72] Through to and including 2030, the Government has committed to target domestic rate increases limited to 2.25% annually.

Appendix A

2027 Capital Budget by Investment Classification, Major and Minor Asset Category, Materiality, and Programs and Projects



Newfoundland and Labrador Hydro
2027 Capital Budget Application
Summary by Investment Classification[1]
($000)

	2026 and Prior Years	2027	Future Years	Total
Access	408.7	6,769.4	-	**7,178.1**
Allowance for Unforeseen	-	1,000.0	-	**1,000.0**
General Plant	15,683.3	44,400.3	23,012.2	**83,095.8**
Mandatory	1,188.8	1,223.4	494.3	**2,906.5**
Renewal	10,895.9	90,353.4	44,427.6	**145,676.9**
Service Enhancement	8,391.8	12,166.1	6,083.5	**26,641.4**
System Growth	-	442.7	-	**442.7**
Total Capital Budget	**36,568.5**	**156,355.3**	**74,017.6**	**266,941.4**

[1] Numbers may not add due to rounding.

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Summary by Major and Minor Asset Category[1]
($000)

	2026 and Prior Years	2027	Future Years	Total
Allowance for Unforeseen Items				
Allowance for Unforeseen Items	-	1,000.0	-	**1,000.0**
Allowance for Unforeseen Items Total	**-**	**1,000.0**	**-**	**1,000.0**
General Properties				
Administration	-	1,858.5	-	**1,858.5**
Information Systems	1,656.5	12,700.9	1,091.0	**15,448.4**
Properties	190.6	4,953.3	7,310.4	**12,454.3**
Telecontrol	3,643.2	4,799.4	2,986.7	**11,429.3**
Tools and Equipment	-	2,176.0	-	**2,176.0**
Transportation	8,462.0	8,745.6	5,518.5	**22,726.1**
General Properties Total	**13,952.3**	**35,233.7**	**16,906.6**	**66,092.6**
Generation				
Combustion Turbines	375.1	2,886.3	203.9	**3,465.3**
Hydraulic Plant	2,693.4	14,839.6	17,579.5	**35,112.5**
Thermal Plant	1,330.9	31,027.4	-	**32,358.3**
Generation Total	**4,399.4**	**48,753.3**	**17,783.4**	**70,936.1**
Transmission and Rural Operations				
Distribution	8,536.6	23,889.1	9,197.2	**41,622.9**
Generation	2,148.8	9,828.8	5,152.9	**17,130.5**
Metering	1,188.8	1,223.4	494.3	**2,906.5**
Terminal Stations	3,484.7	13,312.6	12,893.5	**29,690.8**
Tools and Equipment	2,202.0	8,550.2	2,691.5	**13,443.7**
Transmission	655.9	14,564.2	8,898.2	**24,118.3**
Transmission and Rural Operations Total	**18,216.8**	**71,368.3**	**39,327.6**	**128,912.7**
Total Capital Budget	**36,568.5**	**156,355.3**	**74,017.6**	**266,941.4**

[1] Numbers may not add due to rounding.

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Summary by Materiality[1]
($000)

	2026 and Prior Years	2027	Future Years	Total
Over $5 Million				
Access	-	5,816.7	-	**5,816.7**
General Plant	6,418.6	7,120.1	5,730.1	**19,268.8**
Renewal	2,725.0	40,231.9	15,634.9	**58,591.8**
Service Enhancement	6,356.3	2,529.8	-	**8,886.1**
Over $5 Million Total	**15,499.9**	**55,698.5**	**21,365.0**	**92,563.4**
$1 Million to $5 Million				
Access	408.7	952.7	-	**1,361.4**
Allowance for Unforeseen	-	1,000.0	-	**1,000.0**
General Plant	8,240.2	26,554.1	15,162.8	**49,957.1**
Mandatory	1,188.8	485.8	494.3	**2,168.9**
Renewal	6,210.9	43,508.7	26,843.1	**76,562.7**
Service Enhancement	1,133.2	7,906.1	5,549.4	**14,588.7**
$1 Million to $5 Million Total	**17,181.8**	**80,407.4**	**48,049.6**	**145,638.8**
$750,000 to $1 Million				
General Plant	250.1	2,880.9	385.8	**3,516.8**
Renewal	-	1,806.5	-	**1,806.5**
$750,000 to $1 Million Total	**250.1**	**4,687.4**	**385.8**	**5,323.3**
Under $750,000				
General Plant	774.3	7,845.3	1,733.5	**10,353.1**
Mandatory	-	737.6	-	**737.6**
Renewal	1,960.0	4,806.3	1,949.6	**8,715.9**
Service Enhancement	902.3	1,730.2	534.1	**3,166.6**
System Growth	-	442.7	-	**442.7**
Under $750,000 Total	**3,636.6**	**15,562.1**	**4,217.2**	**23,415.9**
Total Capital Budget	**36,568.5**	**156,355.3**	**74,017.6**	**266,941.4**

[1] Numbers may not add due to rounding.

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Summary by Programs and Projects[1]
($000)

	2026 and Prior Years	2027	Future Years	Total
Program				
Access	-	5,816.7	-	**5,816.7**
Allowance for Unforeseen	-	1,000.0	-	**1,000.0**
General Plant	11,778.7	22,519.0	6,396.8	**40,694.5**
Mandatory	-	737.6	-	**737.6**
Renewal	3,819.4	41,677.6	8,726.4	**54,223.4**
Service Enhancement	6,356.3	2,840.6	-	**9,196.9**
Program Total	**21,954.4**	**74,591.5**	**15,123.2**	**111,669.1**
Project				
Access	408.7	952.7	-	**1,361.4**
General Plant	3,904.6	21,881.3	16,615.4	**42,401.3**
Mandatory	1,188.8	485.8	494.3	**2,168.9**
Renewal	7,076.5	48,675.8	35,701.2	**91,453.5**
Service Enhancement	2,035.5	9,325.5	6,083.5	**17,444.5**
System Growth	-	442.7	-	**442.7**
Project Total	**14,614.1**	**81,763.8**	**58,894.4**	**155,272.3**
Total Capital Budget	**36,568.5**	**156,355.3**	**74,017.6**	**266,941.4**

[1] Numbers may not add due to rounding.

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Detailed Breakdown By Investment Classification[1]
($000)

	2026 and Prior Years	2027	Future Years	Total
Access				
Provide Service Extensions (2027)	-	5,816.7	-	**5,816.7**
Upgrade Distribution System (2026-2027) - Wiltondale	408.7	952.7	-	**1,361.4**
Access Total	**408.7**	**6,769.4**	**-**	**7,178.1**
Allowance for Unforeseen				
Allowance for Unforeseen Items (2027)	-	1,000.0	-	**1,000.0**
Allowance for Unforeseen Total	**-**	**1,000.0**	**-**	**1,000.0**
General Plant				
Clarity Replacement (2027)	-	474.6	-	**474.6**
Construct Pole Storage Ramps (2027-2028) - Happy Valley	-	58.9	336.6	**395.5**
Install CCTV Systems (2027)	-	553.3	-	**553.3**
Install Electric Vehicle Chargers (2027-2028) - Hydro Sites	-	274.5	326.1	**600.6**
Install Fire Protection in 230 kV Stations (2027-2028) - Bottom Brook	-	73.8	578.3	**652.1**
Migrate Legacy Applications (2027)	-	988.2	-	**988.2**
Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2027)	-	992.4	-	**992.4**
Perform Accessibility Upgrades (2027)	-	555.3	-	**555.3**
Perform Facilities Refurbishments (2027)	-	1,470.2	-	**1,470.2**
Perform Minor Telecommunications Enhancements (2027)	-	157.1	-	**157.1**
Perform Software Upgrades and Minor Enhancements - Information Technology (2026-2027)	649.9	1,097.2	-	**1,747.1**
Perform Software Upgrades and Minor Enhancements - Information Technology (2027-2028)	-	1,298.0	249.4	**1,547.4**
Perform Software Upgrades and Minor Enhancements - Operational Technology (2027)	-	274.8	-	**274.8**
Procure Accommodations (2027) - Postville	-	732.5	-	**732.5**
Procurement of Lidar for Digitization of Transmission Lines (2027)	-	500.0	-	**500.0**
Purchase Mobile Devices (2027)	-	327.0	-	**327.0**
Purchase Personal Computers (2027)	-	1,649.6	-	**1,649.6**
Purchase Tools and Equipment (2027)	-	2,176.0	-	**2,176.0**
Refurbish Intake Access Road (2027-2028) - Bay d'Espoir	-	465.0	2,796.8	**3,261.8**
Refurbish Meteorological Stations - Phase 2 (2026-2027)	528.1	167.4	-	**695.5**
Replace 48 V Battery Banks and Chargers (2026-2027)	250.1	524.4	-	**774.5**
Replace 48 V Battery Banks and Chargers (2027-2028)	-	52.3	428.9	**481.2**
Replace Back-up Generators at Microwave Repeater Sites (2026-2027)	94.5	391.3	-	**485.8**
Replace Cisco Call Manager Appliances (2027)	-	213.5	-	**213.5**
Replace GRID Application (2026-2027)	134.9	363.9	-	**498.8**
Replace Heavy-Duty Mobile Equipment (2026-2028)	173.8	1,809.7	2,112.2	**4,095.7**
Replace Heavy-Duty Mobile Equipment (2027-2028)	-	1,996.2	579.3	**2,575.5**
Replace Heavy-Duty Vehicles (2026-2028)	1,524.1	788.5	2,204.4	**4,517.0**
Replace Heavy-Duty Vehicles (2027-2029)	-	835.4	2,612.5	**3,447.9**
Replace Light- and Heavy-Duty Vehicles (2025-2027)	4,390.4	3,447.2	-	**7,837.6**
Replace Light-Duty Mobile Equipment (2027)	-	1,542.0	-	**1,542.0**
Replace Light-Duty Vehicles (2026-2027)	2,547.5	548.6	-	**3,096.1**
Replace Light-Duty Vehicles (2027-2028)	-	3,125.9	701.6	**3,827.5**
Replace Mobile Equipment (2025-2027)	2,028.2	3,202.3	-	**5,230.5**
Replace Network Communications Equipment (2026-2027)	1,038.4	99.0	-	**1,137.4**
Replace Network Communications Equipment (2027-2028)	-	624.6	63.6	**688.2**
Replace Peripheral Infrastructure (2027)	-	461.8	-	**461.8**
Replace Power Line Carrier (2027-2029) - TL212	-	154.9	1,971.8	**2,126.7**
Replace Radio Link to Hydraulic Control Structure (2026-2027) - Ebbegunbaeg	470.5	756.8	-	**1,227.3**
Replace Roof (2027-2028) - Cartwright	-	214.5	1,254.2	**1,468.7**
Replace Teleprotection Equipment (2026-2028)	964.4	310.6	224.8	**1,499.8**
Replace Walkway to Toe of Dam (2026-2027) - Paradise River	16.8	566.1	-	**582.9**
Stabilize Powerhouse Slope (2027) - Cat Arm	-	1,729.8	-	**1,729.8**
SWOP Replacement (2027-2028)	-	1,053.9	455.8	**1,509.7**
Telecommunications In-Service Failures (2027)	-	118.8	-	**118.8**
Update Cybersecurity Infrastructure (2027)	-	342.6	-	**342.6**
Upgrade Core Information Technology Infrastructure (2027)	-	2,909.4	-	**2,909.4**
Upgrade Core IT Infrastructure (2026-2027)	871.6	522.9	-	**1,394.5**
Upgrade Core Operational Technology Infrastructure (2027)	-	561.2	-	**561.2**
Upgrade Energy Management System (2027-2028)	-	375.9	385.8	**761.7**
Upgrade Line Depot (2027-2029) - Bay d'Espoir	-	470.6	5,730.1	**6,200.7**
General Plant Total	**15,683.3**	**44,400.3**	**23,012.2**	**83,095.8**

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Detailed Breakdown By Investment Classification[1]
($000)

	2026 and Prior Years	2027	Future Years	Total
Mandatory				
Purchase Meters and Metering Equipment (2027)	-	737.6	-	**737.6**
Upgrade PLX Metering System (2026-2028) - Labrador East	1,188.8	485.8	494.3	**2,168.9**
Mandatory Total	**1,188.8**	**1,223.4**	**494.3**	**2,906.5**
Renewal				
Combustion Turbine In-Service Failures (2027)	-	1,038.0	-	**1,038.0**
Diesel In-Service Failures (2027)	-	1,256.9	-	**1,256.9**
Distribution System In-Service Failures and Miscellaneous Upgrades (2027)	-	6,665.2	-	**6,665.2**
Hydraulic In-Service Failures (2027)	-	3,353.5	-	**3,353.5**
Inspect Fuel Storage Tanks (2027-2028) - Makkovik	-	187.5	2,586.3	**2,773.8**
Install Breaker Failure Protection (2027-2028)	-	993.1	1,523.7	**2,516.8**
L23/24 Steel-Tower Transmission Line Renewal (2026-2029)	576.2	2,735.3	5,265.9	**8,577.4**
Overhaul Generator - Unit 3 (2027) - Holyrood	-	3,823.8	-	**3,823.8**
Overhaul Hydraulic Units (2027)	-	4,436.5	-	**4,436.5**
Overhaul Main Enclosure (2027) - Stephenville	-	975.4	-	**975.4**
Overhaul Major Pumps and Associated Motors (2027) - Holyrood	-	3,355.2	-	**3,355.2**
Overhaul Marine Terminal Loading Arms (2027) - Holyrood	-	831.1	-	**831.1**
Overhaul Turbine Valves - Unit 1 (2027) - Holyrood	-	7,973.1	-	**7,973.1**
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2027) - Holyrood	-	10,119.7	-	**10,119.7**
Perform Dam Infrastructure Refurbishments (2027)	-	526.3	-	**526.3**
Perform Level 2 Condition Assessment - Condenser and Condenser Tubes (2026-2027) - Holyrood	577.3	51.7	-	**629.0**
Perform Level 2 Condition Assessment - Steel Section (2027) - Paradise River	-	174.0	-	**174.0**
Perform Level 2 Condition Assessment - West Salmon Spillway (2027-2028) - Upper Salmon	-	639.5	29.6	**669.1**
Perform Major Inspection - Synchronous Condenser 1 (2026-2027) - Wabush Terminal Station	43.0	700.7	-	**743.7**
Perform Major Inspection - Synchronous Condenser 2 (2027-2028) - Wabush Terminal Station	-	63.6	661.3	**724.9**
Refurbish Aluminum Towers (2027-2028) - TL212	-	165.7	2,591.3	**2,757.0**
Refurbish Draft Tube Deck - Phase 3 (2027-2029) - Bay d'Espoir	-	159.6	1,645.4	**1,805.0**
Refurbish MD-1 (2027-2030) - Ebbegunbaeg	-	665.8	10,369.0	**11,034.8**
Refurbish Water Treatment Systems (2026-2027) - Holyrood	524.5	936.3	-	**1,460.8**
Renew Circuit Breakers (2026-2028)	188.2	2,250.1	1,975.6	**4,413.9**
Renew Circuit Breakers (2027-2029)	-	130.0	1,820.5	**1,950.5**
Renew Diesel Units (2027)	-	3,642.0	-	**3,642.0**
Renew Distribution Feeders (2026-2027)	1,015.3	3,053.0	-	**4,068.3**
Renew Distribution Feeders (2027-2028)	-	242.9	2,432.7	**2,675.6**
Replace 125VDC Battery Bank (2026-2027) - Hardwoods	108.9	37.8	-	**146.7**
Replace Air Dryer (2026-2027) - Hardwoods	75.2	198.0	-	**273.2**
Replace Annunciator Panel (2027-2028) Upper Salmon	-	141.3	242.9	**384.2**
Replace Battery Bank (2026-2027) - Granite Canal	138.8	44.2	-	**183.0**
Replace Circuit Breaker Reclosing Controllers (2027-2028) - Come by Chance	-	69.1	107.0	**176.1**
Replace DC Fuel Pump (2026-2027) - Hardwoods	90.4	58.4	-	**148.8**
Replace Diesel Gensets (2025-2027)	2,148.8	4,074.8	-	**6,223.6**
Replace Diesel Gensets (2027-2029)	-	224.9	2,566.6	**2,791.5**
Replace Diesel Gensets (2027–2029) - Burnt Dam Spillway	-	475.6	1,516.5	**1,992.1**
Replace Disconnects (2026-2028)	169.1	1,694.0	631.6	**2,494.7**
Replace Disconnects (2027-2029)	-	140.1	1,436.8	**1,576.9**
Replace Emergency Diesel Genset (2025-2027) - Cat Arm	1,487.3	-	-	**1,487.3**
Replace Exciter Controller - SC1 and SC2 (2027-2028) - Wabush	-	467.3	200.4	**667.7**
Replace Hydraulic Lift Pump (2027-2028) - Burnt Dam	-	89.3	160.7	**250.0**
Replace Instrument Transformers (2026-2027)	371.2	196.1	-	**567.3**
Replace Instrument Transformers (2027-2028)	-	72.0	365.3	**437.3**
Replace Parts of Stage 1: 129 Vdc Batteries and Battery Chargers (2026-2027) - Holyrood	229.1	100.1	-	**329.2**
Replace Protective Relays (2026-2027)	616.0	1,969.8	-	**2,585.8**
Replace Protective Relays (2027-2028)	-	700.1	2,314.2	**3,014.3**
Replace Rip Rap on LD-5 (2027) - Salmon River Spillway	-	719.6	-	**719.6**
Replace Roof (2026-2027) - Hopedale	190.6	1,791.0	-	**1,981.6**
Replace T1 (2027-2029) - Burgeo	-	309.9	2,217.1	**2,527.0**
Replace Terminal Station Battery Banks and Chargers (2026-2027)	326.1	236.7	-	**562.8**
Replace Terminal Station Battery Banks and Chargers (2027-2028)	-	26.1	182.4	**208.5**
Terminal Station In-Service Failures (2027)	-	2,203.3	-	**2,203.3**
Thermal In-Service Failures (2027)	-	3,836.4	-	**3,836.4**
Transmission In-Service Failures (2027)	-	194.5	-	**194.5**
Upgrade Power Transformers (2026–2027)	1,705.0	401.8	-	**2,106.8**
Upgrade Power Transformers (2027–2028)	-	518.1	766.2	**1,284.3**
Upgrade Spherical Valve Controls (2026-2029) - Bay d'Espoir	314.9	219.6	818.6	**1,353.1**
Wood Pole Line Management (2027)	-	7,998.0	-	**7,998.0**
Renewal Total	**10,895.9**	**90,353.4**	**44,427.6**	**145,676.9**

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Detailed Breakdown By Investment Classification[1]
($000)

	2026 and Prior Years	2027	Future Years	Total
Service Enhancement				
Distribution Equipment SCADA Additions - Phase I (2027-2028)	-	548.8	822.0	**1,370.8**
Install Intelligent Electronic Devices Management Software (2026-2028)	297.2	675.4	297.6	**1,270.2**
Relocate Section of Line (2026-2028) - TL220	79.7	2,970.7	1,041.0	**4,091.4**
Remove Safety Hazards (2027)	-	310.8	-	**310.8**
Replace Expansion Joint and Rock Scaling (2026-2027) - Paradise River	516.9	230.4	-	**747.3**
Upgrade Blackstart Diesel Instrumentation (2027-2028) - Holyrood	-	234.2	203.9	**438.1**
Upgrade Cooling (2026-2027) - Hardwoods	100.6	344.5	-	**445.1**
Upgrade Excitation System (2026-2027) - Paradise River	218.7	203.5	-	**422.2**
Upgrade Terminal Station for Mobile Substation (2026-2027) - St. Anthony Diesel	66.1	328.6	-	**394.7**
Upgrade Terminal Station for Mobile Substation (2027-2028) - Glenburnie	-	78.2	330.2	**408.4**
Upgrade Worst-Performing Distribution Feeders (2025-2027)	6,356.3	2,529.8	-	**8,886.1**
Upgrade Worst-Performing Distribution Feeders (2026-2027)	756.3	3,534.9	-	**4,291.2**
Upgrade Worst-Performing Distribution Feeders (2027–2028) – Fleur De Lys, Line 1	-	176.3	3,388.8	**3,565.1**
Service Enhancement Total	**8,391.8**	**12,166.1**	**6,083.5**	**26,641.4**
System Growth				
Additions for Load Growth - Upgrade Fuel Storage (2027) - Cartwright	-	442.7	-	**442.7**
System Growth Total	**-**	**442.7**	**-**	**442.7**
Total Capital Budget	**36,568.5**	**156,355.3**	**74,017.6**	**266,941.4**

[1] Numbers may not add due to rounding.

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Detailed Breakdown By Major and Minor Asset Category[1]
($000)

	2026 and Prior Years	2027	Future Years	Total
Allowance for Unforeseen Items				
Allowance for Unforeseen Items				
Allowance for Unforeseen Items (2027)	-	1,000.0	-	1,000.0
Allowance for Unforeseen Items Total	**-**	**1,000.0**	**-**	**1,000.0**
Allowance for Unforeseen Items Total	**-**	**1,000.0**	**-**	**1,000.0**
General Properties				
Administration				
Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2027)	-	992.4	-	992.4
Perform Accessibility Upgrades (2027)	-	555.3	-	555.3
Remove Safety Hazards (2027)	-	310.8	-	310.8
Administration Total	**-**	**1,858.5**	**-**	**1,858.5**
Information Systems				
Clarity Replacement (2027)	-	474.6	-	474.6
Migrate Legacy Applications (2027)	-	988.2	-	988.2
Perform Software Upgrades and Minor Enhancements - Information Technology (2026-2027)	649.9	1,097.2	-	1,747.1
Perform Software Upgrades and Minor Enhancements - Information Technology (2027-2028)	-	1,298.0	249.4	1,547.4
Perform Software Upgrades and Minor Enhancements - Operational Technology (2027)	-	274.8	-	274.8
Purchase Mobile Devices (2027)	-	327.0	-	327.0
Purchase Personal Computers (2027)	-	1,649.6	-	1,649.6
Replace GRID Application (2026-2027)	134.9	363.9	-	498.8
Replace Peripheral Infrastructure (2027)	-	461.8	-	461.8
SWOP Replacement (2027-2028)	-	1,053.9	455.8	1,509.7
Update Cybersecurity Infrastructure (2027)	-	342.6	-	342.6
Upgrade Core Information Technology Infrastructure (2027)	-	2,909.4	-	2,909.4
Upgrade Core IT Infrastructure (2026-2027)	871.6	522.9	-	1,394.5
Upgrade Core Operational Technology Infrastructure (2027)	-	561.2	-	561.2
Upgrade Energy Management System (2027-2028)	-	375.9	385.8	761.7
Information Systems Total	**1,656.5**	**12,700.9**	**1,091.0**	**15,448.4**
Properties				
Install Electric Vehicle Chargers (2027-2028) - Hydro Sites	-	274.5	326.1	600.6
Perform Facilities Refurbishments (2027)	-	1,470.2	-	1,470.2
Procure Accommodations (2027) - Postville	-	732.5	-	732.5
Replace Roof (2026-2027) - Hopedale	190.6	1,791.0	-	1,981.6
Replace Roof (2027-2028) - Cartwright	-	214.5	1,254.2	1,468.7
Upgrade Line Depot (2027-2029) - Bay d'Espoir	-	470.6	5,730.1	6,200.7
Properties Total	**190.6**	**4,953.3**	**7,310.4**	**12,454.3**
Telecontrol				
Install CCTV Systems (2027)	-	553.3	-	553.3
Install Intelligent Electronic Devices Management Software (2026-2028)	297.2	675.4	297.6	1,270.2
Perform Minor Telecommunications Enhancements (2027)	-	157.1	-	157.1
Refurbish Meteorological Stations - Phase 2 (2026-2027)	528.1	167.4	-	695.5
Replace 48 V Battery Banks and Chargers (2026-2027)	250.1	524.4	-	774.5
Replace 48 V Battery Banks and Chargers (2027-2028)	-	52.3	428.9	481.2
Replace Back-up Generators at Microwave Repeater Sites (2026-2027)	94.5	391.3	-	485.8
Replace Cisco Call Manager Appliances (2027)	-	213.5	-	213.5
Replace Network Communications Equipment (2026-2027)	1,038.4	99.0	-	1,137.4
Replace Network Communications Equipment (2027-2028)	-	624.6	63.6	688.2
Replace Power Line Carrier (2027-2029) - TL212	-	154.9	1,971.8	2,126.7
Replace Radio Link to Hydraulic Control Structure (2026-2027) - Ebbegunbaeg	470.5	756.8	-	1,227.3
Replace Teleprotection Equipment (2026-2028)	964.4	310.6	224.8	1,499.8
Telecommunications In-Service Failures (2027)	-	118.8	-	118.8
Telecontrol Total	**3,643.2**	**4,799.4**	**2,986.7**	**11,429.3**
Tools and Equipment				
Purchase Tools and Equipment (2027)	-	2,176.0	-	2,176.0
Tools and Equipment Total	**-**	**2,176.0**	**-**	**2,176.0**

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Detailed Breakdown By Major and Minor Asset Category[1]
($000)

	2026 and Prior Years	2027	Future Years	Total
Transportation				
Replace Heavy-Duty Vehicles (2026-2028)	1,524.1	788.5	2,204.4	4,517.0
Replace Heavy-Duty Vehicles (2027-2029)	-	835.4	2,612.5	3,447.9
Replace Light- and Heavy-Duty Vehicles (2025-2027)	4,390.4	3,447.2	-	7,837.6
Replace Light-Duty Vehicles (2026-2027)	2,547.5	548.6	-	3,096.1
Replace Light-Duty Vehicles (2027-2028)	-	3,125.9	701.6	3,827.5
Transportation Total	**8,462.0**	**8,745.6**	**5,518.5**	**22,726.1**
General Properties Total	**13,952.3**	**35,233.7**	**16,906.6**	**66,092.6**
Generation				
Combustion Turbines				
Combustion Turbine In-Service Failures (2027)	-	1,038.0	-	1,038.0
Overhaul Main Enclosure (2027) - Stephenville	-	975.4	-	975.4
Replace 125VDC Battery Bank (2026-2027) - Hardwoods	108.9	37.8	-	146.7
Replace Air Dryer (2026-2027) - Hardwoods	75.2	198.0	-	273.2
Replace DC Fuel Pump (2026-2027) - Hardwoods	90.4	58.4	-	148.8
Upgrade Blackstart Diesel Instrumentation (2027-2028) - Holyrood	-	234.2	203.9	438.1
Upgrade Cooling (2026-2027) - Hardwoods	100.6	344.5	-	445.1
Combustion Turbines Total	**375.1**	**2,886.3**	**203.9**	**3,465.3**
Hydraulic Plant				
Hydraulic In-Service Failures (2027)	-	3,353.5	-	3,353.5
Overhaul Hydraulic Units (2027)	-	4,436.5	-	4,436.5
Perform Dam Infrastructure Refurbishments (2027)	-	526.3	-	526.3
Perform Level 2 Condition Assessment - Steel Section (2027) - Paradise River	-	174.0	-	174.0
Perform Level 2 Condition Assessment - West Salmon Spillway (2027-2028) - Upper Salmon	-	639.5	29.6	669.1
Refurbish Draft Tube Deck - Phase 3 (2027-2029) - Bay d'Espoir	-	159.6	1,645.4	1,805.0
Refurbish Intake Access Road (2027-2028) - Bay d'Espoir	-	465.0	2,796.8	3,261.8
Refurbish MD-1 (2027-2030) - Ebbegunbaeg	-	665.8	10,369.0	11,034.8
Replace Annunciator Panel (2027-2028) Upper Salmon	-	141.3	242.9	384.2
Replace Battery Bank (2026-2027) - Granite Canal	138.8	44.2	-	183.0
Replace Diesel Gensets (2027–2029) - Burnt Dam Spillway	-	475.6	1,516.5	1,992.1
Replace Emergency Diesel Genset (2025-2027) - Cat Arm	1,487.3	-	-	1,487.3
Replace Expansion Joint and Rock Scaling (2026-2027) - Paradise River	516.9	230.4	-	747.3
Replace Hydraulic Lift Pump (2027-2028) - Burnt Dam	-	89.3	160.7	250.0
Replace Rip Rap on LD-5 (2027) - Salmon River Spillway	-	719.6	-	719.6
Replace Walkway to Toe of Dam (2026-2027) - Paradise River	16.8	566.1	-	582.9
Stabilize Powerhouse Slope (2027) - Cat Arm	-	1,729.8	-	1,729.8
Upgrade Excitation System (2026-2027) - Paradise River	218.7	203.5	-	422.2
Upgrade Spherical Valve Controls (2026-2029) - Bay d'Espoir	314.9	219.6	818.6	1,353.1
Hydraulic Plant Total	**2,693.4**	**14,839.6**	**17,579.5**	**35,112.5**
Thermal Plant				
Overhaul Generator - Unit 3 (2027) - Holyrood	-	3,823.8	-	3,823.8
Overhaul Major Pumps and Associated Motors (2027) - Holyrood	-	3,355.2	-	3,355.2
Overhaul Marine Terminal Loading Arms (2027) - Holyrood	-	831.1	-	831.1
Overhaul Turbine Valves - Unit 1 (2027) - Holyrood	-	7,973.1	-	7,973.1
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2027) - Holyrood	-	10,119.7	-	10,119.7
Perform Level 2 Condition Assessment - Condenser and Condenser Tubes (2026-2027) - Holyrood	577.3	51.7	-	629.0
Refurbish Water Treatment Systems (2026-2027) - Holyrood	524.5	936.3	-	1,460.8
Replace Parts of Stage 1: 129 Vdc Batteries and Battery Chargers (2026-2027) - Holyrood	229.1	100.1	-	329.2
Thermal In-Service Failures (2027)	-	3,836.4	-	3,836.4
Thermal Plant Total	**1,330.9**	**31,027.4**	**-**	**32,358.3**
Generation Total	**4,399.4**	**48,753.3**	**17,783.4**	**70,936.1**
Transmission and Rural Operations				
Distribution				
Construct Pole Storage Ramps (2027-2028) - Happy Valley	-	58.9	336.6	395.5
Distribution Equipment SCADA Additions - Phase I (2027-2028)	-	548.8	822.0	1,370.8
Distribution System In-Service Failures and Miscellaneous Upgrades (2027)	-	6,665.2	-	6,665.2
Provide Service Extensions (2027)	-	5,816.7	-	5,816.7
Renew Distribution Feeders (2026-2027)	1,015.3	3,053.0	-	4,068.3
Renew Distribution Feeders (2027-2028)	-	242.9	2,432.7	2,675.6
Replace T1 (2027-2029) - Burgeo	-	309.9	2,217.1	2,527.0
Upgrade Distribution System (2026-2027) - Wiltondale	408.7	952.7	-	1,361.4
Upgrade Worst-Performing Distribution Feeders (2025-2027)	6,356.3	2,529.8	-	8,886.1
Upgrade Worst-Performing Distribution Feeders (2026-2027)	756.3	3,534.9	-	4,291.2
Upgrade Worst-Performing Distribution Feeders (2027–2028)	-	176.3	3,388.8	3,565.1
Distribution Total	**8,536.6**	**23,889.1**	**9,197.2**	**41,622.9**

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Detailed Breakdown By Major and Minor Asset Category[1]
($000)

	2026 and Prior Years	2027	Future Years	Total
Generation				
Additions for Load Growth - Upgrade Fuel Storage (2027) - Cartwright	-	442.7	-	442.7
Diesel In-Service Failures (2027)	-	1,256.9	-	1,256.9
Inspect Fuel Storage Tanks (2027-2028) - Makkovik	-	187.5	2,586.3	2,773.8
Renew Diesel Units (2027)	-	3,642.0	-	3,642.0
Replace Diesel Gensets (2025-2027)	2,148.8	4,074.8	-	6,223.6
Replace Diesel Gensets (2027-2029)	-	224.9	2,566.6	2,791.5
Generation Total	**2,148.8**	**9,828.8**	**5,152.9**	**17,130.5**
Metering				
Purchase Meters and Metering Equipment (2027)	-	737.6	-	737.6
Upgrade PLX Metering System (2026-2028) - Labrador East	1,188.8	485.8	494.3	2,168.9
Metering Total	**1,188.8**	**1,223.4**	**494.3**	**2,906.5**
Terminal Stations				
Install Breaker Failure Protection (2027-2028)	-	993.1	1,523.7	2,516.8
Install Fire Protection in 230 kV Stations (2027-2028) - Bottom Brook	-	73.8	578.3	652.1
Perform Major Inspection - Synchronous Condenser 1 (2026-2027) - Wabush Terminal Station	43.0	700.7	-	743.7
Perform Major Inspection - Synchronous Condenser 2 (2027-2028) - Wabush Terminal Station	-	63.6	661.3	724.9
Renew Circuit Breakers (2026-2028)	188.2	2,250.1	1,975.6	4,413.9
Renew Circuit Breakers (2027-2029)	-	130.0	1,820.5	1,950.5
Replace Circuit Breaker Reclosing Controllers (2027-2028) - Come by Chance	-	69.1	107.0	176.1
Replace Disconnects (2026-2028)	169.1	1,694.0	631.6	2,494.7
Replace Disconnects (2027-2029)	-	140.1	1,436.8	1,576.9
Replace Exciter Controller - SC1 and SC2 (2027-2028) - Wabush	-	467.3	200.4	667.7
Replace Instrument Transformers (2026-2027)	371.2	196.1	-	567.3
Replace Instrument Transformers (2027-2028)	-	72.0	365.3	437.3
Replace Protective Relays (2026-2027)	616.0	1,969.8	-	2,585.8
Replace Protective Relays (2027-2028)	-	700.1	2,314.2	3,014.3
Replace Terminal Station Battery Banks and Chargers (2026-2027)	326.1	236.7	-	562.8
Replace Terminal Station Battery Banks and Chargers (2027-2028)	-	26.1	182.4	208.5
Terminal Station In-Service Failures (2027)	-	2,203.3	-	2,203.3
Upgrade Power Transformers (2026–2027)	1,705.0	401.8	-	2,106.8
Upgrade Power Transformers (2027–2028)	-	518.1	766.2	1,284.3
Upgrade Terminal Station for Mobile Substation (2026-2027) - St. Anthony Diesel	66.1	328.6	-	394.7
Upgrade Terminal Station for Mobile Substation (2027-2028) - Glenburnie	-	78.2	330.2	408.4
Terminal Stations Total	**3,484.7**	**13,312.6**	**12,893.5**	**29,690.8**
Tools and Equipment				
Replace Heavy-Duty Mobile Equipment (2026-2028)	173.8	1,809.7	2,112.2	4,095.7
Replace Heavy-Duty Mobile Equipment (2027-2028)	-	1,996.2	579.3	2,575.5
Replace Light-Duty Mobile Equipment (2027)	-	1,542.0	-	1,542.0
Replace Mobile Equipment (2025-2027)	2,028.2	3,202.3	-	5,230.5
Tools and Equipment Total	**2,202.0**	**8,550.2**	**2,691.5**	**13,443.7**
Transmission				
L23/24 Steel-Tower Transmission Line Renewal (2026-2029)	576.2	2,735.3	5,265.9	8,577.4
Procurement of Lidar for Digitization of Transmission Lines (2027)	-	500.0	-	500.0
Refurbish Aluminum Towers (2027-2028) - TL212	-	165.7	2,591.3	2,757.0
Relocate Section of Line (2026-2028) - TL220	79.7	2,970.7	1,041.0	4,091.4
Transmission In-Service Failures (2027)	-	194.5	-	194.5
Wood Pole Line Management (2027)	-	7,998.0	-	7,998.0
Transmission Total	**655.9**	**14,564.2**	**8,898.2**	**24,118.3**
Transmission and Rural Operations Total	**18,216.8**	**71,368.3**	**39,327.6**	**128,912.7**
Total Capital Budget	**36,568.5**	**156,355.3**	**74,017.6**	**266,941.4**

[1] Numbers may not add due to rounding.

Appendix B

2027 Capital Budget by Single- and Multi-Year Programs and Projects



Newfoundland and Labrador Hydro
2027 Capital Budget Application
Single- and Multi-Year Programs and Projects[1]
($000)

	2027
Single-Year	
Access	5,816.7
Allowance for Unforeseen	1,000.0
General Plant	18,730.1
Mandatory	737.6
Renewal	63,122.5
Service Enhancement	310.8
System Growth	442.7
Single-Year Total	**90,160.4**
Multi-Year (2027) Expenditures	
Multi-Year Projects Commencing in 2023	-
Multi-Year Projects Commencing in 2024	-
Multi-Year Projects Commencing in 2025	13,254.1
Multi-Year Projects Commencing in 2026	34,347.4
Multi-Year Projects Commencing in 2027	18,593.4
Multi-Year (2027) Expenditures Total	**66,194.9**
Total 2027 Capital Budget	**156,355.3**

[1] Numbers may not add due to rounding.

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Single-Year Programs and Projects[1]
($000)

	2027
Access	
Provide Service Extensions (2027)	5,816.7
Access Total	**5,816.7**
Allowance for Unforeseen	
Allowance for Unforeseen Items (2027)	1,000.0
Allowance for Unforeseen Total	**1,000.0**
General Plant	
Clarity Replacement (2027)	474.6
Install CCTV Systems (2027)	553.3
Migrate Legacy Applications (2027)	988.2
Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2027)	992.4
Perform Accessibility Upgrades (2027)	555.3
Perform Facilities Refurbishments (2027)	1,470.2
Perform Minor Telecommunications Enhancements (2027)	157.1
Perform Software Upgrades and Minor Enhancements - Operational Technology (2027)	274.8
Procure Accommodations (2027) - Postville	732.5
Procurement of Lidar for Digitization of Transmission Lines (2027)	500.0
Purchase Mobile Devices (2027)	327.0
Purchase Personal Computers (2027)	1,649.6
Purchase Tools and Equipment (2027)	2,176.0
Replace Cisco Call Manager Appliances (2027)	213.5
Replace Light-Duty Mobile Equipment (2027)	1,542.0
Replace Peripheral Infrastructure (2027)	461.8
Stabilize Powerhouse Slope (2027) - Cat Arm	1,729.8
Telecommunications In-Service Failures (2027)	118.8
Update Cybersecurity Infrastructure (2027)	342.6
Upgrade Core Information Technology Infrastructure (2027)	2,909.4
Upgrade Core Operational Technology Infrastructure (2027)	561.2
General Plant Total	**18,730.1**
Mandatory	
Purchase Meters and Metering Equipment (2027)	737.6
Mandatory Total	**737.6**

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Single-Year Programs and Projects[1]
($000)

	2027
Renewal	
Combustion Turbine In-Service Failures (2027)	1,038.0
Diesel In-Service Failures (2027)	1,256.9
Distribution System In-Service Failures and Miscellaneous Upgrades (2027)	6,665.2
Hydraulic In-Service Failures (2027)	3,353.5
Overhaul Generator - Unit 3 (2027) - Holyrood	3,823.8
Overhaul Hydraulic Units (2027)	4,436.5
Overhaul Main Enclosure (2027) - Stephenville	975.4
Overhaul Major Pumps and Associated Motors (2027) - Holyrood	3,355.2
Overhaul Marine Terminal Loading Arms (2027) - Holyrood	831.1
Overhaul Turbine Valves - Unit 1 (2027) - Holyrood	7,973.1
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2027) - Holyrood	10,119.7
Perform Dam Infrastructure Refurbishments (2027)	526.3
Perform Level 2 Condition Assessment - Steel Section (2027) - Paradise River	174.0
Renew Diesel Units (2027)	3,642.0
Replace Rip Rap on LD-5 (2027) - Salmon River Spillway	719.6
Terminal Station In-Service Failures (2027)	2,203.3
Thermal In-Service Failures (2027)	3,836.4
Transmission In-Service Failures (2027)	194.5
Wood Pole Line Management (2027)	7,998.0
Renewal Total	**63,122.5**
Service Enhancement	
Remove Safety Hazards (2027)	310.8
Service Enhancement Total	**310.8**
System Growth	
Additions for Load Growth - Upgrade Fuel Storage (2027) - Cartwright	442.7
System Growth Total	**442.7**
Total Single-Year Programs and Projects	**90,160.4**

[1] Numbers may not add due to rounding.

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Multi-Year Programs and Projects[1]
($000)

	2026 and Prior Years	2027	2028	2029	2030	2031	Sum of Total With Prior Year
2025							
General Plant							
Replace Light- and Heavy-Duty Vehicles (2025-2027)	4,390.4	3,447.2	-	-	-	-	7,837.6
Replace Mobile Equipment (2025-2027)	2,028.2	3,202.3	-	-	-	-	5,230.5
Subtotal General Plant	**6,418.6**	**6,649.5**	**-**	**-**	**-**	**-**	**13,068.1**
Renewal							
Replace Diesel Gensets (2025-2027)	2,148.8	4,074.8	-	-	-	-	6,223.6
Replace Emergency Diesel Genset (2025-2027) - Cat Arm	1,487.3	-	-	-	-	-	1,487.3
Subtotal Renewal	**3,636.1**	**4,074.8**	**-**	**-**	**-**	**-**	**7,710.9**
Service Enhancement							
Upgrade Worst-Performing Distribution Feeders (2025-2027)	6,356.3	2,529.8	-	-	-	-	8,886.1
Subtotal Service Enhancement	**6,356.3**	**2,529.8**	**-**	**-**	**-**	**-**	**8,886.1**
2025 Total	**16,411.0**	**13,254.1**	**-**	**-**	**-**	**-**	**29,665.1**
2026							
Access							
Upgrade Distribution System (2026-2027) - Wiltondale	408.7	952.7	-	-	-	-	1,361.4
Subtotal Access	**408.7**	**952.7**	**-**	**-**	**-**	**-**	**1,361.4**
General Plant							
Perform Software Upgrades and Minor Enhancements - Information Technology (2026-2027)	649.9	1,097.2	-	-	-	-	1,747.1
Refurbish Meteorological Stations - Phase 2 (2026-2027)	528.1	167.4	-	-	-	-	695.5
Replace 48 V Battery Banks and Chargers (2026-2027)	250.1	524.4	-	-	-	-	774.5
Replace Back-up Generators at Microwave Repeater Sites (2026-2027)	94.5	391.3	-	-	-	-	485.8
Replace GRID Application (2026-2027)	134.9	363.9	-	-	-	-	498.8
Replace Heavy-Duty Mobile Equipment (2026-2028)	173.8	1,809.7	2,112.2	-	-	-	4,095.7
Replace Heavy-Duty Vehicles (2026-2028)	1,524.1	788.5	2,204.4	-	-	-	4,517.0
Replace Light-Duty Vehicles (2026-2027)	2,547.5	548.6	-	-	-	-	3,096.1
Replace Network Communications Equipment (2026-2027)	1,038.4	99.0	-	-	-	-	1,137.4
Replace Radio Link to Hydraulic Control Structure (2026-2027) - Ebbegunbaeg	470.5	756.8	-	-	-	-	1,227.3
Replace Teleprotection Equipment (2026-2028)	964.4	310.6	224.8	-	-	-	1,499.8
Replace Walkway to Toe of Dam (2026-2027) - Paradise River	16.8	566.1	-	-	-	-	582.9
Upgrade Core IT Infrastructure (2026-2027)	871.6	522.9	-	-	-	-	1,394.5
Subtotal General Plant	**9,264.7**	**7,946.3**	**4,541.4**	**-**	**-**	**-**	**21,752.4**
Mandatory							
Upgrade PLX Metering System (2026-2028) - Labrador East	1,188.8	485.8	494.3	-	-	-	2,168.9
Subtotal Mandatory	**1,188.8**	**485.8**	**494.3**	**-**	**-**	**-**	**2,168.9**
Renewal							
L23/24 Steel-Tower Transmission Line Renewal (2026-2029)	576.2	2,735.3	2,539.1	2,726.8	-	-	8,577.4
Perform Level 2 Condition Assessment - Condenser and Condenser Tubes (2026-2027) - Holyrood	577.3	51.7	-	-	-	-	629.0
Perform Major Inspection - Synchronous Condenser 1 (2026-2027) - Wabush Terminal Station	43.0	700.7	-	-	-	-	743.7
Refurbish Water Treatment Systems (2026-2027) - Holyrood	524.5	936.3	-	-	-	-	1,460.8
Renew Circuit Breakers (2026-2028)	188.2	2,250.1	1,975.6	-	-	-	4,413.9
Renew Distribution Feeders (2026-2027)	1,015.3	3,053.0	-	-	-	-	4,068.3
Replace 125VDC Battery Bank (2026-2027) - Hardwoods	108.9	37.8	-	-	-	-	146.7
Replace Air Dryer (2026-2027) - Hardwoods	75.2	198.0	-	-	-	-	273.2
Replace Battery Bank (2026-2027) - Granite Canal	138.8	44.2	-	-	-	-	183.0
Replace DC Fuel Pump (2026-2027) - Hardwoods	90.4	58.4	-	-	-	-	148.8
Replace Disconnects (2026-2028)	169.1	1,694.0	631.6	-	-	-	2,494.7
Replace Instrument Transformers (2026-2027)	371.2	196.1	-	-	-	-	567.3
Replace Parts of Stage 1: 129 Vdc Batteries and Battery Chargers (2026-2027) - Holyrood	229.1	100.1	-	-	-	-	329.2
Replace Protective Relays (2026-2027)	616.0	1,969.8	-	-	-	-	2,585.8
Replace Roof (2026-2027) - Hopedale	190.6	1,791.0	-	-	-	-	1,981.6
Replace Terminal Station Battery Banks and Chargers (2026-2027)	326.1	236.7	-	-	-	-	562.8
Upgrade Power Transformers (2026–2027)	1,705.0	401.8	-	-	-	-	2,106.8
Upgrade Spherical Valve Controls (2026-2029) - Bay d'Espoir	314.9	219.6	358.3	460.3	-	-	1,353.1
Subtotal Renewal	**7,259.8**	**16,674.6**	**5,504.6**	**3,187.1**	**-**	**-**	**32,626.1**
Service Enhancement							
Install Intelligent Electronic Devices Management Software (2026-2028)	297.2	675.4	297.6	-	-	-	1,270.2
Relocate Section of Line (2026-2028) - TL220	79.7	2,970.7	1,041.0	-	-	-	4,091.4
Replace Expansion Joint and Rock Scaling (2026-2027) - Paradise River	516.9	230.4	-	-	-	-	747.3
Upgrade Cooling (2026-2027) - Hardwoods	100.6	344.5	-	-	-	-	445.1
Upgrade Excitation System (2026-2027) - Paradise River	218.7	203.5	-	-	-	-	422.2
Upgrade Terminal Station for Mobile Substation (2026-2027) - St. Anthony Diesel	66.1	328.6	-	-	-	-	394.7
Upgrade Worst-Performing Distribution Feeders (2026-2027)	756.3	3,534.9	-	-	-	-	4,291.2
Subtotal Service Enhancement	**2,035.5**	**8,288.0**	**1,338.6**	**-**	**-**	**-**	**11,662.1**
2026 Total	**20,157.5**	**34,347.4**	**11,878.9**	**3,187.1**	**-**	**-**	**69,570.9**

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Multi-Year Programs and Projects[1]
($000)

	2026 and Prior Years	2027	2028	2029	2030	2031	Sum of Total With Prior Year
2027							
General Plant	-						
Construct Pole Storage Ramps (2027-2028) - Happy Valley	-	58.9	336.6	-	-	-	395.5
Install Electric Vehicle Chargers (2027-2028) - Hydro Sites	-	274.5	326.1	-	-	-	600.6
Install Fire Protection in 230 kV Stations (2027-2028) - Bottom Brook	-	73.8	578.3	-	-	-	652.1
Perform Software Upgrades and Minor Enhancements - Information Technology (2027-2028)	-	1,298.0	249.4	-	-	-	1,547.4
Refurbish Intake Access Road (2027-2028) - Bay d'Espoir	-	465.0	2,796.8	-	-	-	3,261.8
Replace 48 V Battery Banks and Chargers (2027-2028)	-	52.3	428.9	-	-	-	481.2
Replace Heavy-Duty Mobile Equipment (2027-2028)	-	1,996.2	579.3	-	-	-	2,575.5
Replace Heavy-Duty Vehicles (2027-2029)	-	835.4	1,303.3	1,309.2	-	-	3,447.9
Replace Light-Duty Vehicles (2027-2028)	-	3,125.9	701.6	-	-	-	3,827.5
Replace Network Communications Equipment (2027-2028)	-	624.6	63.6	-	-	-	688.2
Replace Power Line Carrier (2027-2029) - TL212	-	154.9	1,552.7	419.1	-	-	2,126.7
Replace Roof (2027-2028) - Cartwright	-	214.5	1,254.2	-	-	-	1,468.7
SWOP Replacement (2027-2028)	-	1,053.9	455.8	-	-	-	1,509.7
Upgrade Energy Management System (2027-2028)	-	375.9	385.8	-	-	-	761.7
Upgrade Line Depot (2027-2029) - Bay d'Espoir	-	470.6	1,811.7	3,918.4	-	-	6,200.7
Subtotal General Plant	**-**	**11,074.4**	**12,824.1**	**5,646.7**	**-**	**-**	**29,545.2**
Renewal	-						
Inspect Fuel Storage Tanks (2027-2028) - Makkovik	-	187.5	2,586.3	-	-	-	2,773.8
Install Breaker Failure Protection (2027-2028)	-	993.1	1,523.7	-	-	-	2,516.8
Perform Level 2 Condition Assessment - West Salmon Spillway (2027-2028) - Upper Salmon	-	639.5	29.6	-	-	-	669.1
Perform Major Inspection - Synchronous Condenser 2 (2027-2028) - Wabush Terminal Station	-	63.6	661.3	-	-	-	724.9
Refurbish Aluminum Towers (2027-2028) - TL212	-	165.7	2,591.3	-	-	-	2,757.0
Refurbish Draft Tube Deck - Phase 3 (2027-2029) - Bay d'Espoir	-	159.6	806.0	839.4	-	-	1,805.0
Refurbish MD-1 (2027-2030) - Ebbegunbaeg	-	665.8	1,919.1	3,312.4	5,137.5	-	11,034.8
Renew Circuit Breakers (2027-2029)	-	130.0	168.9	1,651.6	-	-	1,950.5
Renew Distribution Feeders (2027-2028)	-	242.9	2,432.7	-	-	-	2,675.6
Replace Annunciator Panel (2027-2028) Upper Salmon	-	141.3	242.9	-	-	-	384.2
Replace Circuit Breaker Reclosing Controllers (2027-2028) - Come by Chance	-	69.1	107.0	-	-	-	176.1
Replace Diesel Gensets (2027-2029)	-	224.9	258.5	2,308.1	-	-	2,791.5
Replace Diesel Gensets (2027–2029) - Burnt Dam Spillway	-	475.6	1,409.1	107.4	-	-	1,992.1
Replace Disconnects (2027-2029)	-	140.1	834.9	601.9	-	-	1,576.9
Replace Exciter Controller - SC1 and SC2 (2027-2028) - Wabush	-	467.3	200.4	-	-	-	667.7
Replace Hydraulic Lift Pump (2027-2028) - Burnt Dam	-	89.3	160.7	-	-	-	250.0
Replace Instrument Transformers (2027-2028)	-	72.0	365.3	-	-	-	437.3
Replace Protective Relays (2027-2028)	-	700.1	2,314.2	-	-	-	3,014.3
Replace T1 (2027-2029) - Burgeo	-	309.9	499.8	1,717.3	-	-	2,527.0
Replace Terminal Station Battery Banks and Chargers (2027-2028)	-	26.1	182.4	-	-	-	208.5
Upgrade Power Transformers (2027–2028)	-	518.1	766.2	-	-	-	1,284.3
Subtotal Renewal	**-**	**6,481.5**	**20,060.3**	**10,538.1**	**5,137.5**	**-**	**42,217.4**
Service Enhancement							
Distribution Equipment SCADA Additions - Phase I (2027-2028)	-	548.8	822.0	-	-	-	1,370.8
Upgrade Blackstart Diesel Instrumentation (2027-2028) - Holyrood	-	234.2	203.9	-	-	-	438.1
Upgrade Terminal Station for Mobile Substation (2027-2028) - Glenburnie	-	78.2	330.2	-	-	-	408.4
Upgrade Worst-Performing Distribution Feeders (2027–2028) – Fleur De Lys, Line 1	-	176.3	3,388.8	-	-	-	3,565.1
Subtotal Service Enhancement	**-**	**1,037.5**	**4,744.9**	**-**	**-**	**-**	**5,782.4**
2027 Total	**-**	**18,593.4**	**37,629.3**	**16,184.8**	**5,137.5**	**-**	**77,545.0**
Total Multi-Year Programs and Projects	**36,568.5**	**66,194.9**	**49,508.2**	**19,371.9**	**5,137.5**	**-**	**176,781.0**

[1] Numbers may not add due to rounding.

Appendix C

2027 Capital Budget by Materiality – Programs and Projects over $5 Million



Newfoundland and Labrador Hydro
2026 Capital Budget Application
By Materiality – Programs and Projects Over $5 Million[1]
($000)

	2026 and Prior Years	2027	Future Years	Total
Access				
Provide Service Extensions (2027)	-	5,816.7	-	5,816.7
Access Total	**-**	**5,816.7**	**-**	**5,816.7**
General Plant				
Replace Light- and Heavy-Duty Vehicles (2025-2027)	4,390.4	3,447.2	-	7,837.6
Replace Mobile Equipment (2025-2027)	2,028.2	3,202.3	-	5,230.5
Upgrade Line Depot (2027-2029) - Bay d'Espoir	-	470.6	5,730.1	6,200.7
General Plant Total	**6,418.6**	**7,120.1**	**5,730.1**	**19,268.8**
Renewal				
Distribution System In-Service Failures and Miscellaneous Upgrades (2027)	-	6,665.2	-	6,665.2
L23/24 Steel-Tower Transmission Line Renewal (2026-2029)	576.2	2,735.3	5,265.9	8,577.4
Overhaul Turbine Valves - Unit 1 (2027) - Holyrood	-	7,973.1	-	7,973.1
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2027) - Holyrood	-	10,119.7	-	10,119.7
Refurbish MD-1 (2027-2030) - Ebbegunbaeg	-	665.8	10,369.0	11,034.8
Replace Diesel Gensets (2025-2027)	2,148.8	4,074.8	-	6,223.6
Wood Pole Line Management (2027)	-	7,998.0	-	7,998.0
Renewal Total	**2,725.0**	**40,231.9**	**15,634.9**	**58,591.8**
Service Enhancement				
Upgrade Worst-Performing Distribution Feeders (2025-2027)	6,356.3	2,529.8	-	8,886.1
Service Enhancement Total	**6,356.3**	**2,529.8**	**-**	**8,886.1**
Total Programs and Projects Over $5 Million	**15,499.9**	**55,698.5**	**21,365.0**	**92,563.4**

[1] Numbers may not add due to rounding.

Appendix D

2027 Capital Budget by Materiality – Programs and Projects $1 Million to $5 Million



Newfoundland and Labrador Hydro
2026 Capital Budget Application
By Materiality – Programs and Projects $1 Million to $5 Million[1]
($000)

	2026 and Prior Years	2027	Future Years	Total
Access				
Upgrade Distribution System (2026-2027) - Wiltondale	408.7	952.7	-	1,361.4
Access Total	**408.7**	**952.7**	**-**	**1,361.4**
Allowance for Unforeseen				
Allowance for Unforeseen Items (2027)	-	1,000.0	-	1,000.0
Allowance for Unforeseen Total	**-**	**1,000.0**	**-**	**1,000.0**
General Plant				
Perform Facilities Refurbishments (2027)	-	1,470.2	-	1,470.2
Perform Software Upgrades and Minor Enhancements - Information Technology (2026-2027)	649.9	1,097.2	-	1,747.1
Perform Software Upgrades and Minor Enhancements - Information Technology (2027-2028)	-	1,298.0	249.4	1,547.4
Purchase Personal Computers (2027)	-	1,649.6	-	1,649.6
Purchase Tools and Equipment (2027)	-	2,176.0	-	2,176.0
Refurbish Intake Access Road (2027-2028) - Bay d'Espoir	-	465.0	2,796.8	3,261.8
Replace Heavy-Duty Mobile Equipment (2026-2028)	173.8	1,809.7	2,112.2	4,095.7
Replace Heavy-Duty Mobile Equipment (2027-2028)	-	1,996.2	579.3	2,575.5
Replace Heavy-Duty Vehicles (2026-2028)	1,524.1	788.5	2,204.4	4,517.0
Replace Heavy-Duty Vehicles (2027-2029)	-	835.4	2,612.5	3,447.9
Replace Light-Duty Mobile Equipment (2027)	-	1,542.0	-	1,542.0
Replace Light-Duty Vehicles (2026-2027)	2,547.5	548.6	-	3,096.1
Replace Light-Duty Vehicles (2027-2028)	-	3,125.9	701.6	3,827.5
Replace Network Communications Equipment (2026-2027)	1,038.4	99.0	-	1,137.4
Replace Power Line Carrier (2027-2029) - TL212	-	154.9	1,971.8	2,126.7
Replace Radio Link to Hydraulic Control Structure (2026-2027) - Ebbegunbaeg	470.5	756.8	-	1,227.3
Replace Roof (2027-2028) - Cartwright	-	214.5	1,254.2	1,468.7
Replace Teleprotection Equipment (2026-2028)	964.4	310.6	224.8	1,499.8
Stabilize Powerhouse Slope (2027) - Cat Arm	-	1,729.8	-	1,729.8
SWOP Replacement (2027-2028)	-	1,053.9	455.8	1,509.7
Upgrade Core Information Technology Infrastructure (2027)	-	2,909.4	-	2,909.4
Upgrade Core IT Infrastructure (2026-2027)	871.6	522.9	-	1,394.5
General Plant Total	**8,240.2**	**26,554.1**	**15,162.8**	**49,957.1**
Mandatory				
Upgrade PLX Metering System (2026-2028) - Labrador East	1,188.8	485.8	494.3	2,168.9
Mandatory Total	**1,188.8**	**485.8**	**494.3**	**2,168.9**
Renewal				
Combustion Turbine In-Service Failures (2027)	-	1,038.0	-	1,038.0
Diesel In-Service Failures (2027)	-	1,256.9	-	1,256.9
Hydraulic In-Service Failures (2027)	-	3,353.5	-	3,353.5
Inspect Fuel Storage Tanks (2027-2028) - Makkovik	-	187.5	2,586.3	2,773.8
Install Breaker Failure Protection (2027-2028)	-	993.1	1,523.7	2,516.8
Overhaul Generator - Unit 3 (2027) - Holyrood	-	3,823.8	-	3,823.8
Overhaul Hydraulic Units (2027)	-	4,436.5	-	4,436.5
Overhaul Major Pumps and Associated Motors (2027) - Holyrood	-	3,355.2	-	3,355.2
Refurbish Aluminum Towers (2027-2028) - TL212	-	165.7	2,591.3	2,757.0
Refurbish Draft Tube Deck - Phase 3 (2027-2029) - Bay d'Espoir	-	159.6	1,645.4	1,805.0
Refurbish Water Treatment Systems (2026-2027) - Holyrood	524.5	936.3	-	1,460.8
Renew Circuit Breakers (2026-2028)	188.2	2,250.1	1,975.6	4,413.9
Renew Circuit Breakers (2027-2029)	-	130.0	1,820.5	1,950.5
Renew Diesel Units (2027)	-	3,642.0	-	3,642.0
Renew Distribution Feeders (2026-2027)	1,015.3	3,053.0	-	4,068.3
Renew Distribution Feeders (2027-2028)	-	242.9	2,432.7	2,675.6
Replace Diesel Gensets (2027-2029)	-	224.9	2,566.6	2,791.5
Replace Diesel Gensets (2027–2029) - Burnt Dam Spillway	-	475.6	1,516.5	1,992.1
Replace Disconnects (2026-2028)	169.1	1,694.0	631.6	2,494.7
Replace Disconnects (2027-2029)	-	140.1	1,436.8	1,576.9
Replace Emergency Diesel Genset (2025-2027) - Cat Arm	1,487.3	-	-	1,487.3
Replace Protective Relays (2026-2027)	616.0	1,969.8	-	2,585.8
Replace Protective Relays (2027-2028)	-	700.1	2,314.2	3,014.3
Replace Roof (2026-2027) - Hopedale	190.6	1,791.0	-	1,981.6
Replace T1 (2027-2029) - Burgeo	-	309.9	2,217.1	2,527.0
Terminal Station In-Service Failures (2027)	-	2,203.3	-	2,203.3
Thermal In-Service Failures (2027)	-	3,836.4	-	3,836.4
Upgrade Power Transformers (2026–2027)	1,705.0	401.8	-	2,106.8
Upgrade Power Transformers (2027–2028)	-	518.1	766.2	1,284.3
Upgrade Spherical Valve Controls (2026-2029) - Bay d'Espoir	314.9	219.6	818.6	1,353.1
Renewal Total	**6,210.9**	**43,508.7**	**26,843.1**	**76,562.7**

Newfoundland and Labrador Hydro
2026 Capital Budget Application
By Materiality – Programs and Projects $1 Million to $5 Million[1]
($000)

	2026 and Prior Years	2027	Future Years	Total
Service Enhancement				
Distribution Equipment SCADA Additions - Phase I (2027-2028)	-	548.8	822.0	1,370.8
Install Intelligent Electronic Devices Management Software (2026-2028)	297.2	675.4	297.6	1,270.2
Relocate Section of Line (2026-2028) - TL220	79.7	2,970.7	1,041.0	4,091.4
Upgrade Worst-Performing Distribution Feeders (2026-2027)	756.3	3,534.9	-	4,291.2
Upgrade Worst-Performing Distribution Feeders (2027–2028)	-	176.3	3,388.8	3,565.1
Service Enhancement Total	**1,133.2**	**7,906.1**	**5,549.4**	**14,588.7**
Total Programs and Projects $1 Million to $5 Million	**17,181.8**	**80,407.4**	**48,049.6**	**145,638.8**

[1] Numbers may not add due to rounding.

Appendix E

2027 Capital Budget by Materiality – Programs and Projects $750,000 to $1 Million



Newfoundland and Labrador Hydro
2027 Capital Budget Application
By Materiality – Programs and Projects $750,000 to $1 Million[1]
($000)

	2026 and Prior Years	2027	Future Years	Total
General Plant				
Migrate Legacy Applications (2027)	-	988.2	-	988.2
Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2027)	-	992.4	-	992.4
Replace 48 V Battery Banks and Chargers (2026-2027)	250.1	524.4	-	774.5
Upgrade Energy Management System (2027-2028)	-	375.9	385.8	761.7
General Plant Total	**250.1**	**2,880.9**	**385.8**	**3,516.8**
Renewal				
Overhaul Main Enclosure (2027) - Stephenville	-	975.4	-	975.4
Overhaul Marine Terminal Loading Arms (2027) - Holyrood	-	831.1	-	831.1
Renewal Total	**-**	**1,806.5**	**-**	**1,806.5**
Total Programs and Projects $750,000 to $1 Million	**250.1**	**4,687.4**	**385.8**	**5,323.3**

[1] Numbers may not add due to rounding.

Appendix F

Terminal Station Asset Management Strategy – 2026 Update



Terminal Station
Asset Management Strategy

2026 Update



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1.0 Introduction

Newfoundland and Labrador Hydro's ("Hydro") Terminal Station Asset Management Strategy describes Hydro's Terminal Station Asset Management System and programs for planned capital work (i.e., replacements and upgrades) on terminal station infrastructure.

Hydro's Terminal Station Asset Management System governs the life cycle of its terminal station assets. This system monitors, maintains, refurbishes, replaces, and disposes of assets to provide safe, reliable electrical power in an environmentally responsible manner at the lowest possible cost. This system allows the asset managers to establish consistent practices for equipment specifications, placement, maintenance, refurbishment, replacement, and disposal for terminal station assets, such as breakers, transformers, grounding systems, buildings, and sites. These practices ensure consistency in the monitoring, assessments, and action justifications for asset-sustaining projects' capital refurbishment and replacement. Hydro established programs that enact these practices for groupings or sub-groupings of assets (e.g., high-voltage switch replacements).

This report provides information as to the assets involved and an overview of each asset program. It is divided into sections, each of which describes an infrastructure asset class, including the high-level function and/or construction of the equipment in that asset class and the associated capital program, including eligibility criteria (a combination of age, usage, condition, and reliability improvement). Hydro will provide an update to its Terminal Station Asset Management Strategy in its annual capital budget applications.

2.0 Background

2.1 Hydro's Terminal Stations

Hydro has 69 terminal stations throughout Newfoundland and Labrador. Terminal stations play a critical role in the transmission and distribution of electricity. Terminal stations contain electrical equipment, such as transformers, circuit breakers, instrument transformers, disconnect switches, and associated protection and control relays and equipment required to protect, control, and operate Hydro's electrical grid. Terminal stations act as transition points within the transmission system and interface points with the lower voltage distribution and generation systems.

2.2 Terminal Station Infrastructure

Terminal stations contain the following infrastructure, which is described throughout this report:

- Transformers;
- Circuit breakers;
- Instrument transformers;
- Disconnect, bypass, and ground switches;
- Surge arresters;
- Grounding;
- Buswork;
- Steel structures and foundations;
- Insulators;
- Control buildings;
- Protection and control relays;
- Yards, fences, and access roads;
- Battery banks;
- Lighting; and
- Synchronous condensers.

Many of Hydro's terminal stations were constructed in the 1960s. Annual capital commitment is needed to sustain terminal station assets to ensure that Hydro can continue to provide customers with reliable electrical service.

3.0 Asset Management Programs

3.1 Electrical Equipment

3.1.1 High-Voltage Instrument Transformer Replacements

3.1.1.1 Introduction

Protection, control, and metering devices, such as protective relaying, power quality monitors, and kilowatt-hour meters used in generation and transmission systems, are not manufactured to handle the currents and voltages inherent to those systems. Measurement of the electricity's currents and voltages are provided to these devices through a current transformer and a potential transformer, respectively (Figure 1), known collectively as instrument transformers.

A high-voltage instrument transformer consists of insulated electrical primary and secondary winding, a tank, and bushing components. The insulation system involves the use of insulating oil- or dry-type insulation and a high-voltage porcelain bushing that allows the safe connection of the winding, which is enclosed in a steel tank, to high-voltage conductors. Hydro has approximately 900 individual high-voltage instrument transformers within the Island and Labrador Interconnected Systems.



Figure 1: 69 kV Current Transformer (left) and Potential Transformer (right)

3.1.1.2 Program Description and Justification

Hydro manages its planned budgeted instrument transformer replacements in four categories:

1) Condition;

2) Age;

3) Additions for protective relay upgrades; and

4) Exclusions.

Condition

Deterioration or damage to the various instrument transformer components can result in the failure of the unit to provide accurate measurements to metering, protection, and control devices, which may affect the safe and reliable operation of the generation and transmission systems. Failure could also result in an oil spill. In some situations, pieces of the instrument transformer may be forcibly projected, resulting in a safety risk for personnel in the area or damage to other infrastructure.

Damage to an instrument transformer normally results from vandalism, impacts from catastrophically failed equipment, or accidental contact with mobile equipment. Upon such incidents, Hydro assesses the electrical and physical integrity of the instrument transformer to determine if replacement is required.

Hydro monitors instrument transformers for physical and electrical deterioration by conducting regular visual inspections of the units as part of its Terminal Station Inspection Program as well as regularly scheduled terminal station infrared inspections and electrical insulation testing.

Physical deterioration involves conditions such as oil leaks, rusting, or small chips and cracks in the insulation. An example of rusting on a potential transformer tank is provided as Figure 2.



Figure 2: Rusting Potential Transformer

Electrical deterioration is identified by conducting power factor testing at intervals that are used to establish the rate and level of insulation degradation. Hydro uses Doble Engineering Company to assist with the assessment of the test results, where required. Hydro's asset management personnel continuously review the unit deterioration information and determine when corrective maintenance or unit replacement is required.

Hydro conducts minor corrective maintenance on its instrument transformers, such as painting and small bushing chip treatment. As external services to economically undertake major corrective maintenance or unit refurbishments are non-existent, units requiring major corrective maintenance or refurbishments are replaced.

Age

To reduce the risk of in-service failures and minimize service interruptions, Hydro targets the replacement of instrument transformers at 40 years. According to original equipment manufacturers, the recommended life of an instrument transformer is approximately 30 to 40 years. From 2018–2025, 43% of failed instrument transformers were at least 30 years old at the time of failure.

Additions for Protective Relay Upgrade

Some protective relay upgrades require one or more additional instrument transformers for the upgrade to conform to Hydro's Protection and Control Engineering Standards. The installation of these additional instrument transformers is typically coordinated with the associated protective relay upgrade such that both the protective relay upgrade and the additional instrument transformer(s) are installed at the same time.

Exclusions

Modern-day circuit breaker technology has current transformers embedded in the circuit breaker bushings. As a result, where possible, external current transformers will be displaced by bushing current transformers as circuit breakers are replaced; therefore, current transformers are not included in this program.

3.1.2 High-Voltage Switch Replacements

3.1.2.1 Introduction

High-voltage switches are used to isolate equipment for maintenance activities or for system operation and control (disconnect switches). Switches are also used to bypass equipment to prevent customer outages while work is being performed on the equipment. Disconnect switches are an important part of Hydro's "Work Protection Code Book,"[1] as they provide a visible air gap (i.e., visible isolation) for utility workers. Proper operation of disconnect switches is essential for a safe work environment and reliable operation.

The basic components of a disconnect switch are the blade assembly, insulators, switch base, and operating mechanism. The blade assembly is the current-carrying component in the switch, and the operating mechanism moves it to open and close the switch. Insulators are made of porcelain and insulate the switch base and operating mechanism from the current-carrying components. The switch base is mounted to a metal frame support structure and supports the insulators. The operating mechanism is operated either manually (by using a handle at ground level to open and close the blade) or by a motor-operated device (in which case the switch is known as a motor-operated disconnect). A disconnect and its associated components are shown in Figure 3.

[1] As per "Work Protection Code Book," Newfoundland and Labrador Hydro, 2020, p. 12,
"A Work Protection is a guarantee;

- that an isolated, or isolated and de-energized condition has been established for work, and
- will continue to exist, except for authorized test."

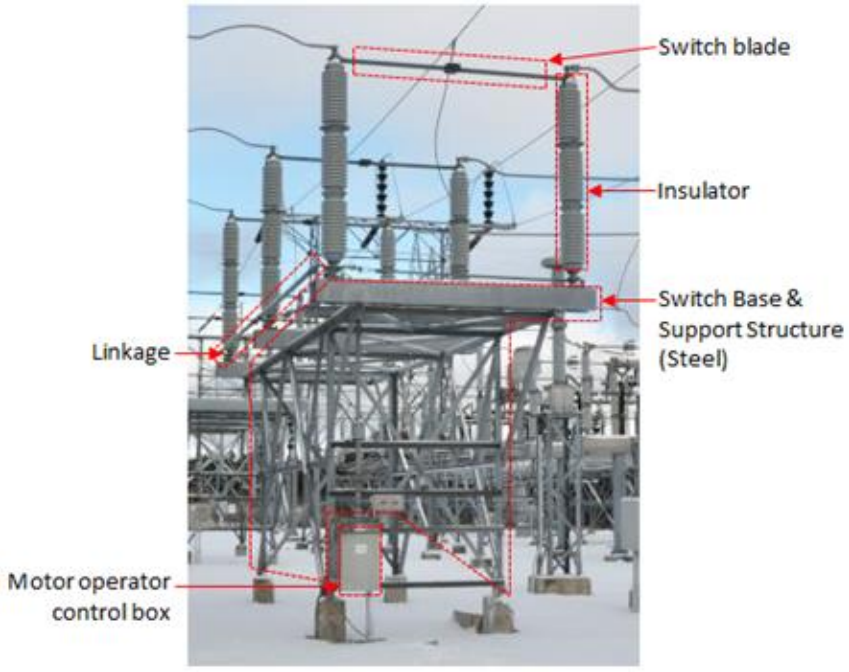


Figure 3: Various Components of a High-Voltage Disconnect Switch

Hydro monitors the condition of its switches by conducting regular visual inspections of the units as part of its Terminal Station and Infrared Inspection Programs and by reviewing reports from the JDE E1 work order system or staff who operate the switch. These reports outline problems such as inoperable mechanical linkages, misalignment of switch blades, broken insulators, and the seizing of moving parts. Asset management personnel determine the timing of corrective maintenance or switch replacement. If the required parts are available, repairs are undertaken as part of ongoing maintenance. Switches that meet any of the following criteria are eligible for replacement and are typically planned for replacement within 5 years of eligibility:

- Replacement parts are unavailable due to obsolescence, damage beyond repair, or cost-prohibitive repair, and no immediate replacement is required due to failure; or
- Operating deficiencies and reached a service life of:
  - 50 years if insulators and live parts are original;
  - 60 years if insulators or live parts (but not both) are original;
  - 65 years of age if neither insulators nor live parts are original;
- Reached a service life of:
  - 60 years if its insulators and live parts are original; and
  - 70 years if its insulators and/or live parts are not original.

Figure 4 shows an example of a badly damaged disconnect switch.

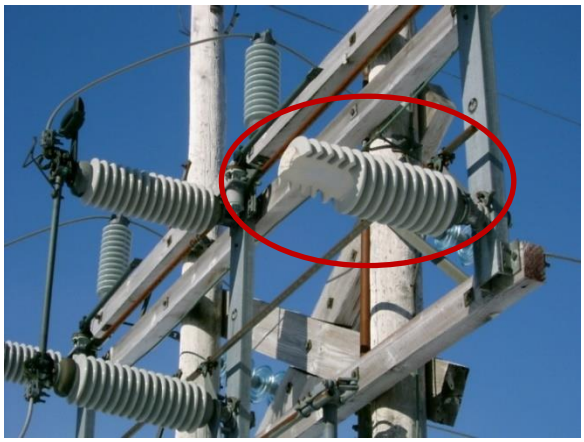


Figure 4: Broken Insulator on 69 kV Disconnect Switch

3.1.3 Surge Arrester Replacement

Surge arresters (also known as lightning arresters) are used on critical terminal station equipment to protect that equipment from voltage due to lightning, extreme system operating voltages, and switching transients, collectively called “overvoltages.” In these situations, voltage at the equipment can rise to levels that could damage the equipment’s insulation. The surge arresters act to maintain the voltages within acceptable levels. Without surge arresters, equipment insulation could be damaged, and faults could result during overvoltages. Hydro typically has surge arresters installed on the high-voltage and low-voltage sides of power transformers rated 46 kV and above.

Figure 5 shows the arresters on a 230 kV power transformer.



Figure 5: Western Avalon Terminal Station Transformer T3 230 kV Surge Arresters

Surge arresters can fail because of the cumulative effects of prolonged or multiple overvoltages. When a surge arrester fails, it is not repairable and must be replaced immediately; otherwise, the major equipment may be exposed to damaging overvoltages. Older arrester designs have a higher incidence of failure than the newer designs.

Hydro's Surge Arrester Asset Management Program replaces surge arresters based on the following criteria:

- Removal of gapped-type arresters with zinc oxide design due to enhanced performance;
- Replacement of units due to a condition identified through visual inspections for chips or cracks or through electrical testing, such as power factor testing;
- If failures occur on a given transformer, all arresters on both the high and low side are considered for replacement either immediately or in a planned fashion; and
- If transformers are being planned for maintenance or other capital work, consideration is given to changing aged arresters on a common outage. To reduce the risk of in-service failures and minimize service interruptions, Hydro targets replacement at 40 years of age.

3.1.4 Insulator Replacement

Insulators provide electrical insulation between energized equipment and ground. When an insulator fails and a fault occurs, a safety hazard and/or customer outage(s) may occur.

Insulators consist of insulating material, such as glass and porcelain, and metallic end fittings to attach the insulator to the structure and the conductor. The metallic hardware is mated with the porcelain or glass insulator using cement. There are different styles of insulators; an example of a station post insulator is shown in Figure 6.

Terminal stations contain post-type, cap and pin-top type, multi-cone type, and suspension-type insulators.

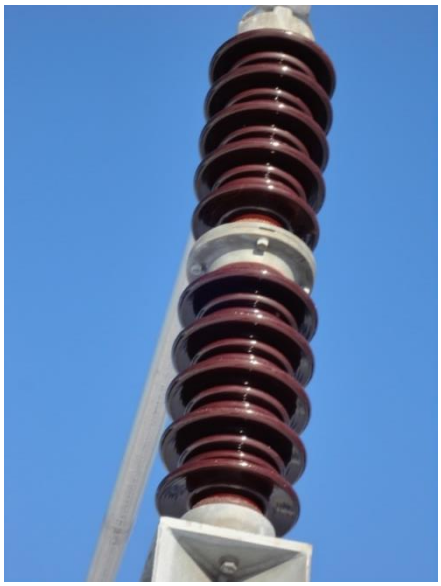


Figure 6: Multi-Cone Type Insulator Prone to Failure due to Cement Growth

For insulators using porcelain, cement is used in mating the porcelain and metallic hardware. Some older insulators have been damaged by a phenomenon known as cement growth, a common problem in the utility industry. In such situations, water is absorbed into the concrete during freeze/thaw cycles, causing swelling of the cement, thereby placing stress upon the porcelain. Over time, the increasing pressure caused by cement growth will crack or break the porcelain, resulting in insulator failure. In such situations, this porcelain may fall, presenting a safety hazard to crews or damaging equipment below. In addition, faults resulting in outages to customers often occur when insulator failure leads to flashover. To eliminate this problem, insulator manufacturers have identified and researched cement growth problems and improved cement quality.

Hydro carries out detailed insulator surveys by geographical area, identifying any known insulator types prone to failure due to cement growth and replacing these insulators as part of this program.

3.1.5 Grounding Refurbishment and Upgrades

The grounding system in a terminal station or distribution substation consists of copper wire used in the ground grid under the station, gradient control mats for high-voltage switches, and bonding wiring connecting the structure and equipment metal components to the ground grid, an example of which is shown as Figure 7. In the event of a ground fault, electrical potential differences will exist in the grounding system. If the grounding system is inadequate or deteriorated, these differences, known as

step and touch potentials, may be hazardous to personnel. Effective station grounding reduces these potentials to eliminate the hazard.



Figure 7: Typical Grounding Connection on Terminal Station Fence

To determine whether grounding upgrades are required, Hydro performs a step and touch potential analysis of the terminal station or distribution substation. Step and touch potential analysis involves the gathering of field data and conducting an analysis to determine if ground grid modifications are required to eliminate step and touch potential hazard. This engineering is conducted in accordance with the IEEE Standard 80-2000.[2] Grounding systems with hazardous step and/or touch potentials are upgraded by adding additional equipment bonding, gradient control mats, or copper wire to the station grounding grid. In the case where the terminal station grounding infrastructure has deteriorated with age or is damaged due to accidental contact or vandalism, the grounding system is refurbished by repairing damage or replacing missing infrastructure. Upgrades and refurbishments are made in accordance with Hydro's Terminal Station Grounding Standard.

3.1.6 Power Transformer Upgrades and Refurbishment

3.1.6.1 Introduction

Power transformers are a critical component of the power system. Transformers allow the cost-effective production, transmission, and distribution of electricity by converting the electricity to an appropriate voltage for each segment of the electrical system and allow for economic construction and operation of the electrical system.

[2] Institute of Electrical and Electronics Engineers. (2000). 80-2000, *IEEE Guide for Safety in AC Substation Grounding*.

Hydro has 118 power transformers and three oil-filled shunt reactors 46 kV and above, as well as several station service transformers at voltages lower than 46 kV.

The basic components of a power transformer are:

- A transformer steel tank containing the metal core and paper-insulated windings, oil (which is part of the insulating system), and a gasket system (which keeps the oil from getting into the environment);
- Bushings mounted to the top of the transformer tank (which connect the windings to the external electrical conductors);
- Radiators and cooling fans (which remove heat for the transformer's internal components);
- On-Load Tap Changer (which is a device attached internally or externally through which transformer voltages are maintained at acceptable levels); and
- Protective devices to ensure the safe operation of the transformer, such as gas detector relays, oil level and temperature relays, and gauges.

A 75 MVA, 230/66 kV power transformer at the Hardwoods Terminal Station is provided as Figure 8.



Figure 8: Power Transformer

3.1.6.2 Program Description and Justification

Transformers are expensive components of the electrical system. Similar to many North American utilities, Hydro is working to maximize and extend the life of its transformers by regularly assessing their condition, executing regularly scheduled maintenance and testing, and undertaking refurbishment or corrective actions, as required. Transformers regularly undergo visual inspection as part of Hydro's Terminal Station Inspection Program and scheduled preventive maintenance and testing to identify concerns regarding the following transformer conditions:

- Insulating oil and paper deterioration;
- Oil moisture content;
- Oil leaks;
- Tank, radiators, and other component rusting/corrosion;
- Tap changer component wear or damage;
- Damaged/deteriorated bushings;
- Failure of the protective devices; and
- Cooling fan failures.

Details on the assessment procedures and corrective action for each of these concerns are provided herein.

Transformer Oil Deterioration

The insulating oil in a transformer and its tap changer diverter switch is a critical component of the insulation system. Normal operation of a transformer will cause its oil to deteriorate. Deterioration results from several causes such as heating, internal arcing of electrical components, or ingress of water moisture into the transformer. Deterioration of the oil will affect its function in the insulation system and may damage its paper component. Unacceptable levels of deterioration can affect the reliable operation of the transformer. To ensure the oil in a transformer is of an acceptable quality, Hydro has an Oil Monitoring Program, in which an oil sample is obtained annually from each transformer and analyzed by a professional laboratory to determine the level of deterioration. If an unacceptable level of deterioration is present, required corrective action is identified by asset management personnel. This action entails either the refurbishment of the oil to improve its quality, or the replacement of the oil. Oil

that is PCB-contaminated (i.e., >2 ppm PCB) and whose refurbishment requires oil reclamation will be replaced.

Moisture Content

Oil samples are also analyzed to determine their moisture content. Moisture in a power transformer may be residual moisture or may result from the ingress of atmospheric moisture. Oil and insulating paper with high moisture content has a reduced dielectric strength, and therefore its performance as an electrical insulator is diminished. To address transformers with high moisture content, Hydro will either install an online molecular sieve dry-out system (which circulates and dries the transformer oil without requiring an equipment outage) or perform a hot oil dry-out (which circulates and dries the transformer oil and requires an equipment outage).

Oil Leaks and Corrosion

Transformer oil leaks are an environmental hazard. As oil is part of the insulation system, unchecked leaks can affect the safe and reliable operation of a transformer. Leaks can be caused by a number of factors, including failed gaskets or severe corrosion of radiators, tank piping, and other steel components. Transformers are visually inspected for leaks as part of the regularly scheduled Terminal Station Inspection Program and assessed by asset management personnel to determine the level of corrective action. Minor action (such as small repairs, patching, and minor painting) is undertaken as part of maintenance. Work requiring major refurbishments and replacements (such as radiator or bushing replacements, gasket replacements, and tank rusting refurbishment) are undertaken under this program.

On-Load Tap Changer

On-load tap changer diverter switches, which are externally mounted on the tank, adjust the voltage by changing the electrical connection point of the transformer winding. This involves moving parts that are subject to wear and damage. Additionally, in older, non-vacuum-designed diverter switches, arcing occurs during the movement, leading to deterioration of the insulating oil. This wear and deterioration can lead to failure of the tap changer. Oil testing techniques have been developed by professional laboratories that provide assessments of the condition of the parts and oil. Oil samples are obtained annually from each on-load tap changer to perform a Tap Changer Activity Signature Analysis. This analysis provides a condition assessment of the tap changer oil and components. Hydro typically implements the laboratory's sampling interval recommendations. This ranges from continued or

increased annual sampling, planned refurbishment, immediate removal from service, inspection, and repair. The latter two activities are covered by this project. Another component covered by this project is the correction of leaking seals between tap changer diverter switches and the transformer main tank. Currently, Hydro has several transformers that show low levels of combustible gases (such as acetylene), due to gasses migrating from the tap changer diverter switch compartment to the main tank.

Bushings

In addition to the aforementioned leaking bushings, Hydro must also address bushings with degraded electrical properties. As part of transformer preventive maintenance, Hydro performs power factor testing on bushings every six years. When power factor test results indicate unacceptable electrical degradation, bushings are scheduled for replacement.

Protective Devices and Cooling Fans

Protective devices and cooling fans are tested during visual inspections and preventive maintenance; they are replaced when they fail to operate as designed or their condition warrants replacement. In addition, cooling fans are added where additional cooling is required due to increased loads.

Online Oil Analysis

In addition to oil quality, dissolved gas analysis ("DGA") is performed on oil. DGA analyzes the levels of dissolved gases in oil, which provides insight into the condition of the transformer insulation. The presence of gases can indicate if the transformer has been subjected to fault conditions or overheating or if there is internal arcing or partial discharge occurring in the windings. The annual oil sample test can only provide an analysis of transformer condition at the time when the sample is taken. In 2015, as part of this program, Hydro began installing online dissolved gas monitoring on generator step-up ("GSU") transformers, to allow real-time, continuous monitoring of dissolved gases in oil. This continuously monitors the transformer and provides early fault detection. Continuous data is also a useful tool for personnel to use to trend gases to help schedule repairs or replacements before in-service failures, improving the overall reliability of the Island Interconnected System. Continuous monitoring enables Hydro to reduce unplanned outages and lessen the probability of equipment in-service failure.

This program was extended to non-GSU transformers in 2017, with online DGA being installed on critical power transformers on the Island Interconnected System. The factors used to determine the criticality

score were submitted to the Board of Commissioners of Public Utilities ("Board") on June 2, 2014.[3] Hydro has identified 49 transformers for installation of online DGA devices between 2019 and 2027.

3.1.7 Circuit Breaker Refurbishment and Replacements

The circuit breaker is a critical component of the power system. Located in a terminal station, each circuit breaker performs switching actions to complete, maintain, and interrupt current flow under normal or fault conditions. The reliable operation of circuit breakers through its fast response and complete interruption of current flow is essential for the protection and stability of the power system. The failure of a breaker to operate as designed may affect the reliability and safety of the electrical system, resulting in the failure of other equipment and the occurrence of an outage affecting more end users. Hydro has over 230 terminal station circuit breakers in service with a voltage rating of 46 kV or greater.

Currently, Hydro maintains two different types of high-voltage circuit breakers, examples of which are provided in Figure 9.

1) Oil Circuit Breakers ("OCB"): Use oil to interrupt currents. OCBs rated at 66 kV and above are planned for replacement after 40 years of service. However, as they come due, a further condition assessment will be completed to determine if life extension can be achieved through refurbishment.

2) Sulphur Hexafluoride ("SF_6") Circuit Breakers: Use SF_6 gas to interrupt current. The installation of these breakers started in 1979 and continues for all new installations. categorizes its high-voltage circuit switchers, all six of which are SF_6, as SF_6 circuit breakers for the purposes of refurbishment and replacement. A high-voltage circuit switcher is a device having most, but not all, of the functionality of both a high-voltage circuit breaker and a high-voltage disconnect switch.

[3] "Report to the Board of Commissioners of Public Utilities Regarding Work to be Performed on Transformers," Newfoundland and Labrador Hydro, June 2, 2014.



Figure 9: Oil Circuit Breakers (Right) and SF_6 Circuit Breakers (Left)

As presented in the 2016 CBA, SF_6 circuit breakers rated at 138 kV and above require refurbishment after 20 years of service. In 2018, Hydro added that 66 kV-rated breakers also require refurbishment after 20 years. Replacement of SF_6 circuit breakers rated at 66 kV and above will be planned after 40 years of service; however, as SF_6 circuit breakers come due, a further condition assessment will be completed to determine if life extension can be achieved through refurbishment. Some SF_6 circuit breakers may require replacement before the 40-year service life period based on their condition and operational history.

Circuit breakers that are an obsolete model will be planned for replacement after 40 years of service. The meaning of "obsolete" here is that either replacement parts and/or on-site servicing are no longer available from the manufacturer of the model.

SF6-free circuit breakers with vacuum interrupters whose rated voltage is 72.5kV are acceptable to Hydro for installation. The procurement of such a circuit breaker is acceptable to Hydro (as specified in NL Hydro's Terminals Engineering Standard TS09-001).

3.1.8 Station Service Refurbishment and Upgrades

The power required to operate various terminal stations and distribution substations, collectively referred to as "station" equipment and infrastructure, is provided by the Station Service System. The Station Service System provides alternating current ("AC") and direct current ("DC") power to operate the equipment in a station.

The AC station service is generally supplied by one or more transformers in the station. Due to their criticality, 230 kV terminal stations have a redundant station service feed, fed either through a redundant transformer tertiary (supplied from Newfoundland Power Inc.'s electrical system where available) or by a diesel generator. Common AC station service loads are:

- Transformer cooling fans;
- Anti-condensation heaters;
- Station lighting;
- Control building HVAC;[4]
- Control building lighting;
- Air compressors; and
- Battery chargers.

The DC station service is supplied by a battery bank that is charged from the AC station service. The DC station service provides power to critical devices in the station and is designed to allow operation of the station in the event of an AC station service failure. Hydro's DC station service system is a 125 V system in the majority of the stations, with some lower voltage stations and telecommunications equipment having 48 V systems. Common DC station service loads are:

- Circuit breaker trip and close circuits and charging motors;
- Protection relays;
- Emergency lighting;
- Disconnect switch motor operators for local/remote operation; and
- Telecommunications equipment.

As terminal station equipment is replaced, added, or upgraded, the AC and DC station service loads may increase. Upon the installation of new equipment in the terminal station, Hydro carries out a station service study to determine the loading on the station service system. If the new station service loads exceed the design load of the system, upgrades (such as cable, circuit breaker panel, splitter, and

[4] Heating, Ventilation, and Air-Conditioning ("HVAC").

transfer switch replacements) or additions are required. Replacement of station service transformers is not included in this program, as they are addressed separately in the CBA under the Upgrade Power Transformers project, if required.

3.1.9 Battery Banks and Chargers

3.1.9.1 Introduction

Battery banks and their chargers supply DC power to critical station infrastructure such as circuit breakers, protection and control relays, disconnect switch motor operators, and telecontrol equipment. Battery banks are designed to provide a minimum of eight hours of auxiliary power to critical infrastructure in the event of a loss of AC station service supply. The majority of Hydro's battery banks consist of lead-acid flooded-cell type batteries, whose capacity deteriorates over time. An example of a 125 VDC[5] terminal station battery bank is provided as Figure 10.

3.1.9.2 Program Description and Justification

Currently, Hydro completes discharge testing on criticality A and B battery banks after 10 years, then every 5 years for flooded cell, and every 2 years for valve regulated. Replacements will be planned if the battery bank's capacity has fallen to 80% or less of its rated capacity. Due to the critical nature of battery banks, flooded cell batteries are replaced after 20 years, valve-regulated lead-acid batteries are replaced after 10 years, and battery chargers are replaced after 20 years.



Figure 10: 125 VDC Terminal Station Battery Bank

[5] Volts Direct Current ("VDC").

3.1.10 Install Breaker Bypass Switches

High-voltage circuit breakers, with their associated protection and control equipment, are used to control the flow of electrical current to ensure safe and reliable operation of the electrical system. When a breaker is removed from service for maintenance, troubleshooting, refurbishment, or replacement, an alternate electrical path must be implemented to avoid customer outages. On radial systems,[6] this alternate path is accomplished using a bypass switch (Please refer to Figure 11). When closed, the bypass switch allows electricity to flow around the breaker, allowing the breaker to be safely de-energized, while maintaining service continuity.

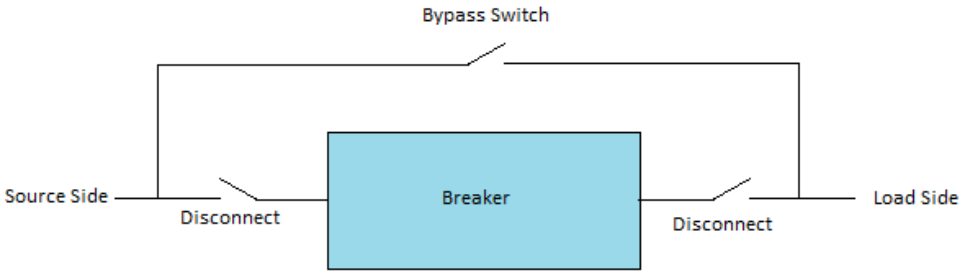


Figure 11: Example of Bypass Switch Installation

Table 1 lists the five radial systems, servicing multiple customers, where breakers are installed without bypass switches. To ensure service continuity during breaker downtime, Hydro is considering the installation of a breaker bypass for those listed in Table 1.

Table 1: Circuit Breakers without Bypass Switches

Location	Customers Affected
Bottom Waters L60T1	2,253 Bottom Waters area customers
Buchans B2T1	665 Buchans area Newfoundland Power customers and Duck Pond Mine
Howley B1T2	773 Hampden and Jackson's Arm area customers 665 Newfoundland Power Howley area customers
Peter's Barren B1L41	1,900 Great Northern Peninsula customers north of Daniel's Harbor
South Brook L22T1	2,340 South Brook area customers

In 2018, Hydro put a hold on this program and is looking at only doing this work when other major terminal station work is planned or if there is a low-cost solution. Doyles B1L15 had a low-cost bypass

[6] A radial system is an electrical network that has only one electrical path between the source and the load.

installed in the first quarter of 2020 through an In-Service Failure project to facilitate the topping up of an ongoing leak in breaker B1L15.

3.1.11 Replace Station Lighting

Terminal station lighting is essential to provide adequate illumination for a safe working environment and to deter theft and vandalism in terminal stations. Hydro utilizes a variety of lighting technologies and configurations, depending on the application and vintage of the lighting system. Over time, exposure to the elements can cause physical deterioration, such as corrosion (Please refer to Figure 12 and Figure 13), leading to moisture ingress, which impacts the function of the lighting system. In addition, some legacy lighting technologies have become obsolete.

Under this program, Hydro will replace deteriorated lighting systems as they become unable to provide adequate illumination of the terminal station and have become obsolete or beyond repair. Hydro will replace legacy lighting systems with modern, efficient lighting technologies whenever possible.



Figure 12: Corroded Ballast Requiring Replacement



Figure 13: Light Fixture Showing Perforations due to Corrosion, Enabling Moisture Ingress

3.1.12 Synchronous Condensers

Hydro maintains two dedicated synchronous condensers located at the Wabush Terminal Station. Each synchronous condenser undergoes major and minor inspections on a three-year rotating cycle, with minor inspections performed in both year one and year two of the cycle and a major inspection performed in year three. Each involves a standard list of checks, tests, and general maintenance as well as any additional items that have been identified for follow-up based on the results of previous inspections.

The minor inspections involve function testing, vibration checks, lube oil system maintenance, oil sampling, disassembly and inspection of the top half of bearings, clearance checks, electrical tests, visual inspections, cleaning, and general maintenance (including replacement of various gaskets, filters and hardware).

The major inspections expand on the same activities performed under the minor inspections by adding rotor and stator inspection, disassembly and inspection of the bottom half of the bearings, and replacement of the thrust bearings. A reduced-scope major inspection excluding some of this scope is named a modified major inspection by Hydro. Modified major inspections exclude the rotor and stator inspection and, by doing so, substantially reduce the cost of the inspection (by avoiding the physical removal & subsequent reinstallation of the rotor). Hydro's default cycle for a modified major inspection is once every six years (i.e., alternating between a regular major inspection and a modified major inspection), but this default cycle is subject to change based on the findings from a regular major and/or minor inspection completed since the last modified major inspection.

3.2 Civil Works and Buildings

3.2.1 Equipment Foundations

Reinforced concrete foundations support high-voltage equipment and structures in Hydro's terminal stations. The majority of these structures formed part of the original station construction and support critical terminal station equipment and buswork.

The service life of galvanized steel structures varies depending on the operating environment but can exceed 100 years, outliving the foundations on which they are built. A number of the foundations in Hydro terminal stations have deteriorated significantly due to repeated exposure to damaging freeze/thaw cycles, weathering, and age, leading to concerns over their integrity. Examples of degraded structure foundations are shown in Figure 14 and Figure 15.



Figure 14: Structure B1T1 Bottom Brook Terminal Station



Figure 15: Structure L01L37-1 Western Avalon Terminal Station

To ensure foundations perform as per the original design intent, severely deteriorated concrete foundations must be refurbished or replaced. Failure to complete repairs could result in a catastrophic failure, causing outages or personal injury. Hydro has carried out engineering inspections of all 230 kV stations and identified foundations requiring repairs. Hydro also performs visual inspections of foundations every 120 days during regular terminal station inspections. Foundations identified for repair are addressed under this program.

3.2.2 Fire Protection

Hydro's terminal station control buildings contain combustible materials. As these facilities are unattended, a fire could spread, causing severe damage to protection and control wiring and equipment, which would cause extended and widespread outages. Restoring a terminal station severely damaged by fire to normal operation could take months.

To protect the control cabinets, cables, and any other critical equipment from being destroyed by a fire without damaging sensitive electronic equipment and wiring, Hydro is installing fire suppression systems in its 230 kV terminal stations.

In the 2014 CBA project Install Fire Protection Upgrades - Holyrood [7,8] and the 2016 CBA project Install Fire Protection in 230 kV Stations - Bay d'Espoir,[9,10] Hydro received approval to install fire protection in the Holyrood and Bay d'Espoir Terminal Stations, respectively. Due to their criticality, Hydro intends to continue its program to install fire suppression systems in all 230 kV terminal stations.

3.2.3 Control Buildings

Terminal station control buildings contain critical station infrastructure, such as protection, control, and monitoring equipment, telecontrol equipment, station service equipment, and compressed air systems. Many control buildings also contain office, breakroom, and washroom facilities for use by Hydro crews when working in the station. As the equipment in control buildings is critical to the function of the terminal station, Hydro must ensure the structural integrity, weather-tightness, and security of its control buildings. While addressing these issues, Hydro also ensures that building auxiliaries (such as

[7] "Newfoundland and Labrador Hydro – 2014 Capital Budget Application," Newfoundland and Labrador Hydro, August 5, 2013, vol. I, sch. D, p. D-76.
[8] As approved in Board Order No. P.U. 42(2013).
[9] "2016 Capital Budget Application," Newfoundland and Labrador Hydro, July 31, 2015, vol. III, tab 26.
[10] As approved in Board Order No. P.U. 33(2015).

electrical, plumbing, and HVAC systems) function properly to ensure reliable and safe operation and use of the terminal station and the control building.

Typical refurbishment activities for control buildings involve the replacement of the roof membrane (Figure 16), siding, and doors (Figure 17) and may also include the replacement of electrical equipment (such as distribution panels, transfer switches, or low-voltage disconnects), plumbing (such as water service entries and internal plumbing), and HVAC (such as intake and exhaust fans, louvers, heaters, and air conditioning equipment).

Based on building conditions, Hydro proposes the refurbishment or replacement projects for the standalone control building, as required.



Figure 16: Terminal Station Control Buildings Showing Cracking and Deterioration of the Roof Membrane System



Figure 17: Building Exterior Cladding and Exterior Doorways Displaying Severe Rusting and Deterioration

3.3 Protection, Control, and Monitoring

3.3.1 Protection and Control Upgrades and Refurbishment

3.3.1.1 Introduction

The terminal station protection and control system automatically monitors, analyzes, and causes action by other equipment (such as breakers) to ensure the safe, reliable operation of the electrical system or to initiate action when system operators issue a command. The protection and control system also indicates and allows for the recording of system conditions and alarms for analysis. Hydro carries out capital work on various protection and control equipment, including:

- Protective relays;
- Breaker failure protection;
- Circuit breaker reclosing controllers;
- Tap changer controls;
- Data alarm systems;
- Digital fault recorders ("DFR"); and
- Cables and panels.

3.3.1.2 Program Description and Justification

Electromechanical and Solid State Protective Relay Replacement

Protective relays monitor and analyze the operational conditions of the electrical system. When a relay identifies unacceptable operating conditions (such as a fault), it will initiate an action to isolate the source of the condition by commanding high-voltage equipment (such as breakers) to operate. Protective relays play a crucial role in maintaining system stability and preventing hazardous conditions from damaging electrical equipment or harming personnel.

Older obsolete relays existing on Hydro's system are the electromechanical and older solid-state types, which lack features such as data storage and event recording capability. Modern digital multifunction relays are used to replace these older-style relays, as they have increased setting flexibility, fault disturbance monitoring, communications capability, and metering functionality and offer greater dependability and security, enhancing system reliability. Digital and electromechanical relays are shown in Figure 18.

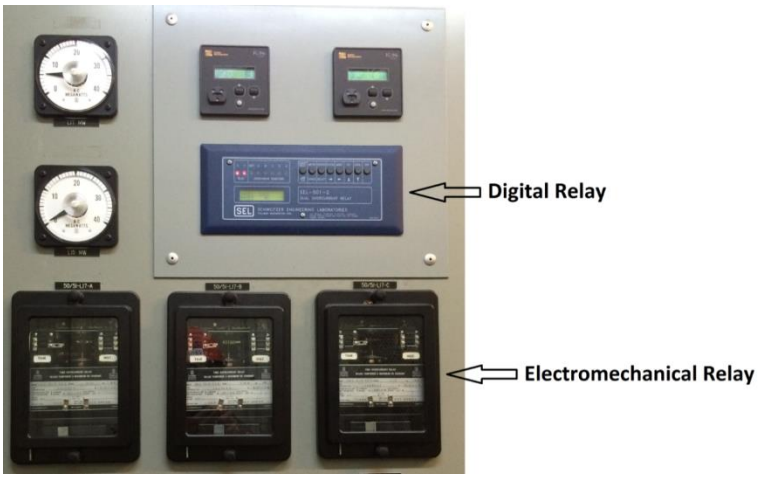


Figure 18: Digital and Electromechanical Relays

It is stated that "Hydro also plans to review its existing transformer, bus and line protections in an effort to develop plans for future implementation of modern digital relays with data storage and fault recording capabilities."[11] To fulfill this commitment, Hydro completed the following:

- A review of all transformer, bus, and line protection on 230 kV, 138 kV, and 69 kV systems, including data storage and fault recording capabilities; and
- A plan to replace all existing electromechanical transformer, bus, timer, and line protection relays with modern digital relays. Priority was given to the 230 kV relay, as Phase 1, with 138 kV and 69 kV to follow.

Hydro will continue to execute the replacement of 230 kV electromechanical and obsolete solid-state generator, transformer, line, and bus relays with modern digital multifunction relays, which began in 2016 under the Replace Protective Relays project.[12] Additionally, Hydro installed redundant multifunction transformer protection relays in 2016 for transformers rated above 10 MVA.[13] Under this program, Hydro will continue to install these upgrades.

Furthermore, Hydro plans to replace protection relays in the Wabush Terminal Station on 46 kV feeders. Each replacement is currently planned to coincide with the replacement of the circuit breaker associated with that protection.

Breaker Failure Protection

Protective relaying is designed to trip a breaker during fault conditions to remove the fault from the electrical system to minimize equipment outages and maintain system stability and safe, reliable operation. When a breaker does not properly isolate a fault, other breakers will be commanded to trip to isolate the fault. This will result in larger outages but will ensure isolation of the original fault in time to minimize damage to equipment and minimize impact to the system. The failure of a breaker to isolate a fault when commanded is called a breaker failure.

[11] "Report to the Board of Commissioners of Public Utilities Related to Alarms, Event Recording Devices, and Digital Relays," Newfoundland and Labrador Hydro, August 1, 2014, sec. 3.1, p. 7/26–28.
[12] "2016 Capital Budget Application," Newfoundland and Labrador Hydro, July 31, 2015, vol. III, tab 19.
[13] In line with Section 1 of Hydro's "NL Hydro Protection & Control Standard – Transformer Protection," included as Attachment 1 to its response to CA-NLH-037, filed as part of the 2016 CBA proceeding.
http://pub.nl.ca/applications/ARCHIVE/2016/NLH2016Capital/files/rfi/CA-NLH-037.PDF

Prior to 2014, breaker failure protection was implemented only in Hydro's 230 kV terminal stations. In 2014, Hydro completed a review of breaker failure protection in 66 kV and 138 kV terminal stations. Hydro also developed a protection and control standard, "Application of Breaker Failure Relaying," calling for breaker failure protection on transmission breakers rated at 66 kV and above. From this review, Hydro identified 20 terminal stations requiring breaker failure protection.

As part of Hydro's 2016 CBA, Hydro proposed and received Board approval for the installation of breaker failure protection in three terminal stations.[14,15] Hydro will continue its plan to execute the installation of breaker failure protection in the remaining terminal stations. Hydro has also identified concerns with the reliability of legacy breaker failure in 230 kV stations and will be replacing, as necessary, under this program.

Tap Changer Paralleling Control Replacement

Tap changer paralleling controls are designed to:

- Ensure the load bus voltage is regulated, as prescribed by the setting;
- Minimize the current that circulates between the transformers, as would be due to the tap changers operating on inappropriate tap positions; and
- Ensure the controller operates correctly in multiple transformer applications regardless of system configuration changes or station breaker operations and resultant station configuration changes.

Current tap changer controls are of similar vintage as the power transformers, dating back to the late 1960s, and require replacement. Recent feedback from the tap changer paralleling control supplier indicated older equipment has capacitors that will dry out over time, resulting in control issues. It was recommended the same controller model be applied to all transformers to optimize tap-changing control. The control issues described by the supplier have been seen by Hydro staff at numerous sites.

Hydro began replacing tap changer paralleling controls in 2019 at the Western Avalon Terminal Station.

[14] "2016 Capital Budget Application," Newfoundland and Labrador Hydro, July 31, 2015, vol. I, sch. D, p. D-388.
[15] As approved in Board Order No. P.U. 33(2015).

Equipment Alarm Upgrades

Alarms inform the Energy Control Centre ("ECC") and operating personnel that equipment and relaying require attention. These alarms are communicated to the ECC and/or displayed locally on the station annunciator (Please refer to Figure 19).



Figure 19: Annunciator Commonly Found in Hydro Terminal Stations

Hydro's review of alarms, event recording devices, and digital relays found that by providing more detailed alarm schemes, the ECC and local operators are able to troubleshoot system events more accurately and quickly; as such, Hydro plans to continue installing improved data alarm management in 230 kV terminal stations whose existing data alarm management includes grouped alarms.

Hydro's internal study identified required increases to alarm detail to the ECC for five 230 kV terminal stations assessed—Stony Brook, Holyrood, Sunnyside, Oxen Pond, and Massey Drive. Hydro proposed and received approval to implement the proposed upgrades at the Stony Brook Terminal Station as part of the 2016 CBA Upgrade Data Alarm Systems project.[16,17] Hydro will continue its plan to install improved data alarm management with the remaining stations being addressed in future CBAs.

Deterioration of an annunciator can result in the failure of individual alarms or the whole unit, which may negatively affect the safe and reliable operation of the generation and transmission systems. For this reason, Hydro also replaces deteriorated obsolete annunciators.

[16] "2016 Capital Budget Application," Newfoundland and Labrador Hydro, July 31, 2015, vol. I, sch. D, p. D-374.
[17] As approved in Board Order No. P.U. 33(2015).

Digital Fault Recorders

DFR records analog electrical data (such as voltage, frequency, and current) and digital relay contact positions at a high resolution to allow Hydro to determine the cause and location of an electrical fault. This data allows Hydro to restore service in a timely manner, address system configurations and settings to mitigate the impact of future faults, and improve the protection of critical electrical infrastructure. Hydro has DFRs deployed in several stations and has a program to install DFRs in areas where Hydro does not have sufficient DFR coverage to allow the analysis of faults.

Protection and Control Cable and Panel Modifications

This program will cover protection and control panels and wiring that may require alteration, replacement, or addition to existing wiring due to deterioration from environmental conditions, accidental damage, or the modification/addition of protection and control equipment.

Appendix G

Risk Evaluation Matrix



Impact	Safety	Environment	System Reliability					
						General Plant and Business Continuity		
			Generation	Transmission and Terminals	Distribution	Buildings and Land	Tools and Equipment	Electronic Devices, Software, Telecontrol and Cyber Security (Including IT/OT/IS)
Very High (5)	• Fatality or injury causing permanent disability	• Regulatory non-compliance resulting in shut down of all operations for extended period • Major impact of extended duration requiring full-scale response • Damage will be evident for more than 10 years • Observed effect observed beyond a 10-km radius from Hydro property	• Loss of generation totalling 100 MW or greater • Loss of multiple prime power diesel generating units • Incident occurs between December and February on the Island or between October and April in Labrador • Total loss of control of generating units by the Energy Control Centre • Total loss of hydraulic control structure	• Non-redundant equipment serving an industrial customer or Newfoundland Power urban area • Non-redundant equipment interconnecting generation to the Island or Labrador Interconnected Systems • Non-redundant 230 kV or supporting equipment	• Impact to an entire region (e.g., Avalon Peninsula Newfoundland Power customers) • Restoration time >36 hours or rotating outages for >36 hours	• Building unsafe to enter • Damage to equipment inside a building leading to a business or service interruption of key infrastructure/critical assets (including IT/OT/IS) at multiple critical sites concurrently, or suspension of all operations for any amount of time • Inability to access assets due to the condition of land	• Inability to utilize tools or equipment, leading to a business or service interruption of key infrastructure/critical assets (including IT/OT/IS) at multiple critical sites concurrently	• Service interruption of multiple critical services (infrastructure and applications) concurrently or the suspension of all operations for any amount of time • Complete loss of electrical system stability • Cyber security threat event with multiple severe adverse effects on multiple organizational operations, assets, individuals, customers, or other organizations • Interruption to multiple non-critical services (infrastructure or applications) concurrently or suspension of non-critical operations for >50% of users
High (4)	• Safety event involving a lost-time injury	• Regulatory non-compliance with stop work orders issued • Extended clean-up effort required • Damage will be evident for next 5–10 years • Observed effect within a 10-km radius from Hydro property	• Loss of generation totaling 75 MW or greater • Loss of a prime power diesel generating unit • Incident occurs between April and November on the Island or between May and September in Labrador • Partial loss of control of a hydraulic control structure • Loss of control of a terminal station or non-staffed generating station by the Energy Control Centre	• Redundant equipment serving industrial customers or Newfoundland Power urban area • Redundant equipment interconnecting generation to the Island or Labrador Interconnected Systems • Redundant 230 kV or supporting equipment	• Impact on remote island community or other Newfoundland Power urban areas (St. John's Metro, Grand Falls, Gander, Corner Brook, >5,000 customers) • Restoration time is 24–36 hours or rotating outages for 24–36 hours	• Damage to equipment inside a building leading to a business or service interruption of key infrastructure/critical assets (including IT/OT/IS) at a single critical location with an outage length 24–36 hours, or rotating outages 24–36 hours • Inability to access assets by ground due to condition of land	• Inability to utilize tools or equipment, leading to a business or service interruption of key infrastructure/critical assets (including IT/OT/IS) at a critical site	• Service interruption of a single critical service (infrastructure or application) resulting in the loss of control/visibility of assets by the Energy Control Centre, impacts to the electricity system, or the inability to perform a critical function of the business • High impact on electrical system stability • Cyber security threat event with a severe adverse effect on organizational operations, assets, individuals, customers, or other organizations • Interruption to a critical service (infrastructure or application) where non-critical functions cannot be performed and 150–300 users are impacted
Moderate (3)	• Injury leading to a medical treatment incident	• Regulatory non-compliance Identified by government inspector, resulting in administrative penalty • Reportable with some cleanup measures • Temporary damage • Observed effect on/directly adjacent to Hydro property (within 500-m radius)	• Loss of generation totaling 50 MW to 75 MW • Incident occurs between November and March on the Island or between September and April in Labrador	• Redundant 138 kV or supporting equipment • Non-redundant 66 kV/69 kV class or supporting equipment	• Impact to 1,000–5,000 customers • Restoration time of 12–24 hours	• Damage to equipment inside a building leading to a business or service interruption of infrastructure/assets (including IT/OT/IS) at multiple non-critical locations or a single critical location causing a disruption in performance levels between 12 and 24 hours, without suspending operations • Access to assets by ground leads to greater than a 12–24 hour delay in arrival	• Inability to utilize tools or equipment, leading to a business or service interruption of infrastructure/assets (including IT/OT/IS) at a non-critical site for 72–96 hours	• Service interruption of a single critical service (Infrastructure or application) resulting in an indirect impact to the Energy Control Centre, the electricity system, or a critical business function is compromised • Medium impact on electrical system stability • Cyber security event where the organization can safely perform primary functions at a reduced capacity • Interruption to non-critical service (infrastructure or application) where non-critical functions cannot be performed and between 50 and 150 users are impacted
Low (2)	• Injury requiring first aid treatment	• Regulatory non-compliance addressed by internal improvement initiatives • Reportable with limited clean-up measures • Non-permanent damage • Observed effect on Hydro property only	• Loss of generation totaling 25 MW to 50 MW • Incident occurs between May and October on the Island or between June and August in Labrador	• Redundant 138 kV or supporting equipment • Non-redundant 66 kV/69 kV class or supporting equipment	• Impact to 100–1,000 customers • Restoration time <8 hours	• Damage to equipment inside a building leading to a business or service interruption of non-critical infrastructure/assets or of critical infrastructure/assets that is restorable in 4–12 hours without disruption to performance levels • Access to assets by ground leading to 4–12 hour delay in arrival	• Inability to utilize tools or equipment, leading to a business or service interruption of infrastructure/assets (including IT/OT/IS) at a non-critical site for 48–72 hours	• Service interruption to a single critical service (infrastructure or application) with no impact on the Energy Control Centre or the electricity system but a critical business function is compromised • Low impact on electrical system stability • Cyber security event where the organization can safely perform primary functions • Interruption to non-critical service (Infrastructure or application) with non-critical function compromised for >50 users
Very Low (1)	• Injury not requiring first aid, no absence from work	• No regulatory compliance concern • Not reportable with no cleanup measures • No observed effect on Hydro property or adjacent properties	• Loss of generation up to 25 MW • Incident occurs between June and September on the Island or between July and August in Labrador	• Redundant 66 kV/69 kV class or supporting equipment	• Impact to <100 customers • Restoration time <4 hours	• Damage to equipment inside a building leading to a business or service interruption that is not noticed outside of the operational area monitoring the impacted system • Access to assets by ground leads to a 1–4 hour delay in arrival	• Inability to utilize tools or equipment, leading to a business or service interruption of infrastructure/assets (including IT/OT/IS) at a non-critical site for 24–48 hours	• Service interruption to a single critical service (infrastructure or application) with no impact on the Energy Control Centre, the electricity system, or any critical business functions • No impact on electrical system stability • Cyber security event where there are no impacts to the electricity system or any business functions • Interruption to Non-critical service (infrastructure or application) with little to no impact on users

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Risk Mitigated

General Plant	Risk Mitigated
Telecommunications In-Service Failures (2027)	12.0
Refurbish Intake Access Road (2027-2028) - Bay d'Espoir	12.0
Upgrade Line Depot (2027-2029) - Bay d'Espoir	12.0
Construct Pole Storage Ramps (2027-2028) - Happy Valley	12.0
Replace Network Communications Equipment (2027-2028)	12.0
Perform Accessibility Upgrades (2027)	12.0
Upgrade Core Information Technology Infrastructure (2027)	12.0
Perform Facilities Refurbishments (2027)	12.0
Perform Minor Telecommunications Enhancements (2027)	12.0
Replace 48 V Battery Banks and Chargers (2027-2028)	12.0
Update Cybersecurity Infrastructure (2027)	10.0
Replace Heavy-Duty Mobile Equipment (2027-2028)	9.0
Install Electric Vehicle Chargers (2027-2028) - Hydro Sites	9.0
Replace Heavy-Duty Vehicles (2027-2029)	9.0
Replace Light-Duty Mobile Equipment (2027)	9.0
Replace Light-Duty Vehicles (2027-2028)	9.0
Upgrade Core Operational Technology Infrastructure (2027)	8.0
Procure Accommodations (2027) - Postville	8.0
Stabilize Powerhouse Slope (2027) - Cat Arm	8.0
Replace Cisco Call Manager Appliances (2027)	8.0
Purchase Tools and Equipment (2027)	8.0
Replace Power Line Carrier (2027-2029) - TL212	8.0
Upgrade Energy Management System (2027-2028)	8.0
Replace Roof (2027-2028) - Cartwright	8.0
Perform Software Upgrades and Minor Enhancements - Information Technology (2027-2028)	8.0
Perform Software Upgrades and Minor Enhancements - Operational Technology (2027)	8.0
Install CCTV Systems (2027)	8.0
Purchase Mobile Devices (2027)	6.0
Procurement of LiDAR for Digitization of Transmission Lines (2027)	6.0
Purchase Personal Computers (2027)	6.0
Migrate Legacy Applications (2027)	6.0
Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2027)	6.0
Clarity Replacement (2027)	6.0
Replace Peripheral Infrastructure (2027)	6.0
SWOP Replacement (2027-2028)	4.0
Install Fire Protection in 230 kV Stations (2027-2028) - Bottom Brook	4.0

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Risk Mitigated

Renewal	Risk Mitigated
Refurbish Aluminum Towers (2027-2028) - TL212	16.0
Replace Hydraulic Lift Pump (2027-2028) - Burnt Dam	15.0
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2027) - Holyrood	15.0
Overhaul Marine Terminal Loading Arms (2027) - Holyrood	15.0
Replace T1 (2027-2029) - Burgeo	15.0
Overhaul Turbine Valves - Unit 1 (2027) - Holyrood	15.0
Distribution System In-Service Failures and Miscellaneous Upgrades (2027)	14.0
Transmission In-Service Failures (2027)	12.0
Diesel In-Service Failures (2027)	12.0
Overhaul Major Pumps and Associated Motors (2027) - Holyrood	12.0
Overhaul Main Enclosure (2027) - Stephenville	12.0
Terminal Station In-Service Failures (2027)	12.0
Thermal In-Service Failures (2027)	12.0
Hydraulic In-Service Failures (2027)	12.0
Wood Pole Line Management (2027)	12.0
Replace Diesel Gensets (2027–2029) - Burnt Dam Spillway	12.0
Overhaul Hydraulic Units (2027)	12.0
Combustion Turbine In-Service Failures (2027)	12.0
Overhaul Generator - Unit 3 (2027) - Holyrood	10.0
Refurbish MD-1 (2027-2030) - Ebbegunbaeg	10.0
Renew Circuit Breakers (2027-2029)	10.0
Perform Major Inspection - Synchronous Condenser 2 (2027-2028) - Wabush Terminal Station	10.0
Replace Instrument Transformers (2027-2028)	10.0
Replace Rip Rap on LD-5 (2027) - Salmon River Spillway	10.0
Install Breaker Failure Protection (2027-2028)	8.0
Renew Diesel Units (2027)	8.0
Replace Disconnects (2027-2029)	8.0
Upgrade Power Transformers (2027–2028)	8.0
Replace Diesel Gensets (2027-2029)	8.0
Refurbish Draft Tube Deck - Phase 3 (2027-2029) - Bay d'Espoir	8.0
Replace Terminal Station Battery Banks and Chargers (2027-2028)	8.0
Replace Annunciator Panel (2027-2028) Upper Salmon	8.0
Replace Protective Relays (2027-2028)	6.0
Renew Distribution Feeders (2027-2028)	6.0
Replace Exciter Controller - SC1 and SC2 (2027-2028) - Wabush	5.0
Perform Dam Infrastructure Refurbishments (2027)	5.0
Inspect Fuel Storage Tanks (2027-2028) - Makkovik	5.0
Perform Level 2 Condition Assessment - West Salmon Spillway (2027-2028) - Upper Salmon	4.0
Replace Circuit Breaker Reclosing Controllers (2027-2028) - Come by Chance	4.0

Service Enhancement	
Distribution Equipment SCADA Additions - Phase I (2027-2028)	12.0
Remove Safety Hazards (2027)	12.0
Upgrade Worst-Performing Distribution Feeders (2027–2028) – Fleur De Lys, Line 1	9.0
Upgrade Blackstart Diesel Instrumentation (2027-2028) - Holyrood	5.0
Upgrade Terminal Station for Mobile Substation (2027-2028) - Glenburnie	2.0

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Risk Mitigated per $1 Million

General Plant	Risk Mitigated Per $1 Million
Telecommunications In-Service Failures (2027)	101.0
Perform Minor Telecommunications Enhancements (2027)	76.4
Replace Cisco Call Manager Appliances (2027)	37.5
Construct Pole Storage Ramps (2027-2028) - Happy Valley	30.3
Update Cybersecurity Infrastructure (2027)	29.2
Perform Software Upgrades and Minor Enhancements - Operational Technology (2027)	29.1
Replace 48 V Battery Banks and Chargers (2027-2028)	24.9
Perform Accessibility Upgrades (2027)	21.6
Purchase Mobile Devices (2027)	18.3
Replace Network Communications Equipment (2027-2028)	17.4
Install Electric Vehicle Chargers (2027-2028) - Hydro Sites	15.0
Install CCTV Systems (2027)	14.5
Upgrade Core Operational Technology Infrastructure (2027)	14.3
Replace Peripheral Infrastructure (2027)	13.0
Clarity Replacement (2027)	12.6
Procurement of LiDAR for Digitization of Transmission Lines (2027)	12.0
Procure Accommodations (2027) - Postville	10.9
Upgrade Energy Management System (2027-2028)	10.5
Perform Facilities Refurbishments (2027)	8.2
Install Fire Protection in 230 kV Stations (2027-2028) - Bottom Brook	6.1
Migrate Legacy Applications (2027)	6.1
Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2027)	6.0
Replace Light-Duty Mobile Equipment (2027)	5.8
Replace Roof (2027-2028) - Cartwright	5.4
Perform Software Upgrades and Minor Enhancements - Information Technology (2027-2028)	5.2
Stabilize Powerhouse Slope (2027) - Cat Arm	4.6
Upgrade Core Information Technology Infrastructure (2027)	4.1
Replace Power Line Carrier (2027-2029) - TL212	3.8
Refurbish Intake Access Road (2027-2028) - Bay d'Espoir	3.7
Purchase Tools and Equipment (2027)	3.7
Purchase Personal Computers (2027)	3.6
Replace Heavy-Duty Mobile Equipment (2027-2028)	3.5
SWOP Replacement (2027-2028)	2.6
Replace Heavy-Duty Vehicles (2027-2029)	2.6
Replace Light-Duty Vehicles (2027-2028)	2.4
Upgrade Line Depot (2027-2029) - Bay d'Espoir	1.9

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Risk Mitigated per $1 Million

Renewal	Risk Mitigated Per $1 Million
Transmission In-Service Failures (2027)	61.7
Replace Hydraulic Lift Pump (2027-2028) - Burnt Dam	60.0
Replace Terminal Station Battery Banks and Chargers (2027-2028)	38.4
Perform Level 2 Condition Assessment - Steel Section (2027) - Paradise River	23.0
Replace Instrument Transformers (2027-2028)	22.9
Replace Circuit Breaker Reclosing Controllers (2027-2028) - Come by Chance	22.7
Replace Annunciator Panel (2027-2028) Upper Salmon	20.8
Overhaul Marine Terminal Loading Arms (2027) - Holyrood	18.0
Replace Rip Rap on LD-5 (2027) - Salmon River Spillway	13.9
Perform Major Inspection - Synchronous Condenser 2 (2027-2028) - Wabush Terminal Station	13.8
Overhaul Main Enclosure (2027) - Stephenville	12.3
Combustion Turbine In-Service Failures (2027)	11.6
Diesel In-Service Failures (2027)	9.5
Perform Dam Infrastructure Refurbishments (2027)	9.5
Replace Exciter Controller - SC1 and SC2 (2027-2028) - Wabush	7.5
Upgrade Power Transformers (2027–2028)	6.2
Replace Diesel Gensets (2027–2029) - Burnt Dam Spillway	6.0
Perform Level 2 Condition Assessment - West Salmon Spillway (2027-2028) - Upper Salmon	6.0
Replace T1 (2027-2029) - Burgeo	5.9
Refurbish Aluminum Towers (2027-2028) - TL212	5.8
Terminal Station In-Service Failures (2027)	5.4
Renew Circuit Breakers (2027-2029)	5.1
Replace Disconnects (2027-2029)	5.1
Refurbish Draft Tube Deck - Phase 3 (2027-2029) - Bay d'Espoir	4.4
Hydraulic In-Service Failures (2027)	3.6
Overhaul Major Pumps and Associated Motors (2027) - Holyrood	3.6
Install Breaker Failure Protection (2027-2028)	3.2
Thermal In-Service Failures (2027)	3.1
Replace Diesel Gensets (2027-2029)	2.9
Overhaul Hydraulic Units (2027)	2.7
Overhaul Generator - Unit 3 (2027) - Holyrood	2.6
Renew Distribution Feeders (2027-2028)	2.2
Renew Diesel Units (2027)	2.2
Distribution System In-Service Failures and Miscellaneous Upgrades (2027)	2.1
Replace Protective Relays (2027-2028)	2.0
Overhaul Turbine Valves - Unit 1 (2027) - Holyrood	1.9
Inspect Fuel Storage Tanks (2027-2028) - Makkovik	1.8
Wood Pole Line Management (2027)	1.5
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2027) - Holyrood	1.5
Refurbish MD-1 (2027-2030) - Ebbegunbaeg	0.9
Service Enhancement	
Remove Safety Hazards (2027)	38.6
Upgrade Blackstart Diesel Instrumentation (2027-2028) - Holyrood	11.4
Distribution Equipment SCADA Additions - Phase I (2027-2028)	8.8
Upgrade Terminal Station for Mobile Substation (2027-2028) - Glenburnie	4.9
Upgrade Worst-Performing Distribution Feeders (2027–2028) – Fleur De Lys, Line 1	2.5

Schedule 2

Five-Year Capital Plan including Major Projects (2027–2031)



2027 Capital Budget Application

Five-Year Capital Plan including Major Projects (2027–2031)



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Appendix A: Five-Year Capital Plan by Investment Class, Major and Minor Asset Category, and Recurring Expenditure Roll-Up (2027–2031)

Appendix B: Capital Expenditures (2022–2031)

1.0 Introduction

In the Board of Commissioners of Public Utilities ("Board") Order No. P.U. 30(2007), the Board directed Newfoundland and Labrador Hydro ("Hydro") to file a five-year capital expenditure plan, commencing with the 2009 Capital Budget Application ("CBA"). The Board indicated the plan should focus on strategic spending priorities over the five-year period, identify changing circumstances and set out alternative approaches under consideration.[1]

In the submission of its 2026 CBA,[2] Hydro provided two separate schedules for the five-year capital plans: the first contained its planned capital expenditures from 2026–2030 excluding Major Projects, and the second included both a detailed five-year plan and ten-year outlook for Major Projects exceeding $50 million.

Subsequent to the submission of the 2026 CBA, the Board directed Hydro "to file a Five-Year Capital Plan that incorporates both major capital and non-major capital projects in a single report."[3] Within its 2027 CBA, Hydro's five-year capital plan includes Major Projects, in accordance with Board direction.

Hydro's five-year capital plan, provided as Appendix A to this schedule, was developed consistent with its investment philosophy to invest responsibly in the electrical system to the benefit of its customers.[4] The five-year capital plan includes details on the costs and timing of forecast asset replacements and refurbishments. The five-year plan is revised considering evolving asset management practices, asset condition information, operational and system requirements, as well as operating environment factors. Recognizing major investment requirements in the five-year capital plan, Hydro continues to take deliberate actions to achieve a lower level of capital investment, where appropriate. As such, Hydro's Five-Year Capital Plan (2027–2031) reflects the capital investments necessary to maintain infrastructure and provide safe, reliable, least-cost electricity for customers, while aiming to balance cost, reliability, and environmental impacts.

[1] Board Order No. P.U. 30(2007), p. 5/37–42.
[2] "2026 Capital Budget Application," Newfoundland and Labrador Hydro, July 15, 2025.
[3] Please refer to "Newfoundland and Labrador Hydro – 2026 Capital Budget Application – Confidential Information," Board of Commissioners of Public Utilities, Newfoundland and Labrador, July 28, 2025.
[4] Hydro has also provided a ten-year summary of Capital Expenditures from 2022–2031 as Appendix B to this schedule.

Total projected spending each year has increased due to the proposed infrastructure required to increase generation capacity to meet evolving electricity needs, as well as Major Projects[5] for life extension of aging assets, and those required to respond to a rapidly changing energy landscape. As per the findings of the 2024 Resource Adequacy Plan,[6] these proposed investments include the installation of a combustion turbine ("CT") with renewable fuel capabilities on the Avalon Peninsula ("Avalon CT") and Unit 8 at the Bay d'Espoir Hydroelectric Generating Station ("Bay d'Espoir"). The 2024 Resource Adequacy Plan provides further details on the projected utility needs in the province and Hydro's plans to meet this demand.

In this report, Hydro has provided a discussion of the major drivers of expenditure in each of the investment classifications, including a discussion of shifts in spending priorities and the circumstances for such shifts, where applicable.

2.0 Five-Year Plan Overview

Hydro's five-year plan reflects an investment of approximately $3.10 billion in plant and equipment over the 2027–2031 period, including $2.24 billion related to Major Projects, and $2.44 million related to investments on specifically assigned assets. The average total annual capital expenditure is approximately $620.9 million when Major Project additions are included, or $172.7 million excluding these additions. At this time, Hydro's five-year capital plan excludes any future application by Hydro for the long-term supply for Southern Labrador, as Hydro is currently reviewing, studying, and implementing ways to ensure that Charlottetown, Pinsent's Arm, and the other communities in the region receive safe, reliable service consistent with environmental responsibility now and long-term. This work is underway.[7] Chart 1 outlines the total capital spend per year for 2027–2031, including the system growth and renewal-driven capital related to Major Projects.

[5] For this document, the term 'Major Project' is generally used to describe regulated projects and programs with an anticipated cost of $50 million or greater under the accountability of Hydro's Major Projects department.
[6] "2024 Resource Adequacy Plan – An Update to the Reliability and Resource Adequacy Study," Newfoundland and Labrador Hydro, rev. August 26, 2024 (originally filed July 9, 2024).
[7] For further information, please refer to "Newfoundland and Labrador Hydro's 2021 Capital Budget Supplemental Application for Approval of the Construction of Hydro's Long-Term Supply Plan for Southern Labrador – Update," Newfoundland and Labrador Hydro, June 25, 2025.

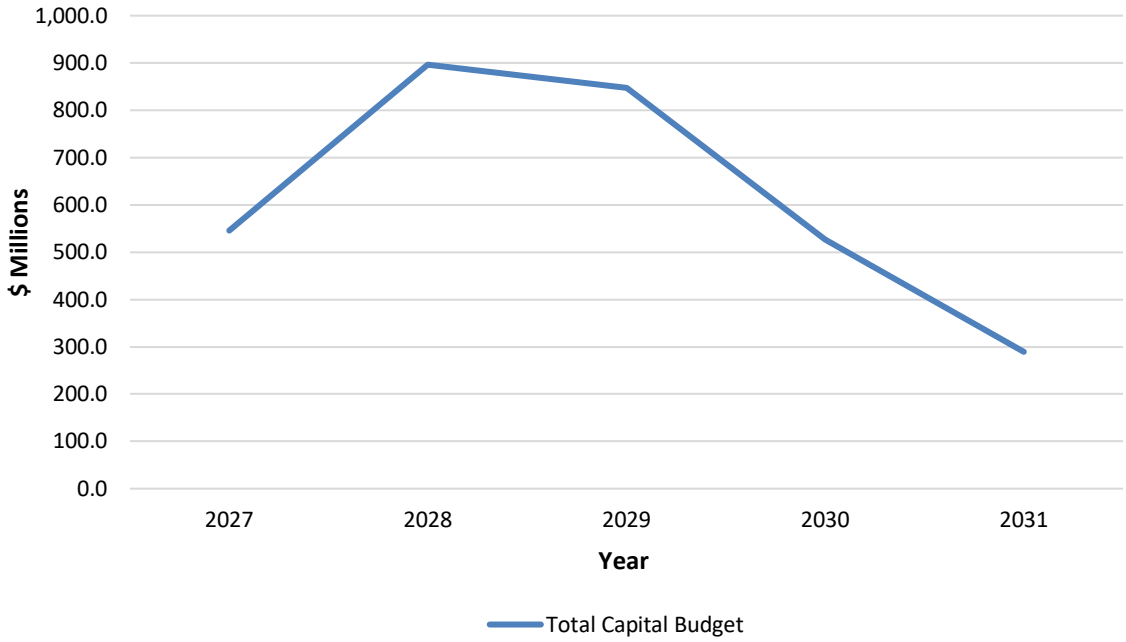


Chart 1: Total Capital Expenditures Including Major Projects (2027–2031)[8]

As shown in Chart 1, total projected spending rises to a peak in 2028, followed by a decline due to the construction schedules of the proposed infrastructure required to increase the generation capacity of existing assets to meet evolving electricity needs.

Through Hydro's ongoing *Reliability and Resource Adequacy Study Review* proceeding ("*RRA Study Review*"), Hydro identified the need for additional generation to meet load growth and system reliability requirements. In the most recent update, the 2024 Resource Adequacy Plan, Hydro focused on the production of an Island Interconnected System Expansion Plan that satisfied both capacity and energy requirements. In the 2024 Resource Adequacy Plan, Hydro recommended the Minimum Investment Expansion Plan. The Minimum Investment Expansion Plan indicates the need for additional generating assets to: (i) enable the retirement of aging assets including Holyrood Thermal Generating Station ("Holyrood TGS"); (ii) ensure reliable system operation in the event of an extended outage on the Labrador-Island Link ("LIL"); and (iii) accommodate anticipated load growth on the Island Interconnected System.[9] A Settlement Agreement arising out of the *RRA Study Review* and the review of the 2024

[8] The Major Projects values represent a portfolio of project estimates generally considered Association for the Advancement of Cost Engineering Class 3 classifications. The "Authorized Cost" for each estimate includes management reserve, contingency, escalation, interest during construction and the base cost estimate, as applicable.
[9] "2024 Resource Adequacy Plan – An Update to the Reliability and Resource Adequacy Study," Newfoundland and Labrador Hydro, rev. August 26, 2024 (originally filed July 9, 2024).

Resource Adequacy Plan was agreed to by the parties,[10] and Hydro filed its application for additional generation in March 2025 for two critical additions to the resource supply—a new 154 MW unit at Bay d'Espoir (Unit 8) and a new 150 MW CT on the Avalon Peninsula. As such, Hydro's planned system growth expenditures trend significantly upward over the 2027–2031 period, primarily as a result of the execution of Major Projects required for additional generation. In support of Hydro's expansion plans and to address transmission bottlenecks, Hydro is exploring the implementation of technical options, including a remedial action scheme, which addresses transmission constraints at a cost that would be significantly lower than that of constructing a new transmission line. Hydro anticipates that further details regarding these potential investments will be provided through the *RRA Study Review;* therefore, pending confirmation of Hydro's plan to address these constraints, these expenditures have been excluded from the capital plan at this time. Future Major Projects may be included as system demands continue to evolve and will be incorporated into Hydro's five-year capital plan, consistent with the outcomes of the *RRA Study Review* at that time.

Renewal expenditures are largely driven by the age of Hydro's assets. The majority of Hydro's installed assets, including the hydroelectric installation at Bay d'Espoir, the Holyrood TGS, the Stephenville Gas Turbine ("GT"), the Hardwoods GT, and much of Hydro's transmission and distribution systems, are more than 40–50 years old and require prudent sustaining capital investment to ensure their continued safe and reliable operation. Renewal-driven capital investments include Major Projects to extend the life of Unit 7, Penstock 2, and Penstock 3 at Bay d'Espoir. In addition, Hydro will be proposing significant capital investments in 2027 related to the overhaul of the Holyrood CT and refurbishment of the Salmon River Spillway. During development of the 2027 CBA, Hydro recognized that the costs of these projects were exceeding or approaching the threshold for Major Projects, and were removed from the CBA to allow for further estimate and project maturity assessment to ensure evidentiary requirements for this magnitude of expenditure were met.[11] Chart 2 identifies the planned expenditures for 2027–2031, excluding Major Projects, which are primarily required for renewal-driven and general plant-related capital.

[10] "2025 Build Application – Bay d'Espoir Unit 8 and Avalon Combustion Turbine," Newfoundland and Labrador Hydro, March 21, 2025, sch. 2.
[11] Estimates included within the five-year plan are high-level and are subject to change based on further estimate refinement and submission of the supplemental capital application.

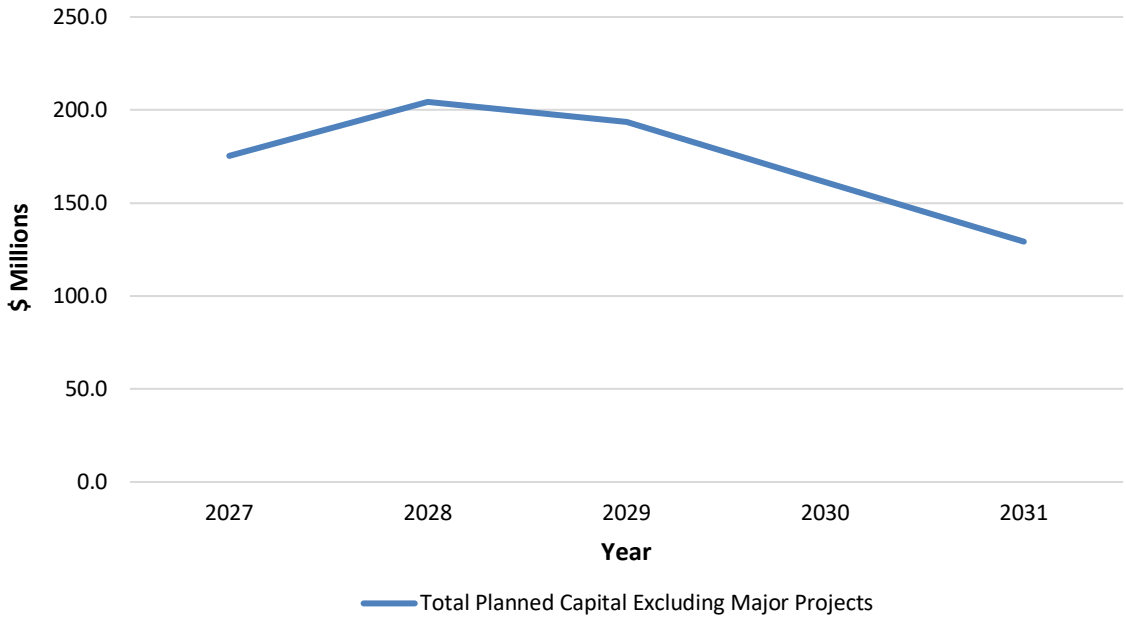


Chart 2: Planned Capital Expenditures Excluding Major Projects (2027–2031)

Other than the expenditures related to Major Projects, renewal-driven capital investments include a refurbishment of Hydro's Upper Salmon Turbine and Generator, a boiler condition assessment at the Holyrood TGS, refurbishment of the Ebbegunbaeg Dam, and the continuation of Hydro's Wood Pole Line Management Program. Other expenditures in the 2027–2031 Five-Year Capital Plan include general plant and service enhancement projects, such as the continuation of Hydro's heavy- and light-duty vehicle and mobile equipment replacement programs, the purchase of a spare Generator Step-up ("GSU") transformer, and the replacement of the Rigolet Diesel Plant, as well as renewal of assets specifically assigned to Industrial customers ($2.44 million).

Hydro has recommended that all three Holyrood TGS units and the Hardwoods GT and Stephenville GT remain available through the Bridging Period[12] while Hydro seeks to develop new long-term sources of supply. In 2021, Hydro engaged Hatch Ltd. ("Hatch") to complete an assessment of the condition of the Holyrood TGS assets and a study of the long-term viability of the Holyrood TGS as a generating facility.[13]

[12] Hydro considers the Bridging Period to be from the present to 2030, or until such time that sufficient alternative generation is commissioned, adequate performance of the LIL is proven, and generation reserves are met. During the Bridging period, the system would rely primarily on existing sources of generation capacity to maintain reliability while new generation capacity is being built. The primary, readily available supply options in this period are extending the retirements of the Holyrood TGS, Stephenville GT and the Hardwoods GT until their capacities can be adequately replaced.
[13] "*Reliability and Resource Adequacy Study Review* – Assessment to Determine the Potential Long-Term Viability of the Holyrood Thermal Generating Station," Newfoundland and Labrador Hydro, March 31, 2022, att. 2.

A refresh of this study to evaluate the continued extension of the Holyrood TGS beyond the current retirement period was completed by Hatch in late 2024 and helped inform Hydro's 2026–2035 capital planning.[14] Hydro's planned thermal generation capital expenditures for the period 2027–2031 reflect the findings of both studies and include projects for the renewal of assets at the Holyrood TGS up until March 31, 2030.

In the 2024 Resource Adequacy Plan, Hydro recommended its Minimum Investment Expansion Plan as a foundational first step toward meeting expected customer demand and recognized the need for continued decision-making to meet the expected case, or reference case. Hydro's expansion plan to meet the incremental requirements for the reference case will be included in the 2027 Resource Adequacy Plan. Future build applications that may occur as a result of the 2027 Resource Adequacy Plan will be incorporated into Hydro's five-year capital plan, consistent with the outcomes of the *RRA Study Review* at that time. Hydro is cognizant of the significant investment that would be required to implement additional generation and therefore will seek opportunities to reduce or defer other capital expenditures in its five-year plan where appropriate and when associated risks can be acceptably mitigated.

3.0 Investment Drivers

In accordance with the provisional CBA Guidelines[15] and continuing its approach initially presented in the 2023 CBA, Hydro has provided a discussion of significant expenditures within each investment classification. This approach allows Hydro to focus its analysis and discussion of planned expenditures to highlight major drivers of investment across its assets. Hydro recognizes that segmentation by asset category also provides valuable insight into its strategy and the drivers of planned investment in its assets, particularly in the context of asset renewal; therefore, where appropriate, Hydro has provided a discussion of significant planned expenditures by asset category within investment classifications.

The substantial level of anticipated expenditures related to Major Projects, when included with the other planned capital expenditures, can obscure trending and cost drivers of general capital expenditures. Expenditures related to Major Projects are related to system growth and asset renewal; however, when Major Projects are excluded, capital expenditures in the five-year plan are primarily

[14] "*Reliability and Resource Adequacy Study Review* – Holyrood Thermal Generating Station Capital Plan Refresh," Newfoundland and Labrador Hydro, March 7, 2025, att. 1.
[15] "Capital Budget Application Guidelines (Provisional)," Board of Commissioners of Public Utilities, January 2022.

driven by investments in asset renewal and general plant. As such, Hydro has provided discussion regarding the investment classifications both including and excluding Major Projects, where applicable, in the sections to follow.

Hydro's five-year planned expenditures, including Major Projects for the period 2027–2031, segmented by investment classification, are presented in Chart 3.

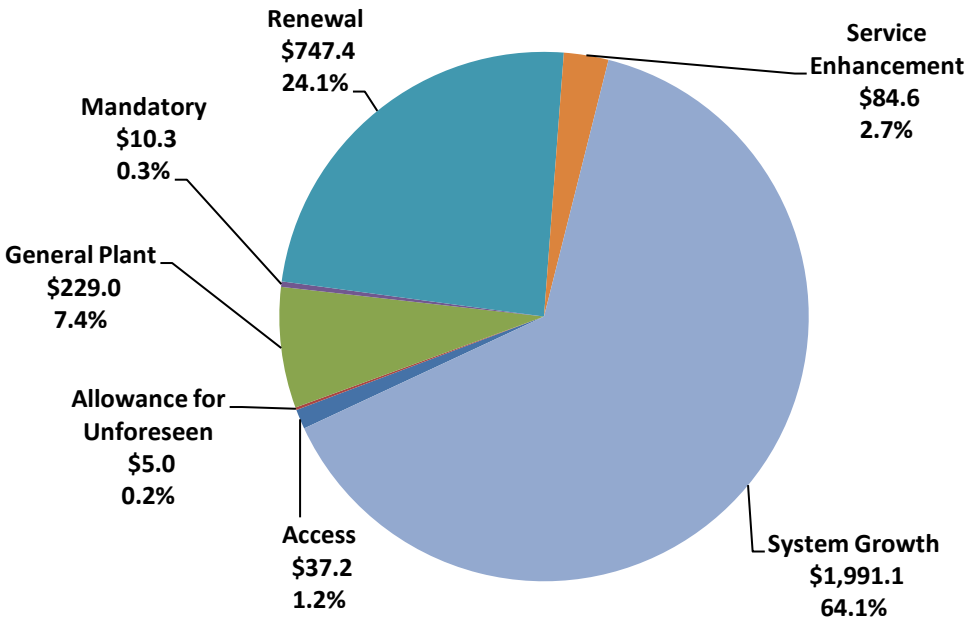


Chart 3: Total Five-Year Capital Expenditures by Investment Classification (2027–2031) ($ Millions)[16,17]

The drivers of investment and any shifts in spending priorities are provided herein, segmented by investment classification. Major Projects are primarily required for renewal-driven and system growth-related capital and as such are included within those investment classes only.

3.1 System Growth

Projects and programs classified as "system growth" are those that are required to modify Hydro's system to meet forecast changes in customers' electricity resource requirements.

[16] The Major Projects values represent a portfolio of project estimates generally considered Association for the Advancement of Cost Engineering Class 3 classifications. The "Authorized Cost" for each estimate includes management reserve, contingency, escalation, interest during construction and the base cost estimate, as applicable.
[17] Numbers may not add due to rounding.

System growth comprises approximately $2.0 billion, or approximately 64%, of Hydro's total capital expenditures for the next five years.

Hydro's total system growth expenditures for the period 2027–2031 are provided in Chart 5. As forecast, within the 2027–2031 period, Hydro's planned system growth Major Project expenditures trend significantly upward, followed by a decline, primarily as a result of the execution of multiple Major Projects required for additional generation on the Island Interconnected System to respond to a rapidly changing energy landscape. As per the findings of the 2024 Resource Adequacy Plan, these investments include the installation of a new 150 MW Avalon CT and Unit 8—a new 154 MW hydroelectric unit in Bay d'Espoir.

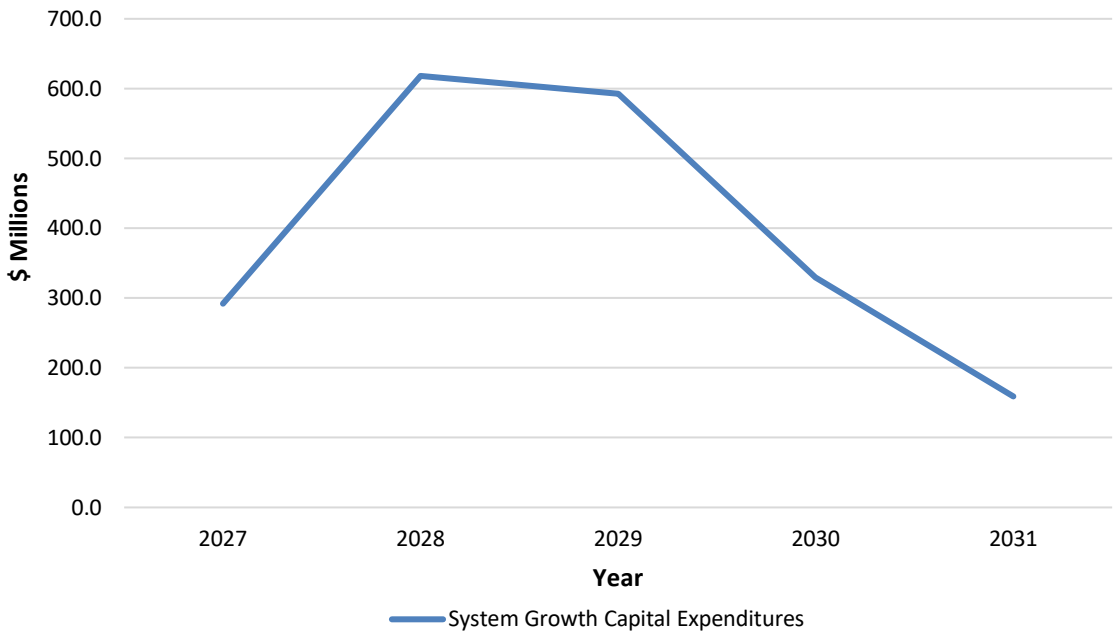


Chart 4: Total System Growth Capital Expenditures (2027–2031)

Hydro's total system growth expenditures for the period 2027–2031, organized by major asset category, are provided in Chart 6. All of the expenditures within the generation asset category are related to Major Projects, which include the installation of Bay d'Espoir Unit 8 and the Avalon CT.

Therefore, excluding Major Projects, Hydro's system growth expenditures for the period 2027–2031 are $74.1 million, primarily driven by the transformer capacity upgrade at Jean Lake Terminal Station and the upgrade of transformers at Sunnyside and Stony Brook.

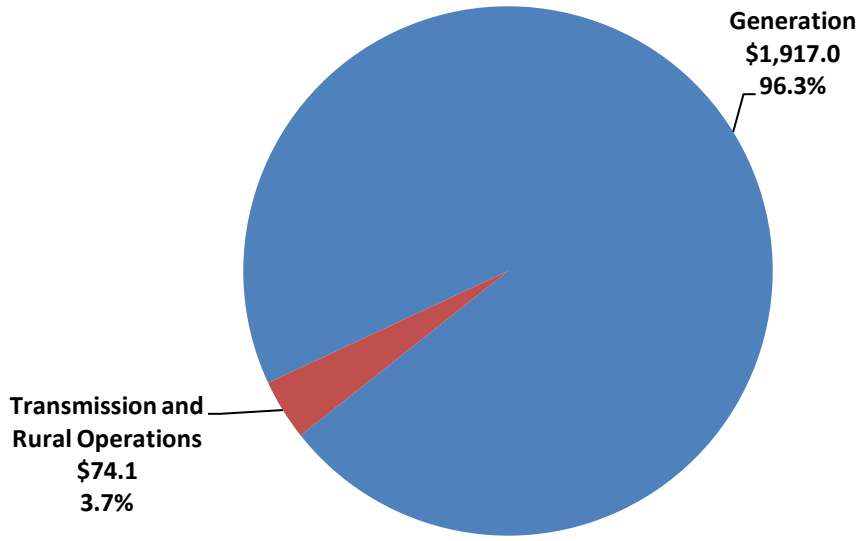


Chart 5: Total Five-Year System Growth Expenditures by Asset Category (2027–2031) ($ Millions)[18]

3.2 Renewal

Projects and programs classified as "renewal" are those that are required to replace and/or refurbish system assets to maintain the ability to provide customers with their current electricity services. Renewal expenditures are critical to ensuring Hydro's ability to sustain its assets and to continue to safely and reliably provide the level of service required to its customers.

Asset renewal comprises approximately $747.4 million, or approximately 24%, of Hydro's total capital expenditures for the next five years. Hydro's total planned renewal expenditures for the period 2027–2031, organized by major asset category, are provided in Chart 6.

[18] Numbers may not add due to rounding.

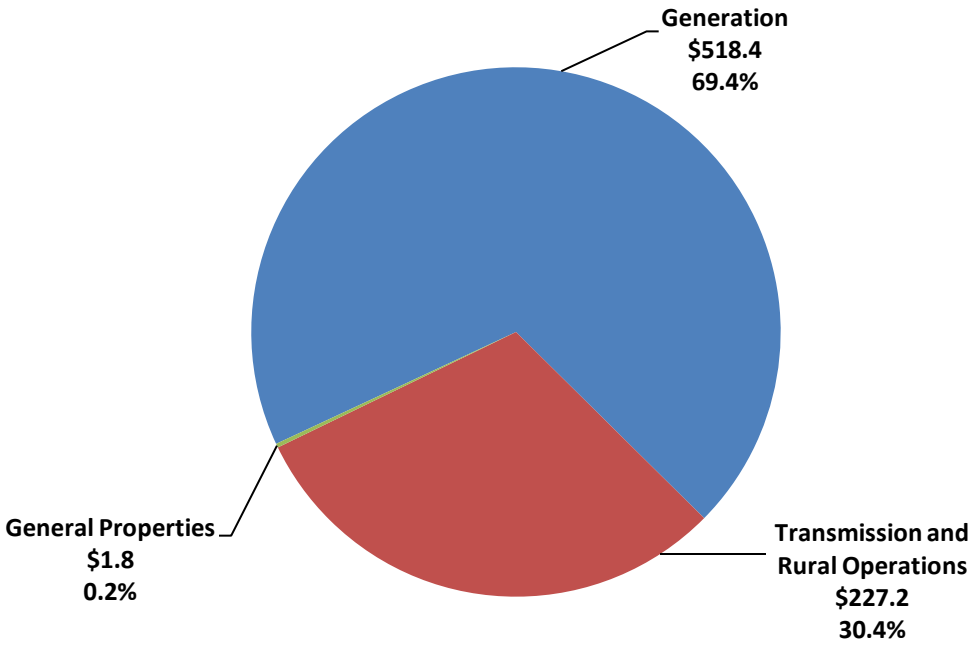


Chart 6: Total Five-Year Renewal Expenditures by Asset Category (2027–2031)
($ Millions)[19]

Generation renewal-driven investment is primarily driven by a number of Major Projects at Bay d'Espoir, including the penstock life extension initiative and the project to extend the life of Unit 7. In addition to Major Projects in Bay d'Espoir, Hydro is planning to undertake major refurbishment of the Salmon River Spillway and complete a major overhaul of the Holyrood CT.

The primary drivers of planned generation renewal investment in Hydro's five-year capital plan are as follows:

- Renewal of Hydraulic Generating Assets – required to renew aging or deteriorating assets associated with Hydro's Hydraulic Generating Assets, including dams and hydraulic structures, unit, turbine, and generator overhauls, and replacement of aging or deteriorating ancillary equipment. In particular, the life extension of Unit 7 at Bay d'Espoir and the refurbishment of the structure at the Salmon River Spillway.
- Renewal of Thermal Generating Assets – required to sustain reliable operation of the Holyrood TGS until 2030, or until such time that sufficient alternative generation is

[19] Numbers may not add due to rounding.

commissioned, adequate performance of the LIL is proven, and generation reserves are met.[20] In particular, annual performance of boiler condition assessments and overhaul of turbine valves on Units 1, 2, and 3, with one unit overhaul planned to commence each year from 2027 through 2029.

- Renewal of CT Assets – in particular, a major overhaul of the Holyrood CT is required on the basis of turbine operating hours, planned to commence in 2027.

- Penstock Life Extension – Phase 2 includes refurbishment of Penstock 2 and Penstock 3, planned to commence in 2029 and 2026, respectively.[21]

Renewal-driven investments also include the In-Service Failures Programs in all years, which is an allotment of funds to be used in the event that immediate refurbishment or replacement must be completed due to the occurrence of an actual failure, the identification of an incipient failure, or the determination of faster-than-anticipated equipment deterioration.[22]

Transmission and Rural Operations ("TRO") renewal-driven investment is forecast to be $227.2 million over the next five years. TRO renewal investment is largely driven by Hydro's asset renewal programs, such as its Wood Pole Line Management and Diesel Unit Replacement and Renewal programs, which are required for the reliable operation of aging assets.

The primary drivers of planned TRO renewal investment in Hydro's five-year capital plan are as follows:

- Renewal of terminal station assets, which is comprised of the continuation of multiple programs to renew aging or deteriorated terminal station assets;
- Hydro's Wood Pole Line Management Program, required for renewal of wood pole transmission lines;
- Hydro's Diesel Unit Replacement and Renewal programs, required to maintain the reliable operation of Hydro's diesel generating stations and maintain customer demand;

[20] Hydro's current capital planning strategy is built on the retirement of Holyrood TGS in 2030; however, as outlined in the Life Extension Condition Assessment Study, Holyrood TGS can remain in operation until 2035. To achieve this timeframe of continued operation, additional significant capital investment is required, above and beyond what is presented within Hydro's five-year capital plan.
[21] Please refer to "Section Replacement and Weld Refurbishment – Bay d'Espoir Penstock 3," Newfoundland and Labrador Hydro, March 12, 2026, which was approved in Board Order No. P.U. 22(2026).
[22] Work will not be completed under this program if it is more appropriate for it to be executed as an allowance for unforeseen or through a capital budget supplemental project.

- Renewal of distribution feeders through Hydro's Renew Distribution Feeders projects; and
- Renewal of steel-tower transmission lines, required to address deficiencies identified by inspection, with two transmission lines currently planned for renewal over the next five years.

Hydro's total renewal expenditures for the period 2027–2031 are provided in Chart 7.

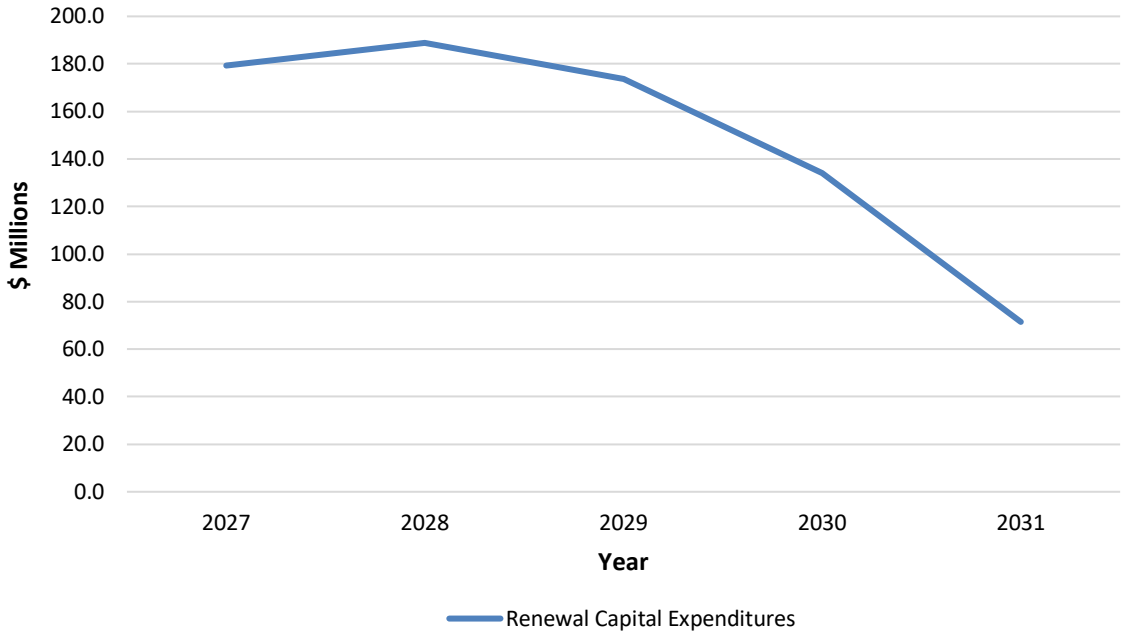


Chart 7: Total Renewal Capital Expenditures (2027–2031)

Excluding expenditures related to Major Projects, generation renewal-driven investment is forecast to total $194.5 million over the next five years. The requirement to invest sustaining capital in generation facilities has been increasing as parts of Hydro's generating facilities approach or surpass their normal expected service lives. Primary drivers for these projects are the end-of-service lives for equipment and deterioration, causing reductions in reliability or performance. Hydro's five-year capital plan also includes investment in projects required for the renewal of Holyrood TGS assets until March 31, 2030.

Hydro's planned renewal expenditures related to Holyrood TGS assets peak in 2027, primarily due to planned expenditures associated with the boiler condition assessment and the continuation of regularly scheduled overhauls of critical generation equipment, and decrease thereafter, as expected. Further discussion of Hydro's planned expenditures for the Holyrood TGS is provided in the Holyrood Thermal Generating Station Overview provided as Schedule 3 of this application.

3.3 General Plant

Projects and programs classified as "general plant" are those related to Hydro's assets that are not part of its generation, transmission, and distribution system. Investment in general plant is required to renew assets that support Hydro's operations, such as transportation, properties, information systems, and telecommunications infrastructure.

General plant totals approximately $229.0 million, or 7% of Hydro's total capital expenditures for the next five years. Hydro's planned general plant expenditures for the period 2027–2031 are provided in Chart 9.

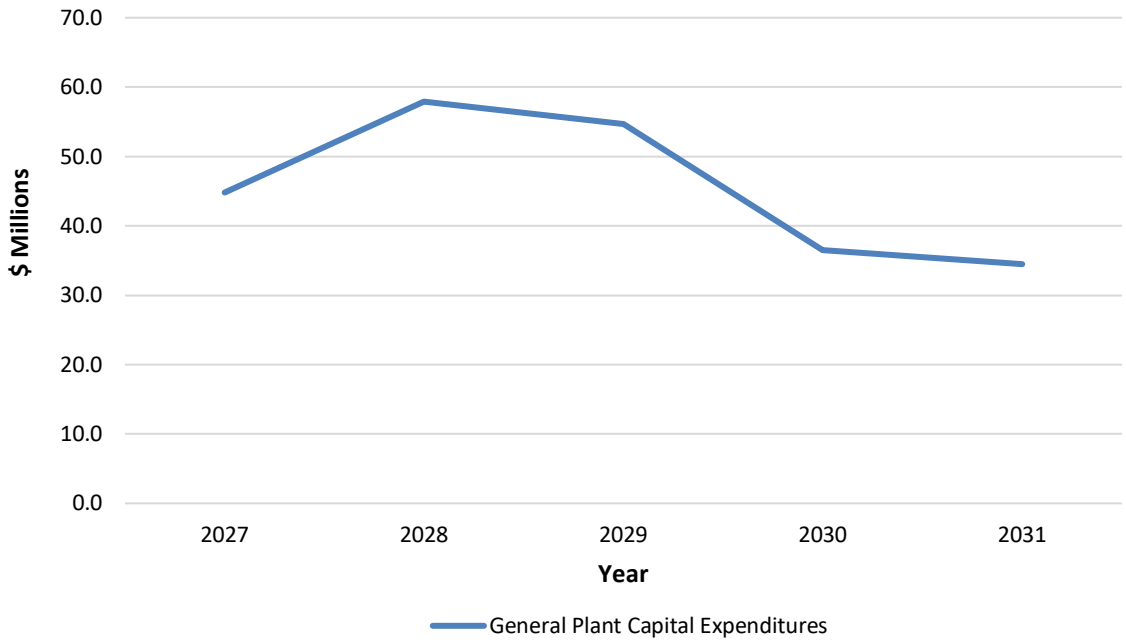


Chart 8: Planned General Plant Capital Expenditures (2026–2030)

Hydro's planned general plant expenditures steadily increase to a peak in 2028, then decline through 2031. The peak in 2028 is primarily associated with expenditures related to heavy- and light-duty vehicles and heavy-duty mobile equipment.

Hydro's total planned general plant expenditures for the period 2027–2031, organized by major asset category, are provided in Chart 10.

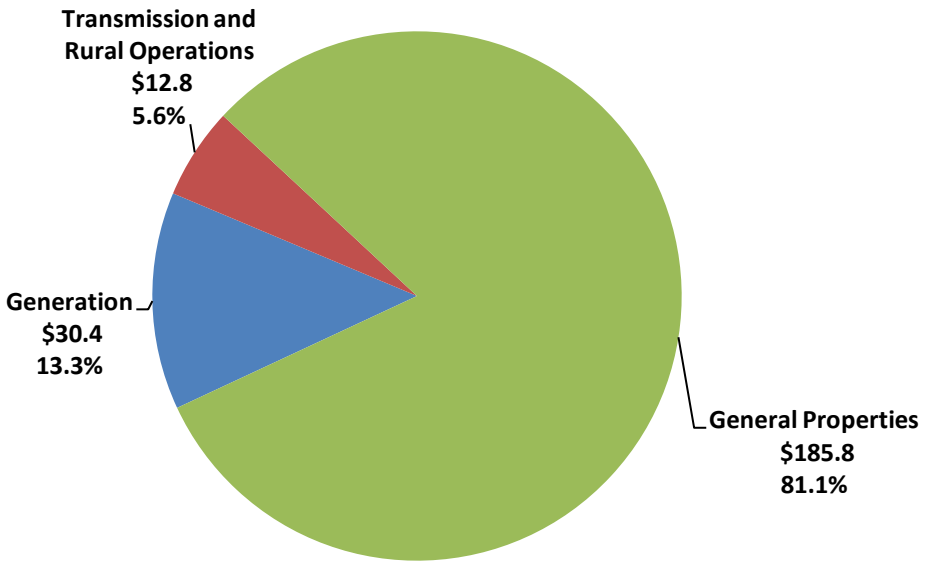


Chart 9: Five-Year Planned General Plant Expenditures by Asset Category (2027–2031)
($ Millions)

The primary drivers of general plant investment in Hydro's five-year capital plan are as follows:

- The Replace Light-Duty Vehicle and Replace Heavy-Duty Vehicles Programs, which continue to experience higher-than-average vehicle expenditures resulting from global supply chain challenges and increased inflation, and are required to renew Hydro's fleet of light- and heavy-duty vehicles that support the operation and maintenance of its assets;
- Programs to perform software upgrades, minor enhancements, and core infrastructure upgrades to Hydro's information and operational technology;
- Projects and programs to renew telecontrol infrastructure, including microwave radio systems, fibre-optic infrastructure, mobile devices, security, and other communications infrastructure; and
- Facilities refurbishment investment required for Hydro's properties, intended to restore their condition, ensure adherence to regulatory requirements, and extend the service life of its facilities.

3.4 Service Enhancement

Projects and programs classified as "service enhancement" are those that modify Hydro's system to meet system operations requirements in a more efficient and/or effective manner, including those that improve safety or environmental compliance. Hydro undertakes service enhancement investments to address known issues that impact Hydro's ability to reliably and safely serve its customers efficiently and effectively.

Service enhancement accounts for approximately $84.6 million, or approximately 3% of Hydro's total capital expenditures for the next five years. Hydro's planned service enhancement expenditures for the period 2027–2031 are provided in Chart 11.

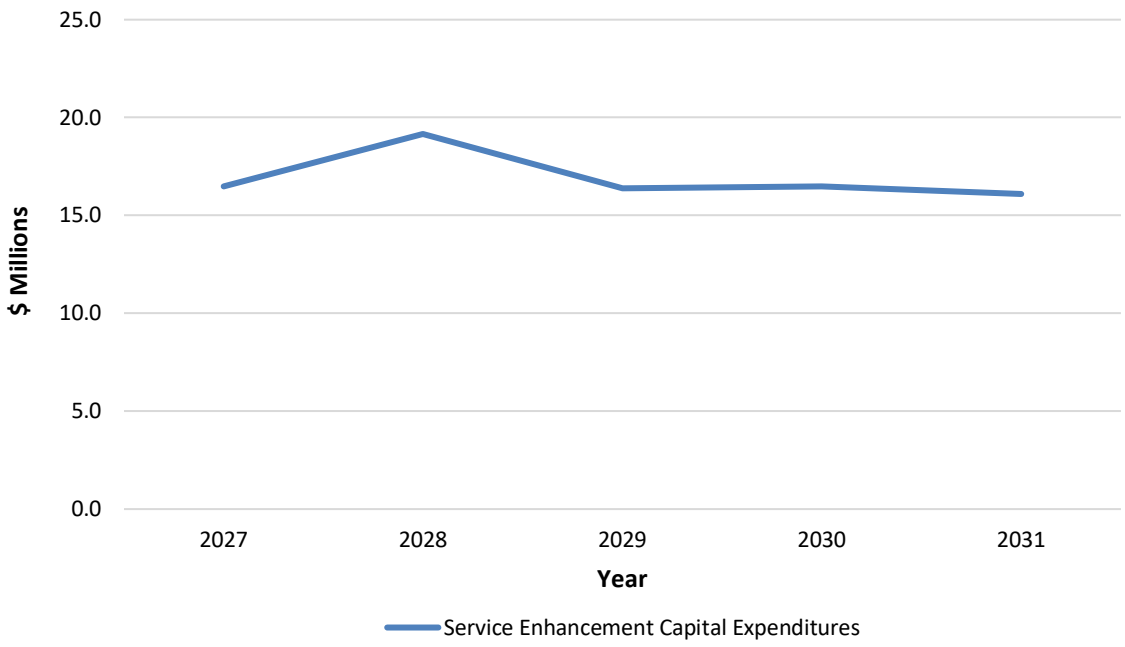


Chart 10: Planned Service Enhancement Capital Expenditures (2027–2031)

Hydro's planned service enhancement expenditures for 2027–2031 peak in 2028, and trend downwards for the remainder of the period; this is primarily due to expenditures associated with the purchase of a spare GSU transformer and the replacement of the Rigolet Diesel Plant.

Hydro's total planned service enhancement expenditures for the period 2027–2031, organized by major asset category, are provided in Chart 12.

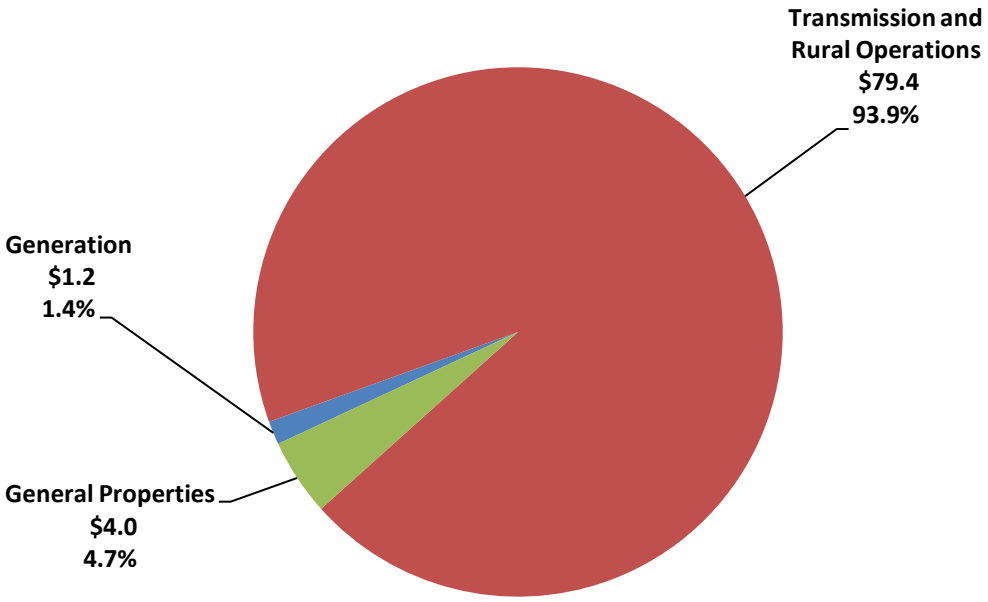


Chart 11: Five-Year Planned Service Enhancement Expenditures by Asset Category (2027–2031) ($ Millions)

The primary drivers of planned service enhancement investment in Hydro's five-year capital plan are related to TRO and are as follows:

- Purchase spare GSU transformer, which is designed for use in multiple locations;
- Replace diesel plant in Rigolet, which replaces the end-of-life diesel generation facility with new generation infrastructure;
- Hydro's Upgrade of Worst-Performing Distribution Feeders project, which is required to address deficiencies on distribution feeders that perform significantly worse than Hydro's average; and
- Modifications to terminal stations to accommodate the interconnection of mobile substations, when required.

3.5 Access

Projects and programs classified as "access" are those required to meet Hydro's obligation to provide customers with access to electricity services. Access-related expenditures account for approximately $37.2 million, or approximately 1%, of Hydro's total capital expenditures for the next five years. Hydro's planned access expenditures for the period 2027–2031 are provided in Chart 13.

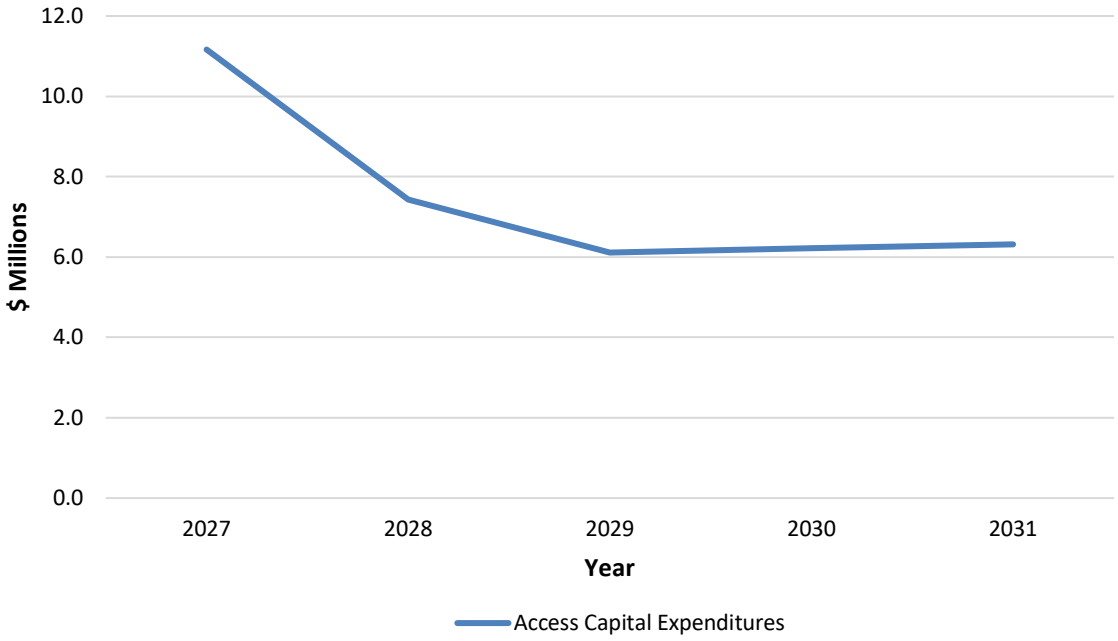


Chart 12: Planned Access Capital Expenditures (2027–2031)

Hydro's planned access-driven expenditures are the highest in 2027, with a slight decline in 2028, remaining relatively consistent for the period 2028–2031.[23] This is due to the relocation of a portion of Transmission Line TL210 at the request of New Found Gold Corporation, planned to conclude in 2027. Hydro's five-year plan also reflects the continuation of the Provide Service Extensions Program, which is required to provide service extensions to accommodate customers' requests for service.

4.0 Conclusion

Hydro's five-year plan reflects an investment of approximately $3.10 billion in plant and equipment over the 2027–2031 period, including $2.24 billion related to Major Projects, and $2.44 million related to investments on specifically assigned assets.

When Major Projects are excluded, capital expenditures in the five-year plan are primarily driven by investments in asset renewal and general plant, and include investments to support service enhancement, access, and system growth. Anticipated Major Project expenditures for the same period are specific to system growth and asset renewal.

[23] Access driven capital expenditures are updated as requests are formalized and approved.

Hydro's five-year capital plan is consistent with its investment philosophy to invest responsibly in the electrical system to the benefit of its customers. Hydro has planned and identified projects to balance capital expenditures with customer reliability, safety, and the environment. The five-year capital plan reflects the significant investments required to meet Hydro's mandate of providing safe, reliable service. Hydro continues to focus on effective cost management and identifying opportunities to minimize impacts to customers.

Appendix A

Five-Year Capital Plan by Investment Class, Major and Minor Asset Category, and Recurring Expenditure Roll-Up (2027–2031)



Newfoundland and Labrador Hydro
2027 Capital Budget Application
Five-Year Capital Plan Summary By Investment Class[1]
($000)

	2026 and Prior Years	2027	2028	2029	2030	2031	Total
Access	2,941.3	11,166.1	7,426.5	6,112.0	6,216.0	6,321.0	**40,182.9**
Allowance for Unforeseen		1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	**5,000.0**
General Plant	16,109.9	44,827.0	58,031.5	54,841.4	36,654.2	34,612.4	**245,076.4**
Mandatory	1,188.8	1,223.4	3,701.5	2,221.6	2,384.5	747.7	**11,467.5**
Renewal	31,319.5	179,327.0	188,908.8	173,768.2	133,961.2	71,462.1	**778,746.7**
Service Enhancement	9,406.0	16,479.1	19,160.2	16,391.9	16,487.3	16,095.3	**94,019.9**
System Growth	135,318.9	291,575.8	618,265.3	592,607.7	329,690.7	158,995.9	**2,126,454.2**
Total Capital Plan	**196,284.4**	**545,598.3**	**896,493.8**	**846,942.9**	**526,394.0**	**289,234.4**	**3,300,947.7**

[1] Numbers may not add due to rounding.

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Five-Year Capital Plan - By Investment Classification[1]
($000)

	2026 and Prior Years	2027	2028	2029	2030	2031	Total
Access							
Battle Harbour Data Solutions Inc. - Non-Firm Service Connection (2026-2027)	334.4	264.7	-	-	-	-	599.1
Interconnection and Integration of the Nain Wind Micro-Grid System	-	233.3	1,077.7	-	-	-	1,311.0
Interconnection and Integration of the Puffin Wind Inc. Renewable Energy Project (2025-2027) - Ramea	1,246.0	32.0	-	-	-	-	1,278.0
Line Extension and Upgrades for Maritime Resources (2026-2028)	256.1	12.6	350.8	-	-	-	619.5
Provide Service Extensions (2027)	-	5,816.7	-	-	-	-	5,816.7
Provide Service Extensions (2028)	-	-	5,998.0	-	-	-	5,998.0
Provide Service Extensions (2029)	-	-	-	6,112.0	-	-	6,112.0
Provide Service Extensions (2030)	-	-	-	-	6,216.0	-	6,216.0
Provide Service Extensions (2031)	-	-	-	-	-	6,321.0	6,321.0
TL210 Modification - New Found Gold (2026–2027)	696.1	3,854.1	-	-	-	-	4,550.2
Upgrade Distribution System (2026-2027) - Wiltondale	408.7	952.7	-	-	-	-	1,361.4
Access Total	**2,941.3**	**11,166.1**	**7,426.5**	**6,112.0**	**6,216.0**	**6,321.0**	**40,182.9**
Allowance for Unforeseen							
Allowance for Unforeseen Items (2027)	-	1,000.0	-	-	-	-	1,000.0
Allowance for Unforeseen Items (2028)	-	-	1,000.0	-	-	-	1,000.0
Allowance for Unforeseen Items (2029)	-	-	-	1,000.0	-	-	1,000.0
Allowance for Unforeseen Items (2030)	-	-	-	-	1,000.0	-	1,000.0
Allowance for Unforeseen Items (2031)	-	-	-	-	-	1,000.0	1,000.0
Allowance for Unforeseen Total	**-**	**1,000.0**	**1,000.0**	**1,000.0**	**1,000.0**	**1,000.0**	**5,000.0**
General Plant							
Augmented Reality / Virtual Reality Rollout (2028)	-	-	557.0	-	-	-	557.0
Clarity Replacement (2027)	-	474.6	-	-	-	-	474.6
Construct Pole Storage Ramps (2027-2028) - Happy Valley	-	58.9	336.6	-	-	-	395.5
Implement Configuration Management Database (2028-2029)	-	-	621.1	200.0	-	-	821.1
Implement Meter Management System (2028)	-	-	500.0	-	-	-	500.0
Implement Performance Management System (2028-2029)	-	-	250.0	350.0	-	-	600.0
Implement Recruitment System (2028-2029)	-	-	100.0	550.0	-	-	650.0
Install CCTV Systems (2027)	-	553.3	-	-	-	-	553.3
Install CCTV Systems (2028)	-	-	477.6	-	-	-	477.6
Install CCTV Systems (2029)	-	-	-	491.9	-	-	491.9
Install CCTV Systems (2030)	-	-	-	-	506.7	-	506.7
Install CCTV Systems (2031)	-	-	-	-	-	521.9	521.9
Install Electric Vehicle Chargers (2027-2028) - Hydro Sites	-	274.5	326.1	-	-	-	600.6
Install Electric Vehicle Chargers (2028-2029) - Hydro Sites	-	-	278.8	326.3	-	-	605.1
Install Electric Vehicle Chargers (2029-2030) - Hydro Sites	-	-	-	284.5	332.2	-	616.7
Install Electric Vehicle Chargers (2030-2031) - Hydro Sites	-	-	-	-	289.6	338.1	627.7
Install Electric Vehicle Chargers (2031-2032) - Hydro Sites	-	-	-	-	-	294.8	294.8
Install Fire Protection in 230 kV Stations (2027-2028) - Bottom Brook	-	73.8	578.3	-	-	-	652.1
Install Plant Heating System (2028-2030) - Holyrood	-	-	4,887.3	6,858.9	3,354.9	-	15,101.1
Microsoft Enterprise Agreement (2028-2030)	-	-	627.2	597.2	597.2	-	1,821.7
Microsoft Enterprise Agreement (2031-2033)	-	-	-	-	-	627.1	627.1
Microsoft Enterprise Agreement (2025-2027)	426.6	426.6	426.6	-	-	-	1,279.9
Migrate Legacy Applications (2027)	-	988.2	-	-	-	-	988.2
Migrate Legacy Applications (2028)	-	-	998.2	-	-	-	998.2
Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2027)	-	992.4	-	-	-	-	992.4
Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2028)	-	-	577.5				577.5
Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2029)	-	-		589.3			589.3
Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2030)	-	-			599.8		599.8
Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2031)	-	-				610.6	610.6
Perform Accessibility Upgrades (2027)	-	555.3	-	-	-	-	555.3
Perform Accessibility Upgrades (2028)	-	-	264.4	-	-	-	264.4
Perform Accessibility Upgrades (2029)	-	-	-	269.0	-	-	269.0
Perform Accessibility Upgrades (2030)	-	-	-	-	273.7	-	273.7
Perform Accessibility Upgrades (2031)	-	-	-	-	-	278.7	278.7
Perform Facilities Refurbishments (2027)	-	1,470.2	-	-	-	-	1,470.2
Perform Facilities Refurbishments (2028)	-	-	2,000.0	-	-	-	2,000.0
Perform Facilities Refurbishments (2029)	-	-	-	2,000.0	-	-	2,000.0
Perform Facilities Refurbishments (2030)	-	-	-	-	2,000.0	-	2,000.0
Perform Facilities Refurbishments (2031)	-	-	-	-	-	2,000.0	2,000.0
Perform Minor Telecommunications Enhancements (2027)	-	157.1	-	-	-	-	157.1
Perform Minor Telecommunications Enhancements (2028)	-	-	163.0	-	-	-	163.0
Perform Minor Telecommunications Enhancements (2029)	-	-	-	166.3	-	-	166.3
Perform Minor Telecommunications Enhancements (2030)	-	-	-	-	169.3	-	169.3
Perform Minor Telecommunications Enhancements (2031)	-	-	-	-	-	172.3	172.3
Perform Software Upgrades and Minor Enhancements - Information Technology (2026-2027)	649.9	1,097.2	-	-	-	-	1,747.1
Perform Software Upgrades and Minor Enhancements - Information Technology (2027-2028)	-	1,298.0	249.4	-	-	-	1,547.4
Perform Software Upgrades and Minor Enhancements - Information Technology (2028-2029)	-	-	1,383.3	210.0	-	-	1,593.3
Perform Software Upgrades and Minor Enhancements - Information Technology (2029-2030)	-	-	-	1,035.7	632.1	-	1,667.8
Perform Software Upgrades and Minor Enhancements - Information Technology (2030-2031)	-	-	-	-	1,247.2	410.0	1,657.2
Perform Software Upgrades and Minor Enhancements - Information Technology (2031-2032)	-	-	-	-	-	1,496.8	1,496.8
Perform Software Upgrades and Minor Enhancements - Operational Technology (2027)	-	274.8	-	-	-	-	274.8
Perform Software Upgrades and Minor Enhancements - Operational Technology (2028)	-	-	250.0	-	-	-	250.0
Perform Software Upgrades and Minor Enhancements - Operational Technology (2029)	-	-	-	350.0	-	-	350.0
Perform Software Upgrades and Minor Enhancements - Operational Technology (2030)	-	-	-	-	275.0	-	275.0
Perform Software Upgrades and Minor Enhancements - Operational Technology (2031)	-	-	-	-	-	325.0	325.0
Procure Accommodations (2027) - Postville	-	732.5	-	-	-	-	732.5
Procure Accommodations (2028) - Labrador	-	-	738.7	-	-	-	738.7
Procure Accommodations (2029) - Labrador	-	-	-	753.8	-	-	753.8
Procure Accommodations (2030) - Labrador	-	-	-	-	767.3	-	767.3
Procure Accommodations (2031) - Labrador	-	-	-	-	-	781.0	781.0
Procurement of Lidar for Digitization of Transmission Lines (2027)	-	500.0	-	-	-	-	500.0
Purchase Mobile Devices (2027)	-	327.0	-	-	-	-	327.0
Purchase Mobile Devices (2028)	-	-	166.0	-	-	-	166.0
Purchase Mobile Devices (2029)	-	-	-	336.5	-	-	336.5
Purchase Mobile Devices (2030)	-	-	-	-	352.3	-	352.3
Purchase Mobile Devices (2031)	-	-	-	-	-	182.1	182.1
Purchase Personal Computers (2027)	-	1,649.6	-	-	-	-	1,649.6
Purchase Personal Computers (2028)	-	-	770.0	-	-	-	770.0
Purchase Personal Computers (2029)	-	-	-	1,250.0	-	-	1,250.0
Purchase Personal Computers (2030)	-	-	-	-	1,080.0	-	1,080.0
Purchase Personal Computers (2031)	-	-	-	-	-	1,350.0	1,350.0
Purchase Tools and Equipment (2027)	-	2,176.0	-	-	-	-	2,176.0
Purchase Tools and Equipment (2028)	-	-	2,218.2	-	-	-	2,218.2
Purchase Tools and Equipment (2029)	-	-	-	2,263.5	-	-	2,263.5
Purchase Tools and Equipment (2030)	-	-	-	-	2,304.0	-	2,304.0
Purchase Tools and Equipment (2031)	-	-	-	-	-	2,345.2	2,345.2

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	2026 and Prior Years	2027	2028	2029	2030	2031	Total
Refurbish Intake Access Road (2027-2028) - Bay d'Espoir	-	465.0	2,796.8	-	-	-	3,261.8
Refurbish Meteorological Stations - Phase 2 (2026-2027)	528.1	167.4	-	-	-	-	695.5
Refurbish Middle and Upper Parking Lots (2028-2029) - Hydro Place	-	-	750.0	1,000.0	-	-	1,750.0
Refurbish Phase 1 Exterior Precast Concrete Panel - Powerhouse 1 (2028-2029) - Bay d'Espoir	-	-	100.0	1,459.6	-	-	1,559.6
Refurbish Rip Rap - CD4 (2028-2029) - Cat Arm	-	-	150.0	1,500.0	-	-	1,650.0
Refurbish Spillway (2028-2030) - North Salmon Spillway	-	-	500.0	1,500.0	1,500.0	-	3,500.0
Refurbish Spillway (2030-2032) - West Salmon Spillway	-	-	-	-	500.0	1,500.0	2,000.0
Refurbish Storm Sewer System (2028-2031) - Bishop's Falls	-	-	560.0	315.0	565.0	245.0	1,685.0
Renew Property, Grounds and Infrastructure (2028)	-	-	737.1	-	-	-	737.1
Renew Property, Grounds and Infrastructure (2029)	-	-	-	61.0	-	-	61.0
Renew Property, Grounds and Infrastructure (2030)	-	-	-	-	460.0	-	460.0
Renew Property, Grounds and Infrastructure (2031)	-	-	-	-	-	740.0	740.0
Replace 48 V Battery Banks and Chargers (2026-2027)	250.1	524.4	-	-	-	-	774.5
Replace 48 V Battery Banks and Chargers (2027-2028)	-	52.3	428.9		-	-	481.2
Replace 48 V Battery Banks and Chargers (2028-2029)	-	-	103.0	484.0	-	-	587.0
Replace 48 V Battery Banks and Chargers (2029-2030)	-	-	-	106.1	498.4	-	604.5
Replace 48 V Battery Banks and Chargers (2030-2031)	-	-	-	-	109.3	513.4	622.7
Replace 48 V Battery Banks and Chargers (2031-2032)	-	-	-	-	-	112.6	112.6
Replace Back-up Generators (2028-2029) - Microwave Repeater Sites (East)	-	-	100.3	415.1	-	-	515.4
Replace Back-up Generators at Microwave Repeater Sites (2026-2027)	94.5	391.3	-	-	-	-	485.8
Replace Burnt Dam Septic System (2028-2029) - Bay d'Espoir	-	-	75.0	250.0	-	-	325.0
Replace Cisco Call Manager Appliances (2027)	-	213.5	-	-	-	-	213.5
Replace Cycle Charge System (2029-2030) - Gull Pond Hill	-	-	-	75.0	250.0	-	325.0
Replace Diesel Shop (2028-2029) - Bishop's Falls	-	-	1,422.0	889.9	-	-	2,311.9
Replace Diesel Shop (2028-2029) - Goose Bay	-	-	500.0	1,500.0	-	-	2,000.0
Replace Gasoline Tank (2030-2031) - Cat Arm	-	-	-	-	25.0	75.0	100.0
Replace GRID Application (2026-2027)	134.9	363.9	-	-	-	-	498.8
Replace Heavy-Duty Mobile Equipment (2026-2028)	173.8	1,809.7	2,112.2	-	-	-	4,095.7
Replace Heavy-Duty Mobile Equipment (2027-2028)	-	1,996.2	579.3	-	-	-	2,575.5
Replace Heavy-Duty Mobile Equipment (2028-2029)	-	-	2,615.2	1,134.7	-	-	3,749.9
Replace Heavy-Duty Mobile Equipment (2029-2030)	-	-	-	1,434.3	1,086.1	-	2,520.4
Replace Heavy-Duty Mobile Equipment (2030-2031)	-	-	-	-	1,698.1	1,383.0	3,081.1
Replace Heavy-Duty Mobile Equipment (2031-2032)	-	-	-	-	-	1,244.8	1,244.8
Replace Heavy-Duty Vehicles (2026-2028)	1,524.1	788.5	2,204.4	-	-	-	4,517.0
Replace Heavy-Duty Vehicles (2027-2029)	-	835.4	1,303.3	1,309.2	-	-	3,447.9
Replace Heavy-Duty Vehicles (2028-2029)	-	-	2,121.4	2,125.5	-	-	4,246.9
Replace Heavy-Duty Vehicles (2029-2031)	-	-	-	782.4	1,327.5	2,702.5	4,812.4
Replace Heavy-Duty Vehicles (2030-2031)	-	-	-	-	929.1	1,924.8	2,853.9
Replace Heavy-Duty Vehicles (2031-2033)	-	-	-	-	-	1,661.6	1,661.6
Replace Light- and Heavy-Duty Vehicles (2025-2027)	4,390.4	3,447.2	-	-	-	-	7,837.6
Replace Light-Duty Mobile Equipment (2027)	-	1,542.0	-	-	-	-	1,542.0
Replace Light-Duty Mobile Equipment (2028)	-	-	1,091.3	-	-	-	1,091.3
Replace Light-Duty Mobile Equipment (2029)	-	-	-	1,285.0	-	-	1,285.0
Replace Light-Duty Mobile Equipment (2030)	-	-	-	-	1,443.8	-	1,443.8
Replace Light-Duty Mobile Equipment (2031)	-	-	-	-	-	1,476.3	1,476.3
Replace Light-Duty Vehicles (2026-2027)	2,547.5	548.6	-	-	-	-	3,096.1
Replace Light-Duty Vehicles (2027-2028)	-	3,125.9	701.6	-	-	-	3,827.5
Replace Light-Duty Vehicles (2028-2029)	-	-	3,083.0	358.9	-	-	3,441.9
Replace Light-Duty Vehicles (2029-2030)	-	-	-	3,334.3	398.6	-	3,732.9
Replace Light-Duty Vehicles (2030-2031)	-	-	-	-	3,055.7	412.5	3,468.2
Replace Light-Duty Vehicles (2031-2032)	-	-	-	-	-	3,381.4	3,381.4
Replace Mobile Equipment (2025-2027)	2,028.2	3,202.3	-	-	-	-	5,230.5
Replace Network Communications Equipment (2026-2027)	1,038.4	99.0	-	-	-	-	1,137.4
Replace Network Communications Equipment (2027-2028)	-	624.6	63.6	-	-	-	688.2
Replace Network Communications Equipment (2028-2029)	-	-	1,100.0	102.0	-	-	1,202.0
Replace Network Communications Equipment (2029-2030)	-	-	-	1,200.0	105.0	-	1,305.0
Replace Network Communications Equipment (2030-2031)	-	-	-	-	400.0	50.0	450.0
Replace Network Communications Equipment (2031-2032)	-	-	-	-	-	500.0	500.0
Replace Peripheral Infrastructure (2027)	-	461.8	-	-	-	-	461.8
Replace Peripheral Infrastructure (2028)	-	-	203.0	-	-	-	203.0
Replace Peripheral Infrastructure (2029)	-	-	-	189.1	-	-	189.1
Replace Peripheral Infrastructure (2030)	-	-	-	-	538.3	-	538.3
Replace Peripheral Infrastructure (2031)	-	-	-	-	-	327.3	327.3
Replace Power Line Carrier (2027-2029) - TL212	-	154.9	1,552.7	419.1	-	-	2,126.7
Replace Powerhouse 2 Roof (2028-2029) - Bay d'Espoir	-	-	100.0	960.0	-	-	1,060.0
Replace Powerhouse Roof (2029-2030) - Cat Arm	-	-	-	100.0	1,500.0	-	1,600.0
Replace Powerhouse Roof (2030 -2031) - Upper Salmon	-	-	-	-	150.0	1,250.0	1,400.0
Replace Radio Link to Hydraulic Control Structure (2026-2027) - Ebbegunbaeg	470.5	756.8	-	-	-	-	1,227.3
Replace Remote Terminal Unit Interface Boards (2028-2030)	-	-	350.0	350.0	350.0	-	1,050.0
Replace Roof (2027-2028) - Cartwright	-	214.5	1,254.2	-	-	-	1,468.7
Replace Simple Network Management Protocol Alarm Encoders (2028-2030)	-	-	200.0	350.0	350.0	-	900.0
Replace Teleprotection Equipment (2026-2028)	964.4	310.6	224.8	-	-	-	1,499.8
Replace Walkway to Toe of Dam (2026-2027) - Paradise River	16.8	566.1	-	-	-	-	582.9
Replace/Upgrade IS Server Room Fire Suppression System (2028) - Hydro Place	-	-	578.1	-	-	-	578.1
Stabilize Powerhouse Slope (2027) - Cat Arm	-	1,729.8	-	-	-	-	1,729.8
SWOP Replacement (2027-2028)	-	1,053.9	455.8	-	-	-	1,509.7
Telecommunications In-Service Failures (2027)	-	118.8	-	-	-	-	118.8
Telecommunications In-Service Failures (2028)	-	-	127.7	-	-	-	127.7
Telecommunications In-Service Failures (2029)	-	-	-	130.0	-	-	130.0
Telecommunications In-Service Failures (2030)	-	-	-	-	132.2	-	132.2
Telecommunications In-Service Failures (2031)	-	-	-	-	-	137.6	137.6
Update Cybersecurity Infrastructure (2027)	-	342.6	-	-	-	-	342.6
Update Cybersecurity Infrastructure (2028)	-	-	575.0	-	-	-	575.0
Update Cybersecurity Infrastructure (2029)	-	-	-	592.0	-	-	592.0
Update Cybersecurity Infrastructure (2030)	-	-	-	-	600.0	-	600.0
Update Cybersecurity Infrastructure (2031)	-	-	-	-	-	611.2	611.2
Upgrade Core Information Technology Infrastructure (2027)	-	2,909.4	-	-	-	-	2,909.4
Upgrade Core Information Technology Infrastructure (2028)	-	-	2,919.0	-	-	-	2,919.0
Upgrade Core Information Technology Infrastructure (2029)	-	-	-	2,165.0	-	-	2,165.0
Upgrade Core Information Technology Infrastructure (2030)	-	-	-	-	1,535.0	-	1,535.0
Upgrade Core Information Technology Infrastructure (2031)	-	-	-	-	-	1,567.5	1,567.5
Upgrade Core IT Infrastructure (2026-2027)	871.6	522.9	-	-	-	-	1,394.5
Upgrade Core Operational Technology Infrastructure (2027)	-	561.2	-	-	-	-	561.2
Upgrade Core Operational Technology Infrastructure (2028)	-	-	950.0	-	-	-	950.0
Upgrade Core Operational Technology Infrastructure (2029)	-	-	-	425.0	-	-	425.0
Upgrade Core Operational Technology Infrastructure (2030)	-	-	-	-	450.0	-	450.0
Upgrade Core Operational Technology Infrastructure (2031)	-	-	-	-	-	650.0	650.0
Upgrade Energy Management System (2027-2028)	-	375.9	385.8	-	-	-	761.7
Upgrade Energy Management System (2029-2030)	-	-	-	397.9	415.7	-	813.6

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	2026 and Prior Years	2027	2028	2029	2030	2031	Total
Upgrade Energy Management System (2031-2032)	-	-	-	-	-	412.3	412.3
Upgrade Fire System (2029) - Holyrood	-	-	-	700.0	-	-	700.0
Upgrade Line Depot (2027-2029) - Bay d'Espoir	-	470.6	1,811.7	3,918.4	-	-	6,200.7
USL 600V and 208V Panelboard Upgrade (2028-2029) - Upper Salmon	-		100.0	140.0	-	-	240.0
Utility Replacement (2028-2030)	-		1,300.0	2,500.0	1,500.0	-	5,300.0
General Plant Total	**16,109.9**	**44,827.0**	**58,031.5**	**54,841.4**	**96,654.2**	**34,612.4**	**245,076.4**
Mandatory							
Inspect Fuel Storage Tanks (2030) - Holyrood	-	-	-	-	650.0	-	650.0
Purchase Meters and Metering Equipment (2027)	-	737.6	-	-	-	-	737.6
Purchase Meters and Metering Equipment (2028)	-	-	707.2	-	-	-	707.2
Purchase Meters and Metering Equipment (2029)	-	-	-	721.6	-	-	721.6
Purchase Meters and Metering Equipment (2030)	-	-	-	-	734.5	-	734.5
Purchase Meters and Metering Equipment (2031)	-	-	-	-	-	747.7	747.7
Replace Metering and Instrument Transformers (2028-2030)	-	-	2,500.0	1,500.0	1,000.0	-	5,000.0
Upgrade PLX Metering System (2026-2028) - Labrador East	1,188.8	485.8	494.3	-	-	-	2,168.9
Mandatory Total	**1,188.8**	**1,223.4**	**3,701.5**	**2,221.6**	**2,384.5**	**747.7**	**11,467.5**
Renewal							
Combustion Turbine In-Service Failures (2027)	-	1,038.0	-	-	-	-	1,038.0
Combustion Turbine In-Service Failures (2028)	-	-	1,059.1	-	-	-	1,059.1
Combustion Turbine In-Service Failures (2029)	-	-	-	1,086.5	-	-	1,086.5
Combustion Turbine In-Service Failures (2030)	-	-	-	-	1,112.0	-	1,112.0
Combustion Turbine In-Service Failures (2031)	-	-	-	-	-	1,138.1	1,138.1
Diesel In-Service Failures (2027)	-	1,256.9	-	-	-	-	1,256.9
Diesel In-Service Failures (2028)	-	-	1,279.1	-	-	-	1,279.1
Diesel In-Service Failures (2029)	-	-	-	1,312.2	-	-	1,312.2
Diesel In-Service Failures (2030)	-	-	-	-	1,343.0	-	1,343.0
Diesel In-Service Failures (2031)	-	-	-	-	-	1,374.5	1,374.5
Discharge Ring Machining and Turbine Refurbishment (2028-2029) - Upper Salmon	-	-	1,500.0	7,500.0	-	-	9,000.0
Distribution System In-Service Failures and Miscellaneous Upgrades (2027)	-	6,665.2	-	-	-	-	6,665.2
Distribution System In-Service Failures and Miscellaneous Upgrades (2028)	-	-	6,914.0	-	-	-	6,914.0
Distribution System In-Service Failures and Miscellaneous Upgrades (2029)	-	-	-	7,055.0	-	-	7,055.0
Distribution System In-Service Failures and Miscellaneous Upgrades (2030)	-	-	-	-	7,181.0	-	7,181.0
Distribution System In-Service Failures and Miscellaneous Upgrades (2031)	-	-	-	-	-	7,310.0	7,310.0
Fabricate and Install Stoplog Racks (2026-2027) - Bay d'Espoir	85.0	659.1	-	-	-	-	744.1
Hydraulic In-Service Failures (2027)	-	3,353.5	-	-	-	-	3,353.5
Hydraulic In-Service Failures (2028)	-	-	3,379.4	-	-	-	3,379.4
Hydraulic In-Service Failures (2029)	-	-	-	3,455.0	-	-	3,455.0
Hydraulic In-Service Failures (2030)	-	-	-	-	3,523.7	-	3,523.7
Hydraulic In-Service Failures (2031)	-	-	-	-	-	3,593.7	3,593.7
Inspect Fuel Storage Tanks (2027-2028) - Makkovik	-	187.5	2,586.3	-	-	-	2,773.8
Inspect Fuel Storage Tanks (2028-2029) - Black Tickle	-	-	127.4	1,766.3	-	-	1,893.7
Inspect Fuel Storage Tanks (2029-2030) - Nain	-	-	-	130.7	1,807.8	-	1,938.5
Inspect Fuel Storage Tanks (2031-2032) - Postville	-	-	-	-	-	136.9	136.9
Install Breaker Failure Protection (2027-2028)	-	993.1	1,523.7	-	-	-	2,516.8
Install Breaker Failure Protection (2028-2029) - Hardwoods	-	-	144.3	298.2	-	-	442.5
Install Breaker Failure Protection (2029-2030) - Wabush Terminal Station	-	-	-	222.3	458.8	-	681.0
Install Breaker Failure Protection (2031-2032) – Upper Salmon	-	-	-	-	-	95.2	95.2
L23/24 Steel-Tower Transmission Line Renewal (2026-2029)	576.2	2,735.3	2,539.1	2,726.8	-	-	8,577.4
Major Combustion Turbine Overhaul (2027–2029) - Holyrood	[redacted]						78,194.3
Overhaul Generator – Unit 3 (2027) - Holyrood	-	3,823.8	-	-	-	-	3,823.8
Overhaul Hydraulic Units (2027)	-	4,436.5	-	-	-	-	4,436.5
Overhaul Hydraulic Units (2028)	-	-	3,897.9	-	-	-	3,897.9
Overhaul Hydraulic Units (2029)	-	-	-	500.0	-	-	500.0
Overhaul Hydraulic Units (2030)	-	-	-	-	1,350.0	-	1,350.0
Overhaul Hydraulic Units (2031)	-	-	-	-	-	1,300.0	1,300.0
Overhaul Main Enclosure (2027) - Stephenville	-	975.4	-	-	-	-	975.4
Overhaul Major Pumps and Associated Motors (2027) - Holyrood	-	3,355.2	-	-	-	-	3,355.2
Overhaul Major Pumps and Associated Motors (2028) - Holyrood	-	-	930.0	-	-	-	930.0
Overhaul Major Pumps and Associated Motors (2029) - Holyrood	-	-	-	420.0	-	-	420.0
Overhaul Marine Terminal Loading Arms (2027) - Holyrood	-	831.1	-	-	-	-	831.1
Overhaul Spherical Valves Unit 1 and 2 (2031-2032) - Cat Arm	-	-	-	-	-	250.0	250.0
Overhaul Turbine Valves - Unit 1 (2027) - Holyrood	-	7,973.1	-	-	-	-	7,973.1
Overhaul Turbine Valves - Unit 2 (2029) - Holyrood	-	-	-	8,500.0	-	-	8,500.0
Overhaul Turbine Valves - Unit 3 (2028) - Holyrood	-	-	12,000.0	-	-	-	12,000.0
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2027) - Holyrood	-	10,119.7	-	-	-	-	10,119.7
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2028) - Holyrood	-	-	8,500.0	-	-	-	8,500.0
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2029) - Holyrood	-	-	-	7,000.0	-	-	7,000.0
Perform Dam Infrastructure Refurbishments (2027)	-	526.3	-	-	-	-	526.3
Perform Dam Infrastructure Refurbishments (2028)	-	-	505.0	-	-	-	505.0
Perform Dam Infrastructure Refurbishments (2029)	-	-	-	505.0	-	-	505.0
Perform Dam Infrastructure Refurbishments (2030)	-	-	-	-	505.0	-	505.0
Perform Dam Infrastructure Refurbishments (2031)	-	-	-	-	-	505.0	505.0
Perform Level 2 Condition Assessment - Turbine and Generator (2028) - Cat Arm	-	-	500.0	-	-	-	500.0
Perform Level 2 Condition Assessment - Chemical Tanks (2031) - Holyrood	-	-	-	-	-	350.0	350.0
Perform Level 2 Condition Assessment - Condenser and Condenser Tubes (2026-2027) - Holyrood	577.3	51.7	-	-	-	-	629.0
Perform Level 2 Condition Assessment - Intake (2029) - Upper Salmon	-	-	-	250.0	-	-	250.0
Perform Level 2 Condition Assessment - Penstock (2029) - Upper Salmon	-	-	-	200.0	-	-	200.0
Perform Level 2 Condition Assessment - Penstock (2030) - Granite Canal	-	-	-		200.0	-	200.0
Perform Level 2 Condition Assessment - Spillway (2029) - Hinds Lake	-	-	-	450.0	-	-	450.0
Perform Level 2 Condition Assessment - Station Service (2029) - Hinds Lake	-	-	-	200.0	-	-	200.0
Perform Level 2 Condition Assessment - Station Service (2029) - Paradise River	-	-	-	200.0	-	-	200.0
Perform Level 2 Condition Assessment - Station Service (2030) - Cat Arm	-	-	-	-	200.0	-	200.0
Perform Level 2 Condition Assessment - Steel Section (2027) - Paradise River	-	174.0	-	-	-	-	174.0
Perform Level 2 Condition Assessment - West Salmon Spillway (2027-2028) - Upper Salmon	-	639.5	29.6	-	-	-	669.1
Perform Major Inspection - Synchronous Condenser 1 (2026-2027) - Wabush Terminal Station	43.0	700.7	-	-	-	-	743.7
Perform Major Inspection - Synchronous Condenser 2 (2027-2028) - Wabush Terminal Station	-	63.6	661.3	-	-	-	724.9
Perform Major Inspection - Synchronous Condenser 2 (2030-2031) - Wabush Terminal Station	-	-	-	-	102.1	579.2	681.3
Perform Modified Major Inspection - Synchronous Condenser 1 (2029-2030) - Wabush Terminal Station	-	-	-	105.0	609.0	-	714.0
Refurbish Air Intake (2031-2032) - Happy Valley	-	-	-	-	-	200.0	200.0
Refurbish Aluminum Towers (2027-2028) - TL212	-	165.7	2,591.3	-	-	-	2,757.0
Refurbish Draft Tube Deck - Phase 3 (2027-2029) - Bay d'Espoir	-	159.6	806.0	839.4	-	-	1,805.0
Refurbish Generator (2030-2032) - Upper Salmon	-	-	-	-	500.0	5,000.0	5,500.0
Refurbish Intake 4 (2026-2028) - Bay d'Espoir	284.4	3,069.4	3,069.4	-	-	-	6,423.2
Refurbish MD-1 (2027-2030) - Ebbegunbaeg	-	665.8	1,919.1	3,312.4	5,137.5	-	11,034.8
Refurbish Spillway (2031-2033) - Hinds Lake	-	-	-	-	-	500.0	500.0
Refurbish Stage II Cooling Water Sumps (2028) - Holyrood	-	-	4,719.0	-	-	-	4,719.0
Refurbish Steel Towers (2029-2030) - TL202/TL206	-	-	-	160.0	2,150.0	-	2,310.0

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	2026 and Prior Years	2027	2028	2029	2030	2031	Total
Refurbish Structure (2027-2031) - Salmon River Spillway							40,322.0
Refurbish Turbine (2030-2032) - Hinds Lake	-	-	-	-	500.0	7,500.0	8,000.0
Refurbish Water Treatment Systems (2026-2027) - Holyrood	524.5	936.3	-	-	-	-	1,460.8
Renew Circuit Breakers (2026-2028)	188.2	2,250.1	1,975.6	-	-	-	4,413.9
Renew Circuit Breakers (2027-2029)	-	130.0	168.9	1,651.6	-	-	1,950.5
Renew Circuit Breakers (2028-2030)	-	-	909.3	329.7	1,841.8	-	3,080.8
Renew Circuit Breakers (2029-2031)	-	-	-	1,084.1	1,241.1	1,321.4	3,646.6
Renew Circuit Breakers (2030-2032)	-	-	-	-	1,407.3	1,082.7	2,490.0
Renew Circuit Breakers (2031-2033)	-	-	-	-	-	1,519.7	1,519.7
Renew Diesel Units (2027)	-	3,642.0	-	-	-	-	3,642.0
Renew Diesel Units (2028)	-	-	2,062.0	-	-	-	2,062.0
Renew Diesel Units (2029)	-	-	-	2,101.0	-	-	2,101.0
Renew Diesel Units (2030)	-	-	-	-	2,137.0	-	2,137.0
Renew Diesel Units (2031)	-	-	-	-	-	2,173.0	2,173.0
Renew Distribution Feeders (2026-2027)	1,015.3	3,053.0	-	-	-	-	4,068.3
Renew Distribution Feeders (2027-2028)	-	242.9	2,432.7	-	-	-	2,675.6
Renew Distribution Feeders (2028-2029)	-	-	246.8	2,402.7	-	-	2,649.5
Renew Distribution Feeders (2029-2030)	-	-	-	254.2	2,474.1	-	2,728.3
Renew Distribution Feeders (2030-2031)	-	-	-	-	261.1	2,541.5	2,802.6
Renew Distribution Feeders (2031-2032)	-	-	-	-	-	268.2	268.2
Renew Self-Supporting Foundation (2029-2030) - TL212	-	-	-	100.0	400.0	-	500.0
Replace 125VDC Battery Bank (2026-2027) – Hardwoods	108.9	37.8	-	-	-	-	146.7
Replace Air Dryer (2026-2027) - Hardwoods	75.2	198.0	-	-	-	-	273.2
Replace Annunciator Panel (2027-2028) Upper Salmon	-	141.3	242.9	-	-	-	384.2
Replace Battery Bank (2026-2027) – Granite Canal	138.8	44.2	-	-	-	-	183.0
Replace Battery Bank 1 – Powerhouse 1 (2031-2032) - Bay d'Espoir	-	-	-	-	-	100.0	100.0
Replace Battery Bank 1 (2030-2031) - Cat Arm	-	-	-		100.0	150.0	250.0
Replace Battery Bank 1 and 2 - Powerhouse 1 (2028-2029) - Bay d'Espoir	-	-	200.0	300.0	-	-	500.0
Replace Battery Bank 1 and 2 (2028-2029) - Hinds Lake	-	-	200.0	300.0	-	-	500.0
Replace Battery Bank 2 (2031-2032) - Upper Salmon	-	-	-	-	-	100.0	100.0
Replace Circuit Breaker Reclosing Controllers (2027-2028) - Come by Chance	-	69.1	107.0	-	-	-	176.1
Replace Circuit Breaker Reclosing Controllers (2028-2029) - HRD B3L18	-	-	58.9	93.3	-	-	152.2
Replace Circuit Breaker Reclosing Controllers (2029-2030) - Indian River	-	-	-	60.4	95.8	-	156.2
Replace Circuit Breaker Reclosing Controllers (2030-2031) - Bear Cove	-	-	-	-	62.0	98.3	160.3
Replace Control System (2029-2030) - Holyrood	-	-	-	100.0	400.0	-	500.0
Replace Controllers (2028-2030) - Granite Canal	-	-	1,250.0	1,250.0	1,250.0	-	3,750.0
Replace DC Fuel Pump (2026-2027) - Hardwoods	90.4	58.4	-	-	-	-	148.8
Replace Diesel Gensets (2025-2027)	2,148.8	4,074.8	-	-	-	-	6,223.6
Replace Diesel Gensets (2027-2029)	-	224.9	258.5	2,308.1	-	-	2,791.5
Replace Diesel Gensets (2027–2029) - Burnt Dam Spillway	-	475.6	1,409.1	107.4	-	-	1,992.1
Replace Diesel Gensets (2028-2030)	-	-	300.0	300.0	2,400.0	-	3,000.0
Replace Diesel Gensets (2029-2031)	-	-	-	550.0	550.0	4,100.0	5,200.0
Replace Diesel Gensets (2030-2032)	-	-	-	-	550.0	550.0	1,100.0
Replace Diesel Gensets (2031-2033)	-	-	-	-	-	300.0	300.0
Replace Disconnects (2026-2028)	169.1	1,694.0	631.6	-	-	-	2,494.7
Replace Disconnects (2027-2029)	-	140.1	834.9	601.9	-	-	1,576.9
Replace Disconnects (2028-2030)	-	-	230.2	427.0	578.9	-	1,236.1
Replace Disconnects (2029-2031)	-	-	-	250.0	461.4	609.1	1,320.6
Replace Disconnects (2030-2032)	-	-	-	-	299.0	537.3	836.2
Replace Disconnects (2031-2033)	-	-	-	-	-	296.9	296.9
Replace Emergency Diesel Genset (2025-2027) - Cat Arm	1,487.3	-	-	-	-	-	1,487.3
Replace Exciter Controller - SC1 and SC2 (2027-2028) - Wabush	-	467.3	200.4	-	-	-	667.7
Replace Fuel Oil Water Injection Pumps (2029) - Holyrood	-	-	-	300.0	-	-	300.0
Replace Generator Protection (2028-2029) - Holyrood	-	-	100.0	150.0	-	-	250.0
Replace Glycol Cooler Coil (2031-2032) - Happy Valley	-	-	-	-	-	50.0	50.0
Replace Governor (2031-2032) - Hinds Lake	-	-	-	-	-	500.0	500.0
Replace Hydraulic Lift Pump (2027-2028) - Burnt Dam	-	89.3	160.7	-	-	-	250.0
Replace Hydraulic Lift Pump (2030-2032) - Paradise River	-	-	-	-	250.0	500.0	750.0
Replace Hydraulic Lift Pump (2031-2033) - Upper Salmon	-	-	-	-	-	250.0	250.0
Replace Instrument Transformers (2026-2027)	371.2	196.1	-	-	-	-	567.3
Replace Instrument Transformers (2027-2028)	-	72.0	365.3	-	-	-	437.3
Replace Instrument Transformers (2028-2029)	-	-	291.6	200.1	-	-	491.8
Replace Instrument Transformers (2029-2030)	-	-	-	256.0	175.3	-	431.2
Replace Instrument Transformers (2030-2031)	-	-	-	-	292.1	194.8	486.9
Replace Instrument Transformers (2031-2032)	-	-	-	-	-	401.2	401.2
Replace Parts of Stage 1: 129 Vdc Batteries and Battery Chargers (2026-2027) - Holyrood	229.1	100.1	-	-	-	-	329.2
Replace Power Cables Synchronous Condensers 1 and 2 (2028-2029) - Wabush Terminal Station	-	-	481.7	1,007.4	-	-	1,489.2
Replace Protective Relays (2026-2027)	616.0	1,969.8	-	-	-	-	2,585.8
Replace Protective Relays (2027-2028)	-	700.1	2,314.2	-	-	-	3,014.3
Replace Protective Relays (2028-2029)	-	-	1,030.7	1,731.2	-	-	2,761.9
Replace Protective Relays (2029-2030)	-	-	-	793.0	1,330.5	-	2,123.5
Replace Protective Relays (2030-2031)	-	-	-	-	929.0	1,514.0	2,443.0
Replace Protective Relays (2031-2032)	-	-	-	-	-	1,250.2	1,250.2
Replace Rip Rap on LD-5 (2027) - Salmon River Spillway	-	719.6	-	-	-	-	719.6
Replace Roof (2026-2027) - Hopedale	190.6	1,791.0	-	-	-	-	1,981.6
Replace Switchgear (2028-2030) - Grand Falls Terminal Station	-	-	141.0	435.6	906.1	-	1,482.7
Replace Switchgear Synchronous Condensers 1 and 2 (2028-2029) - Wabush Terminal Station	-	-	1,192.4	2,492.7	-	-	3,685.1
Replace T1 (2027-2029) - Burgeo	-	309.9	499.8	1,717.3	-	-	2,527.0
Replace Terminal Station Battery Banks and Chargers (2026-2027)	326.1	236.7	-	-	-	-	562.8
Replace Terminal Station Battery Banks and Chargers (2027-2028)	-	26.1	182.4	-	-	-	208.5
Replace Terminal Station Battery Banks and Chargers (2028-2029)	-	-	137.8	94.9	-	-	232.7
Replace Terminal Station Battery Banks and Chargers (2029-2030)	-	-	-	158.6	109.0	-	267.6
Replace Terminal Station Battery Banks and Chargers (2030-2031)	-	-	-	-	113.5	75.7	189.2
Replace Terminal Station Battery Banks and Chargers (2031-2032)	-	-	-	-	-	409.5	409.5
Replace Two 129 V Chargers - Stage 2 (2029-2030) - Holyrood	-	-	-	100.0	75.0	-	175.0
Section Replacement and Weld Refurbishment Penstock 2 - Bay d'Espoir							80,494.3
Section Replacement and Weld Refurbishment Penstock 3 - Bay d'Espoir							78,119.3
Station Service Switchboard Replacement Powerhouse 1 (2028-2030) - Bay d'Espoir	-	-	150.0	1,000.0	500.0	-	1,650.0
Supply and Install Runner - Unit 2 (2026-2028) - Cat Arm	582.2	1,634.6	2,620.1	-	-	-	4,836.9
Terminal Station In-Service Failures (2027)	-	2,203.3	-	-	-	-	2,203.3
Terminal Station In-service Failures (2028)	-	-	2,223.9	-	-	-	2,223.9
Terminal Station In-service Failures (2029)	-	-	-	2,289.2	-	-	2,289.2
Terminal Station In-service Failures (2030)	-	-	-	-	2,350.7	-	2,350.7
Terminal Station In-service Failures (2031)	-	-	-	-	-	2,413.8	2,413.8
Thermal In-Service Failures (2027)	-	3,836.4	-	-	-	-	3,836.4
Thermal In-Service Failures (2028)	-	-	3,881.0	-	-	-	3,881.0
Thermal In-Service Failures (2029)	-	-	-	3,981.0	-	-	3,981.0
Thermal In-Service Failures (2030)	-	-	-	-	700.0	-	700.0
Transmission In-Service Failures (2027)	-	194.5	-	-	-	-	194.5

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	2026 and Prior Years	2027	2028	2029	2030	2031	Total
Transmission In-Service Failures (2028)	-	-	198.7	-	-	-	198.7
Transmission In-Service Failures (2029)	-	-	-	206.0	-	-	206.0
Transmission In-Service Failures (2030)	-	-	-	-	213.1	-	213.1
Transmission In-Service Failures (2031)	-	-	-	-	-	220.5	220.5
Unit 7 Life Extension - Bay d'Espoir	[redacted]						66,264.2
Units 1-6 Spherical Valve Refurbishment (2028-2033) - Bay d'Espoir	-	-	1,500.0	1,500.0	1,500.0	1,500.0	6,000.0
Upgrade Data Alarm Systems (2029-2030) - Springdale	-	-	-	19.0	35.6	-	54.5
Upgrade Exciter and Transformer - Unit 3 (2029) - Holyrood	-	-	-	4,000.0	-	-	4,000.0
Upgrade Power Transformers (2026–2027)	1,705.0	401.8	-	-	-	-	2,106.8
Upgrade Power Transformers (2027–2028)	-	518.1	766.2	-	-	-	1,284.3
Upgrade Power Transformers (2028-2029)	-	-	86.9	2,561.0	-	-	2,647.9
Upgrade Power Transformers (2029-2030)	-	-	-	69.9	1,980.4	-	2,050.3
Upgrade Power Transformers (2030-2031)	-	-	-	-	51.9	1,061.5	1,113.4
Upgrade Power Transformers (2031-2032)	-	-	-	-	-	53.3	53.3
Upgrade Spherical Valve Controls (2026-2029) - Bay d'Espoir	314.9	219.6	358.3	460.3	-	-	1,353.1
Wood Pole Line Management (2027)	-	7,998.0	-	-	-	-	7,998.0
Wood Pole Line Management (2028)	-	-	8,451.0	-	-	-	8,451.0
Wood Pole Line Management (2029)	-	-	-	8,100.0	-	-	8,100.0
Wood Pole Line Management (2030)	-	-	-	-	8,629.0	-	8,629.0
Wood Pole Line Management (2031)	-	-	-	-	-	10,060.0	10,060.0
Renewal Total	**31,319.5**	**179,327.0**	**188,908.8**	**173,768.2**	**133,961.2**	**71,462.1**	**778,746.7**
Service Enhancement							
Distribution Equipment SCADA Additions - Phase I (2027-2028)	-	548.8	822.0	-	-	-	1,370.8
Distribution Equipment SCADA Additions (2028-2029)	-	-	562.8	832.6	-	-	1,395.4
Distribution Equipment SCADA Additions (2029-2030)	-	-	-	579.5	857.4	-	1,436.9
Distribution Equipment SCADA Additions (2030-2031)	-	-	-	-	595.3	880.7	1,476.0
Distribution Equipment SCADA Additions (2031-2032)	-	-	-	-	-	611.5	611.5
Install Intelligent Electronic Device Management (2029-2030)	-	-	-	541.0	551.8	-	1,092.8
Install Intelligent Electronic Device Management (2031-2032)	-	-	-	-	-	563.0	563.0
Install Intelligent Electronic Devices Management Software (2026-2028)	297.2	675.4	297.6	-	-	-	1,270.2
Purchase Spare Generator Step Up Transformer (2023-2028)	1,014.2	4,313.0	6,996.8	-	-	-	12,324.0
Relocate Section of Line (2026-2028) - TL220	79.7	2,970.7	1,041.0	-	-	-	4,091.4
Remove Safety Hazards (2027)	-	310.8	-	-	-	-	310.8
Remove Safety Hazards (2028)	-	-	248.5	-	-	-	248.5
Remove Safety Hazards (2029)	-	-	-	252.9	-	-	252.9
Remove Safety Hazards (2030)	-	-	-	-	257.3	-	257.3
Remove Safety Hazards (2031)	-	-	-	-	-	280.0	280.0
Replace Diesel Plant (2028-2031) - Rigolet	-	-	5,000.0	10,000.0	10,000.0	10,000.0	35,000.0
Replace Expansion Joint and Rock Scaling (2026-2027) - Paradise River	516.9	230.4	-	-	-	-	747.3
Upgrade Blackstart Diesel Instrumentation (2027-2028) - Holyrood	-	234.2	203.9	-	-	-	438.1
Upgrade Cooling (2026-2027) - Hardwoods	100.6	344.5	-	-	-	-	445.1
Upgrade Excitation System (2026-2027) - Paradise River	218.7	203.5	-	-	-	-	422.2
Upgrade Terminal Station for Mobile Substation (2026-2027) - St. Anthony Diesel	66.1	328.6	-	-	-	-	394.7
Upgrade Terminal Station for Mobile Substation (2027-2028) - Glenburnie	-	78.2	330.2	-	-	-	408.4
Upgrade Terminal Station for Mobile Substation (2028-2029) - Roddickton	-	-	89.6	536.2	-	-	625.8
Upgrade Terminal Station for Mobile Substation (2029-2030) - Grandy Brook	-	-	-	94.7	565.2	-	659.9
Upgrade Worst-Performing Distribution Feeders (2025-2027)	6,356.3	2,529.8	-	-	-	-	8,886.1
Upgrade Worst-Performing Distribution Feeders (2026-2027)	756.3	3,534.9	-	-	-	-	4,291.2
Upgrade Worst-Performing Distribution Feeders (2027–2028)	-	176.3	3,388.8	-	-	-	3,565.1
Upgrade Worst-Performing Distribution Feeders (2028-2029)	-	-	179.0	3,370.7	-	-	3,549.7
Upgrade Worst-Performing Distribution Feeders (2029-2030)	-	-	-	184.3	3,471.0	-	3,655.3
Upgrade Worst-Performing Distribution Feeders (2030-2031)	-	-	-	-	189.3	3,565.6	3,754.9
Upgrade Worst-Performing Distribution Feeders (2031-2032)	-	-	-	-	-	194.5	194.5
Service Enhancement Total	**9,406.0**	**16,479.1**	**19,160.2**	**16,391.9**	**16,487.3**	**16,095.3**	**94,019.9**
System Growth							
Additions for Load - Cartwright (2024-2027)	21.5	486.3	-	-	-	-	507.8
Additions for Load (2028) - Distribution System	-	-	814.9	-	-	-	814.9
Additions for Load (2029) - Distribution System	-	-	-	836.8	-	-	836.8
Additions for Load (2030) - Distribution System	-	-	-	-	859.2	-	859.2
Additions for Load (2031) - Distribution System	-	-	-	-	-	882.2	882.2
Additions for Load Growth - Unit 2065 Replacement and Fuel Storage Upgrades (2024-2027) - Rigolet	3,359.4	484.5	-	-	-	-	3,843.9
Additions for Load Growth - Upgrade Fuel Storage (2027) - Cartwright	-	442.7	-	-	-	-	442.7
Additions for Load Growth - Upgrade Fuel Storage (2030-2031) - Nain	-	-	-	-	500.0	2,500.0	3,000.0
Additions for Load Growth - Upgrade Terminal Station (2027-2030) - Jean Lake	-	2,830.2	10,819.5	9,447.8	4,271.4	-	27,368.9
Additions for Load Growth (2028) - Isolated Generation Stations	-	-	967.1	-	-	-	967.1
Additions for Load Growth (2029) - Isolated Generation Stations	-	-	-	992.2	-	-	992.2
Additions for Load Growth (2030) - Isolated Generation Stations	-	-	-	-	1,015.4	-	1,015.4
Additions for Load Growth (2031) - Isolated Generation Stations	-	-	-	-	-	1,039.2	1,039.2
Avalon Combustion Turbine	[redacted]						995,875.2
Installation of Bay d'Espoir Unit 8	[redacted]						1,050,553.8
Upgrade Distribution System - Belleoram Quarry (2026-2027) - English Harbour West	2,559.1	691.6	-	-	-	-	3,250.7
Upgrade Transformers (2028-2030) - Sunnyside and Stony Brook	-	-	392.4	5,218.4	28,593.6	-	34,204.4
System Growth Total	**135,318.9**	**291,575.8**	**618,265.3**	**592,607.7**	**329,690.7**	**158,995.9**	**2,126,454.2**
Total Capital Plan	**196,284.4**	**545,598.3**	**896,493.8**	**846,942.9**	**526,394.0**	**289,234.4**	**3,300,947.7**

[1] Numbers may not add due to rounding.

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	2026 and Prior Years	2027	2028	2029	2030	2031	Total
Allowance for Unforeseen Items							
Allowance for Unforeseen Items							
Allowance for Unforeseen Items (2027)	-	1,000.0	-	-	-	-	1,000.0
Allowance for Unforeseen Items (2028)	-	-	1,000.0	-	-	-	1,000.0
Allowance for Unforeseen Items (2029)	-	-	-	1,000.0	-	-	1,000.0
Allowance for Unforeseen Items (2030)	-	-	-	-	1,000.0	-	1,000.0
Allowance for Unforeseen Items (2031)	-	-	-	-	-	1,000.0	1,000.0
Allowance for Unforeseen Items Total	**-**	**1,000.0**	**1,000.0**	**1,000.0**	**1,000.0**	**1,000.0**	**5,000.0**
Allowance for Unforeseen Items Total	**-**	**1,000.0**	**1,000.0**	**1,000.0**	**1,000.0**	**1,000.0**	**5,000.0**
General Properties							
Administration							
Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2027)	-	992.4	-	-	-	-	992.4
Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2028)	-	-	577.5	-	-	-	577.5
Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2029)	-	-	-	589.3	-	-	589.3
Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2030)	-	-	-	-	599.8	-	599.8
Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2031)	-	-	-	-	-	610.6	610.6
Perform Accessibility Upgrades (2027)	-	555.3	-	-	-	-	555.3
Perform Accessibility Upgrades (2028)	-	-	264.4	-	-	-	264.4
Perform Accessibility Upgrades (2029)	-	-	-	269.0	-	-	269.0
Perform Accessibility Upgrades (2030)	-	-	-	-	273.7	-	273.7
Perform Accessibility Upgrades (2031)	-	-	-	-	-	278.7	278.7
Remove Safety Hazards (2027)	-	310.8	-	-	-	-	310.8
Remove Safety Hazards (2028)	-	-	248.5	-	-	-	248.5
Remove Safety Hazards (2029)	-	-	-	252.9	-	-	252.9
Remove Safety Hazards (2030)	-	-	-	-	257.3	-	257.3
Remove Safety Hazards (2031)	-	-	-	-	-	280.0	280.0
Administration Total	**-**	**1,858.5**	**1,090.4**	**1,111.2**	**1,130.9**	**1,169.3**	**6,360.3**
Information Systems							
Augmented Reality / Virtual Reality Rollout (2028)	-	-	557.0	-	-	-	557.0
Clarity Replacement (2027)	-	474.6	-	-	-	-	474.6
Implement Configuration Management Database (2028-2029)	-	-	621.1	200.0	-	-	821.1
Implement Meter Management System (2028)	-	-	500.0		-	-	500.0
Implement Performance Management System (2028-2029)	-	-	250.0	350.0	-	-	600.0
Implement Recruitment System (2028-2029)	-	-	100.0	550.0	-	-	650.0
Microsoft Enterprise Agreement (2028-2030)	-	-	627.2	597.2	597.2	-	1,821.7
Microsoft Enterprise Agreement (2031-2033)	-	-	-	-	-	627.1	627.1
Microsoft Enterprise Agreement (2025-2027)	426.6	426.6	426.6	-	-	-	1,279.9
Migrate Legacy Applications (2027)	-	988.2	-	-	-	-	988.2
Migrate Legacy Applications (2028)	-	-	998.2	-	-	-	998.2
Perform Software Upgrades and Minor Enhancements - Information Technology (2026-2027)	649.9	1,097.2	-	-	-	-	1,747.1
Perform Software Upgrades and Minor Enhancements - Information Technology (2027-2028)	-	1,298.0	249.4	-	-	-	1,547.4
Perform Software Upgrades and Minor Enhancements - Information Technology (2028-2029)	-	-	1,383.3	210.0	-	-	1,593.3
Perform Software Upgrades and Minor Enhancements - Information Technology (2029-2030)	-	-	-	1,035.7	632.1	-	1,667.8
Perform Software Upgrades and Minor Enhancements - Information Technology (2030-2031)	-	-	-	-	1,247.2	410.0	1,657.2
Perform Software Upgrades and Minor Enhancements - Information Technology (2031-2032)	-	-	-	-	-	1,496.8	1,496.8
Perform Software Upgrades and Minor Enhancements - Operational Technology (2027)	-	274.8	-	-	-	-	274.8
Perform Software Upgrades and Minor Enhancements - Operational Technology (2028)	-	-	250.0	-	-	-	250.0
Perform Software Upgrades and Minor Enhancements - Operational Technology (2029)	-	-	-	350.0	-	-	350.0
Perform Software Upgrades and Minor Enhancements - Operational Technology (2030)	-	-	-	-	275.0	-	275.0
Perform Software Upgrades and Minor Enhancements - Operational Technology (2031)	-	-	-	-	-	325.0	325.0
Purchase Mobile Devices (2027)	-	327.0	-	-	-	-	327.0
Purchase Mobile Devices (2028)	-	-	166.0	-	-	-	166.0
Purchase Mobile Devices (2029)	-	-	-	336.5	-	-	336.5
Purchase Mobile Devices (2030)	-	-	-	-	352.3	-	352.3
Purchase Mobile Devices (2031)	-	-	-	-	-	182.1	182.1
Purchase Personal Computers (2027)	-	1,649.6	-	-	-	-	1,649.6
Purchase Personal Computers (2028)	-	-	770.0	-	-	-	770.0
Purchase Personal Computers (2029)	-	-	-	1,250.0	-	-	1,250.0
Purchase Personal Computers (2030)	-	-	-	-	1,080.0	-	1,080.0
Purchase Personal Computers (2031)	-	-	-	-	-	1,350.0	1,350.0
Replace GRID Application (2026-2027)	134.9	363.9	-	-	-	-	498.8
Replace Peripheral Infrastructure (2027)	-	461.8	-	-	-	-	461.8
Replace Peripheral Infrastructure (2028)	-	-	203.0	-	-	-	203.0
Replace Peripheral Infrastructure (2029)	-	-	-	189.1	-	-	189.1
Replace Peripheral Infrastructure (2030)	-	-	-	-	538.3	-	538.3
Replace Peripheral Infrastructure (2031)	-	-	-	-	-	327.3	327.3
SWOP Replacement (2027-2028)	-	1,053.9	455.8	-	-	-	1,509.7
Update Cybersecurity Infrastructure (2027)	-	342.6	-	-	-	-	342.6
Update Cybersecurity Infrastructure (2028)	-	-	575.0	-	-	-	575.0
Update Cybersecurity Infrastructure (2029)	-	-	-	592.0	-	-	592.0
Update Cybersecurity Infrastructure (2030)	-	-	-	-	600.0	-	600.0
Update Cybersecurity Infrastructure (2031)	-	-	-	-	-	611.2	611.2
Upgrade Core Information Technology Infrastructure (2027)	-	2,909.4	-	-	-	-	2,909.4
Upgrade Core Information Technology Infrastructure (2028)	-	-	2,919.0	-	-	-	2,919.0
Upgrade Core Information Technology Infrastructure (2029)	-	-	-	2,165.0	-	-	2,165.0
Upgrade Core Information Technology Infrastructure (2030)	-	-	-	-	1,535.0	-	1,535.0
Upgrade Core Information Technology Infrastructure (2031)	-	-	-	-	-	1,567.5	1,567.5
Upgrade Core IT Infrastructure (2026-2027)	871.6	522.9	-	-	-	-	1,394.5
Upgrade Core Operational Technology Infrastructure (2027)	-	561.2	-	-	-	-	561.2
Upgrade Core Operational Technology Infrastructure (2028)	-	-	950.0	-	-	-	950.0
Upgrade Core Operational Technology Infrastructure (2029)	-	-	-	425.0	-	-	425.0
Upgrade Core Operational Technology Infrastructure (2030)	-	-	-	-	450.0	-	450.0
Upgrade Core Operational Technology Infrastructure (2031)	-	-	-	-	-	650.0	650.0
Upgrade Energy Management System (2027-2028)	-	375.9	385.8	-	-	-	761.7
Upgrade Energy Management System (2029-2030)	-	-	-	397.9	415.7	-	813.6
Upgrade Energy Management System (2031-2032)	-	-	-	-	-	412.3	412.3
Utiligy Replacement (2028-2030)	-	-	1,300.0	2,500.0	1,500.0	-	5,300.0
Information Systems Total	**2,083.1**	**13,127.6**	**13,687.4**	**11,148.4**	**9,222.9**	**7,959.3**	**57,228.7**

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Five-Year Capital Plan Detailed Breakdown by Major and Minor - Asset Category[1]
($000)

	2026 and Prior Years	2027	2028	2029	2030	2031	Total
Properties							
Install Electric Vehicle Chargers (2027-2028) - Hydro Sites	-	274.5	326.1	-	-	-	600.6
Install Electric Vehicle Chargers (2028-2029) - Hydro Sites	-	-	278.8	326.3	-	-	605.1
Install Electric Vehicle Chargers (2029-2030) - Hydro Sites	-	-	-	284.5	332.2	-	616.7
Install Electric Vehicle Chargers (2030-2031) - Hydro Sites	-	-	-	-	289.6	338.1	627.7
Install Electric Vehicle Chargers (2031-2032) - Hydro Sites	-	-	-	-	-	294.8	294.8
Perform Facilities Refurbishments (2027)	-	1,470.2	-	-	-	-	1,470.2
Perform Facilities Refurbishments (2028)	-	-	2,000.0	-	-	-	2,000.0
Perform Facilities Refurbishments (2029)	-	-	-	2,000.0	-	-	2,000.0
Perform Facilities Refurbishments (2030)	-	-	-	-	2,000.0	-	2,000.0
Perform Facilities Refurbishments (2031)	-	-	-	-	-	2,000.0	2,000.0
Procure Accommodations (2027) - Postville	-	732.5	-	-	-	-	732.5
Procure Accommodations (2028) - Labrador	-	-	738.7	-	-	-	738.7
Procure Accommodations (2029) - Labrador	-	-	-	753.8	-	-	753.8
Procure Accommodations (2030) - Labrador	-	-	-	-	767.3	-	767.3
Procure Accommodations (2031) - Labrador	-	-	-	-	-	781.0	781.0
Refurbish Middle and Upper Parking Lots (2028-2029) - Hydro Place	-	-	750.0	1,000.0	-	-	1,750.0
Refurbish Storm Sewer System (2028-2031) - Bishop's Falls	-	-	560.0	315.0	565.0	245.0	1,685.0
Renew Property, Grounds and Infrastructure (2028)	-	-	737.1	-	-	-	737.1
Renew Property, Grounds and Infrastructure (2029)	-	-	-	61.0	-	-	61.0
Renew Property, Grounds and Infrastructure (2030)	-	-	-	-	460.0	-	460.0
Renew Property, Grounds and Infrastructure (2031)	-	-	-	-	-	740.0	740.0
Replace Burnt Dam Septic System (2028-2029) - Bay d'Espoir	-	-	75.0	250.0	-	-	325.0
Replace Diesel Shop (2028-2029) - Bishop's Falls	-	-	1,422.0	889.9	-	-	2,311.9
Replace Diesel Shop (2028-2029) - Goose Bay	-	-	500.0	1,500.0	-	-	2,000.0
Replace Powerhouse 2 Roof (2028-2029) - Bay d'Espoir	-	-	100.0	960.0	-	-	1,060.0
Replace Powerhouse Roof (2029-2030) - Cat Arm	-	-	-	100.0	1,500.0	-	1,600.0
Replace Powerhouse Roof (2030 -2031) - Upper Salmon	-	-	-	-	150.0	1,250.0	1,400.0
Replace Roof (2026-2027) - Hopedale	190.6	1,791.0	-	-	-	-	1,981.6
Replace Roof (2027-2028) - Cartwright	-	214.5	1,254.2	-	-	-	1,468.7
Replace/Upgrade IS Server Room Fire Suppression System (2028) - Hydro Place	-	-	578.1	-	-	-	578.1
Upgrade Line Depot (2027-2029) - Bay d'Espoir	-	470.6	1,811.7	3,918.4	-	-	6,200.7
Properties Total	**190.6**	**4,953.3**	**11,131.7**	**12,358.9**	**6,064.1**	**5,648.9**	**40,347.5**
Telecontrol							
Install CCTV Systems (2027)	-	553.3	-	-	-	-	553.3
Install CCTV Systems (2028)	-	-	477.6	-	-	-	477.6
Install CCTV Systems (2029)	-	-	-	491.9	-	-	491.9
Install CCTV Systems (2030)	-	-	-	-	506.7	-	506.7
Install CCTV Systems (2031)	-	-	-	-	-	521.9	521.9
Install Intelligent Electronic Device Management (2029-2030)	-	-	-	541.0	551.8	-	1,092.8
Install Intelligent Electronic Device Management (2031-2032)	-	-	-	-	-	563.0	563.0
Install Intelligent Electronic Devices Management Software (2026-2028)	297.2	675.4	297.6	-	-	-	1,270.2
Perform Minor Telecommunications Enhancements (2027)	-	157.1	-	-	-	-	157.1
Perform Minor Telecommunications Enhancements (2028)	-	-	163.0	-	-	-	163.0
Perform Minor Telecommunications Enhancements (2029)	-	-	-	166.3	-	-	166.3
Perform Minor Telecommunications Enhancements (2030)	-	-	-	-	169.3	-	169.3
Perform Minor Telecommunications Enhancements (2031)	-	-	-	-	-	172.3	172.3
Refurbish Meteorological Stations - Phase 2 (2026-2027)	528.1	167.4	-	-	-	-	695.5
Replace 48 V Battery Banks and Chargers (2026-2027)	250.1	524.4	-	-	-	-	774.5
Replace 48 V Battery Banks and Chargers (2027-2028)	-	52.3	428.9	-	-	-	481.2
Replace 48 V Battery Banks and Chargers (2028-2029)	-	-	103.0	484.0	-	-	587.0
Replace 48 V Battery Banks and Chargers (2029-2030)	-	-	-	106.1	498.4	-	604.5
Replace 48 V Battery Banks and Chargers (2030-2031)	-	-	-	-	109.3	513.4	622.7
Replace 48 V Battery Banks and Chargers (2031-2032)	-	-	-	-	-	112.6	112.6
Replace Back-up Generators (2028-2029) - Microwave Repeater Sites (East)	-	-	100.3	415.1	-	-	515.4
Replace Back-up Generators at Microwave Repeater Sites (2026-2027)	94.5	391.3	-	-	-	-	485.8
Replace Cisco Call Manager Appliances (2027)	-	213.5	-	-	-	-	213.5
Replace Cycle Charge System (2029-2030) - Gull Pond Hill	-	-	-	75.0	250.0	-	325.0
Replace Network Communications Equipment (2026-2027)	1,038.4	99.0	-	-	-	-	1,137.4
Replace Network Communications Equipment (2027-2028)	-	624.6	63.6	-	-	-	688.2
Replace Network Communications Equipment (2028-2029)	-	-	1,100.0	102.0	-	-	1,202.0
Replace Network Communications Equipment (2029-2030)	-	-	-	1,200.0	105.0	-	1,305.0
Replace Network Communications Equipment (2030-2031)	-	-	-	-	400.0	50.0	450.0
Replace Network Communications Equipment (2031-2032)	-	-	-	-	-	500.0	500.0
Replace Power Line Carrier (2027-2029) - TL212	-	154.9	1,552.7	419.1	-	-	2,126.7
Replace Radio Link to Hydraulic Control Structure (2026-2027) - Ebbegunbaeg	470.5	756.8	-	-	-	-	1,227.3
Replace Remote Terminal Unit Interface Boards (2028-2030)	-		350.0	350.0	350.0	-	1,050.0
Replace Simple Network Management Protocol Alarm Encoders (2028-2030)	-		200.0	350.0	350.0	-	900.0
Replace Teleprotection Equipment (2026-2028)	964.4	310.6	224.8	-	-	-	1,499.8
Telecommunications In-Service Failures (2027)	-	118.8	-	-	-	-	118.8
Telecommunications In-Service Failures (2028)	-	-	127.7	-	-	-	127.7
Telecommunications In-Service Failures (2029)	-	-	-	130.0	-	-	130.0
Telecommunications In-Service Failures (2030)	-	-	-	-	132.2	-	132.2
Telecommunications In-Service Failures (2031)	-	-	-	-	-	137.6	137.6
Telecontrol Total	**3,643.2**	**4,799.4**	**5,189.2**	**4,830.5**	**3,422.7**	**2,570.8**	**24,455.8**
Tools and Equipment							
Purchase Tools and Equipment (2027)	-	2,176.0	-	-	-	-	2,176.0
Purchase Tools and Equipment (2028)	-	-	2,218.2	-	-	-	2,218.2
Purchase Tools and Equipment (2029)	-	-	-	2,263.5	-	-	2,263.5
Purchase Tools and Equipment (2030)	-	-	-	-	2,304.0	-	2,304.0
Purchase Tools and Equipment (2031)	-	-	-	-	-	2,345.2	2,345.2
Replace Heavy-Duty Mobile Equipment (2028-2029)	-	-	2,615.2	1,134.7	-	-	3,749.9
Replace Heavy-Duty Mobile Equipment (2029-2030)	-	-	-	1,434.3	1,086.1	-	2,520.4
Replace Heavy-Duty Mobile Equipment (2030-2031)	-	-	-	-	1,698.1	1,383.0	3,081.1
Replace Heavy-Duty Mobile Equipment (2031-2032)	-	-	-	-	-	1,244.8	1,244.8
Replace Light-Duty Mobile Equipment (2028)	-	-	1,091.3	-	-	-	1,091.3
Replace Light-Duty Mobile Equipment (2029)	-	-	-	1,285.0	-	-	1,285.0
Replace Light-Duty Mobile Equipment (2030)	-	-	-	-	1,443.8	-	1,443.8
Replace Light-Duty Mobile Equipment (2031)	-	-	-	-	-	1,476.3	1,476.3
Tools and Equipment Total	**-**	**2,176.0**	**5,924.7**	**6,117.5**	**6,532.0**	**6,449.3**	**27,199.5**

Newfoundland and Labrador Hydro
2027 Capital Budget Application
Five-Year Capital Plan Detailed Breakdown by Major and Minor - Asset Category[1]
($000)

	2026 and Prior Years	2027	2028	2029	2030	2031	Total
Transportation							
Replace Heavy-Duty Vehicles (2026-2028)	1,524.1	788.5	2,204.4	-	-	-	4,517.0
Replace Heavy-Duty Vehicles (2027-2029)	-	835.4	1,303.3	1,309.2	-	-	3,447.9
Replace Heavy-Duty Vehicles (2028-2029)	-	-	2,121.4	2,125.5	-	-	4,246.9
Replace Heavy-Duty Vehicles (2029-2031)	-	-	-	782.4	1,327.5	2,702.5	4,812.4
Replace Heavy-Duty Vehicles (2030-2031)	-	-	-	-	929.1	1,924.8	2,853.9
Replace Heavy-Duty Vehicles (2031-2033)	-	-	-	-	-	1,661.6	1,661.6
Replace Light- and Heavy-Duty Vehicles (2025-2027)	4,390.4	3,447.2	-	-	-	-	7,837.6
Replace Light-Duty Vehicles (2026-2027)	2,547.5	548.6	-	-	-	-	3,096.1
Replace Light-Duty Vehicles (2027-2028)	-	3,125.9	701.6	-	-	-	3,827.5
Replace Light-Duty Vehicles (2028-2029)	-	-	3,083.0	358.9	-	-	3,441.9
Replace Light-Duty Vehicles (2029-2030)	-	-	-	3,334.3	398.6	-	3,732.9
Replace Light-Duty Vehicles (2030-2031)	-	-	-	-	3,055.7	412.5	3,468.2
Replace Light-Duty Vehicles (2031-2032)	-	-	-	-	-	3,381.4	3,381.4
Transportation Total	**8,462.0**	**8,745.6**	**9,413.7**	**7,910.3**	**5,710.9**	**10,082.8**	**50,325.3**
General Properties Total	**14,378.9**	**35,660.4**	**46,437.1**	**43,476.8**	**32,083.5**	**33,880.4**	**205,917.1**
Generation							
Combustion Turbines							
Avalon Combustion Turbine	[redacted]						995,875.2
Combustion Turbine In-Service Failures (2027)	-	1,038.0	-	-	-	-	1,038.0
Combustion Turbine In-Service Failures (2028)	-	-	1,059.1	-	-	-	1,059.1
Combustion Turbine In-Service Failures (2029)	-	-	-	1,086.5	-	-	1,086.5
Combustion Turbine In-Service Failures (2030)	-	-	-	-	1,112.0	-	1,112.0
Combustion Turbine In-Service Failures (2031)	-	-	-	-	-	1,138.1	1,138.1
Inspect Fuel Storage Tanks (2030) - Holyrood	-	-	-	-	650.0	-	650.0
Major Combustion Turbine Overhaul (2027–2029) - Holyrood	[redacted]						78,194.3
Overhaul Main Enclosure (2027) - Stephenville	-	975.4	-	-	-	-	975.4
Refurbish Air Intake (2031-2032) - Happy Valley	-	-	-	-	-	200.0	200.0
Replace 125VDC Battery Bank (2026-2027) - Hardwoods	108.9	37.8	-	-	-	-	146.7
Replace Air Dryer (2026-2027) - Hardwoods	75.2	198.0	-	-	-	-	273.2
Replace Control System (2029-2030) - Holyrood	-	-	-	100.0	400.0	-	500.0
Replace DC Fuel Pump (2026-2027) - Hardwoods	90.4	58.4	-	-	-	-	148.8
Replace Fuel Oil Water Injection Pumps (2029) - Holyrood	-	-	-	300.0	-	-	300.0
Replace Generator Protection (2028-2029) - Holyrood	-	-	100.0	150.0	-	-	250.0
Replace Glycol Cooler Coil (2031-2032) - Happy Valley	-	-	-	-	-	50.0	50.0
Upgrade Blackstart Diesel Instrumentation (2027-2028) - Holyrood	-	234.2	203.9	-	-	-	438.1
Upgrade Cooling (2026-2027) - Hardwoods	100.6	344.5	-	-	-	-	445.1
Combustion Turbines Total	[redacted]	**223,037.1**	**388,892.7**	**328,852.0**	[redacted]	**1,388.1**	**1,089,880.5**
Hydraulic Plant							
Discharge Ring Machining and Turbine Refurbishment (2028-2029) - Upper Salmon	-	-	1,500.0	7,500.0	-	-	9,000.0
Fabricate and Install Stoplog Racks (2026-2027) - Bay d'Espoir	85.0	659.1	-	-	-	-	744.1
Hydraulic In-Service Failures (2027)	-	3,353.5	-	-	-	-	3,353.5
Hydraulic In-Service Failures (2028)	-	-	3,379.4	-	-	-	3,379.4
Hydraulic In-Service Failures (2029)	-	-	-	3,455.0	-	-	3,455.0
Hydraulic In-Service Failures (2030)	-	-	-	-	3,523.7	-	3,523.7
Hydraulic In-Service Failures (2031)	-	-	-	-	-	3,593.7	3,593.7
Installation of Bay d'Espoir Unit 8	[redacted]						1,050,553.8
Overhaul Hydraulic Units (2027)	-	4,436.5	-	-	-	-	4,436.5
Overhaul Hydraulic Units (2028)	-	-	3,897.9	-	-	-	3,897.9
Overhaul Hydraulic Units (2029)	-	-	-	500.0	-	-	500.0
Overhaul Hydraulic Units (2030)	-	-	-	-	1,350.0	-	1,350.0
Overhaul Hydraulic Units (2031)	-	-	-	-	-	1,300.0	1,300.0
Overhaul Spherical Valves Unit 1 and 2 (2031-2032) - Cat Arm	-	-	-	-	-	250.0	250.0
Perform Dam Infrastructure Refurbishments (2027)	-	526.3	-	-	-	-	526.3
Perform Dam Infrastructure Refurbishments (2028)	-	-	505.0	-	-	-	505.0
Perform Dam Infrastructure Refurbishments (2029)	-	-	-	505.0	-	-	505.0
Perform Dam Infrastructure Refurbishments (2030)	-	-	-	-	505.0	-	505.0
Perform Dam Infrastructure Refurbishments (2031)	-	-	-	-	-	505.0	505.0
Perform Level 2 Condition Assessment - Turbine and Generator (2028) - Cat Arm	-	-	500.0	-	-	-	500.0
Perform Level 2 Condition Assessment - Intake (2029) - Upper Salmon	-	-	-	250.0	-	-	250.0
Perform Level 2 Condition Assessment - Penstock (2029) - Upper Salmon	-	-	-	200.0	-	-	200.0
Perform Level 2 Condition Assessment - Penstock (2030) - Granite Canal	-	-	-	-	200.0	-	200.0
Perform Level 2 Condition Assessment - Spillway (2029) - Hinds Lake	-	-	-	450.0	-	-	450.0
Perform Level 2 Condition Assessment - Station Service (2029) - Hinds Lake		-	-	200.0	-	-	200.0
Perform Level 2 Condition Assessment - Station Service (2029) - Paradise River	-	-	-	200.0	-	-	200.0
Perform Level 2 Condition Assessment - Station Service (2030) - Cat Arm	-	-	-	-	200.0	-	200.0
Perform Level 2 Condition Assessment - Steel Section (2027) - Paradise River		174.0	-	-	-	-	174.0
Perform Level 2 Condition Assessment - West Salmon Spillway (2027-2028) - Upper Salmon	-	639.5	29.6	-	-	-	669.1
Refurbish Draft Tube Deck - Phase 3 (2027-2029) - Bay d'Espoir	-	159.6	806.0	839.4	-	-	1,805.0
Refurbish Generator (2030-2032) - Upper Salmon	-	-	-	-	500.0	5,000.0	5,500.0
Refurbish Intake 4 (2026-2028) - Bay d'Espoir	284.4	3,069.4	3,069.4	-	-	-	6,423.2
Refurbish Intake Access Road (2027-2028) - Bay d'Espoir	-	465.0	2,796.8	-	-	-	3,261.8
Refurbish MD-1 (2027-2030) - Ebbegunbaeg	-	665.8	1,919.1	3,312.4	5,137.5	-	11,034.8
Refurbish Phase 1 Exterior Precast Concrete Panel - Powerhouse 1 (2028-2029) - Bay d'Espoir	-	-	100.0	1,459.6	-	-	1,559.6
Refurbish Rip Rap - CD4 (2028-2029) - Cat Arm	-	-	150.0	1,500.0	-	-	1,650.0
Refurbish Spillway (2028-2030) - North Salmon Spillway	-	-	500.0	1,500.0	1,500.0	-	3,500.0
Refurbish Spillway (2030-2032) - West Salmon Spillway	-	-	-	-	500.0	1,500.0	2,000.0
Refurbish Spillway (2031-2033) - Hinds Lake	-	-	-	-	-	500.0	500.0
Refurbish Structure (2027-2031) - Salmon River Spillway	[redacted]						40,322.0
Refurbish Turbine (2030-2032) - Hinds Lake	-	-	-	-	500.0	7,500.0	8,000.0
Replace Annunciator Panel (2027-2028) Upper Salmon	-	141.3	242.9	-	-	-	384.2
Replace Battery Bank (2026-2027) - Granite Canal	138.8	44.2	-	-	-	-	183.0
Replace Battery Bank 1 – Powerhouse 1 (2031-2032) – Bay d'Espoir	-	-	-	-	-	100.0	100.0
Replace Battery Bank 1 (2030-2031) - Cat Arm	-	-	-	-	100.0	150.0	250.0
Replace Battery Bank 1 and 2 - Powerhouse 1 (2028-2029) - Bay d'Espoir	-	-	200.0	300.0	-	-	500.0
Replace Battery Bank 1 and 2 (2028-2029) - Hinds Lake	-	-	200.0	300.0	-	-	500.0
Replace Battery Bank 2 (2031-2032) - Upper Salmon	-	-	-	-	-	100.0	100.0
Replace Controllers (2028-2030) - Granite Canal	-	-	1,250.0	1,250.0	1,250.0	-	3,750.0
Replace Diesel Gensets (2027–2029) - Burnt Dam Spillway	-	475.6	1,409.1	107.4	-	-	1,992.1
Replace Emergency Diesel Genset (2025-2027) - Cat Arm	1,487.3	-	-	-	-	-	1,487.3
Replace Expansion Joint and Rock Scaling (2026-2027) - Paradise River	516.9	230.4	-	-	-	-	747.3
Replace Gasoline Tank (2030-2031) - Cat Arm	-	-	-	-	25.0	75.0	100.0
Replace Governor (2031-2032) - Hinds Lake	-	-	-	-	-	500.0	500.0

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	2026 and Prior Years	2027	2028	2029	2030	2031	Total
Replace Hydraulic Lift Pump (2027-2028) - Burnt Dam	-	89.3	160.7	-	-	-	250.0
Replace Hydraulic Lift Pump (2030-2032) - Paradise River	-	-	-	-	250.0	500.0	750.0
Replace Hydraulic Lift Pump (2031-2033) - Upper Salmon	-	-	-	-	-	250.0	250.0
Replace Rip Rap on LD-5 (2027) - Salmon River Spillway	-	719.6	-	-	-	-	719.6
Replace Walkway to Toe of Dam (2026-2027) - Paradise River	16.8	566.1	-	-	-	-	582.9
Section Replacement and Weld Refurbishment Penstock 2 - Bay d'Espoir	[redacted]						80,494.3
Section Replacement and Weld Refurbishment Penstock 3 - Bay d'Espoir	[redacted]						78,119.3
Stabilize Powerhouse Slope (2027) - Cat Arm	-	1,729.8	-	-	-	-	1,729.8
Station Service Switchboard Replacement Powerhouse 1 (2028-2030) - Bay d'Espoir	-	-	150.0	1,000.0	500.0	-	1,650.0
Supply and Install Runner - Unit 2 (2026-2028) - Cat Arm	582.2	1,634.6	2,620.1	-		-	4,836.9
Unit 7 Life Extension - Bay d'Espoir	[redacted]						66,264.2
Units 1-6 Spherical Valve Refurbishment (2028-2033) - Bay d'Espoir	-	-	1,500.0	1,500.0	1,500.0	1,500.0	6,000.0
Upgrade Excitation System (2026-2027) - Paradise River	218.7	203.5	-	-	-	-	422.2
Upgrade Spherical Valve Controls (2026-2029) - Bay d'Espoir	314.9	219.6	358.3	460.3	-	-	1,353.1
USL 600V and 208V Panelboard Upgrade (2028-2029) - Upper Salmon	-	-	100.0	140.0	-	-	240.0
Hydraulic Plant Total	**54,319.4**	**170,303.0**	**331,961.1**	**353,194.9**	**341,696.0**	**183,325.2**	**1,434,799.5**
Thermal Plant							
Install Plant Heating System (2028-2030) - Holyrood	-	-	4,887.3	6,858.9	3,354.9	-	15,101.1
Overhaul Generator - Unit 3 (2027) - Holyrood	-	3,823.8	-	-	-	-	3,823.8
Overhaul Major Pumps and Associated Motors (2027) - Holyrood	-	3,355.2	-	-	-	-	3,355.2
Overhaul Major Pumps and Associated Motors (2028) - Holyrood	-	-	930.0	-	-	-	930.0
Overhaul Major Pumps and Associated Motors (2029) - Holyrood	-	-	-	420.0	-	-	420.0
Overhaul Marine Terminal Loading Arms (2027) - Holyrood	-	831.1	-	-	-	-	831.1
Overhaul Turbine Valves - Unit 1 (2027) - Holyrood	-	7,973.1	-	-	-	-	7,973.1
Overhaul Turbine Valves - Unit 2 (2029) - Holyrood	-	-	-	8,500.0	-	-	8,500.0
Overhaul Turbine Valves - Unit 3 (2028) - Holyrood	-	-	12,000.0	-	-	-	12,000.0
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2027) - Holyrood	-	10,119.7	-	-	-	-	10,119.7
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2028) - Holyrood	-	-	8,500.0	-	-	-	8,500.0
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2029) - Holyrood	-	-	-	7,000.0	-	-	7,000.0
Perform Level 2 Condition Assessment - Chemical Tanks (2031) - Holyrood	-	-	-	-	-	350.0	350.0
Perform Level 2 Condition Assessment - Condenser and Condenser Tubes (2026-2027) - Holyrood	577.3	51.7	-	-	-	-	629.0
Refurbish Stage II Cooling Water Sumps (2028) - Holyrood	-	-	4,719.0	-	-	-	4,719.0
Refurbish Water Treatment Systems (2026-2027) - Holyrood	524.5	936.3	-	-	-	-	1,460.8
Replace Parts of Stage 1: 129 Vdc Batteries and Battery Chargers (2026-2027) - Holyrood	229.1	100.1	-	-	-	-	329.2
Replace Two 129 V Chargers - Stage 2 (2029-2030) - Holyrood	-	-	-	100.0	75.0	-	175.0
Thermal In-Service Failures (2027)	-	3,836.4	-	-	-	-	3,836.4
Thermal In-Service Failures (2028)	-	-	3,881.0	-	-	-	3,881.0
Thermal In-Service Failures (2029)	-	-	-	3,981.0	-	-	3,981.0
Thermal In-Service Failures (2030)	-	-	-	-	700.0	-	700.0
Upgrade Exciter and Transformer - Unit 3 (2029) - Holyrood	-	-	-	4,000.0	-	-	4,000.0
Upgrade Fire System (2029) - Holyrood	-	-	-	700.0	-	-	700.0
Thermal Plant Total	**1,330.9**	**31,027.4**	**34,917.3**	**31,559.9**	**4,129.9**	**350.0**	**103,315.4**
Generation Total	**154,201.8**	**424,367.4**	**755,771.1**	**713,616.8**	**388,915.0**	**185,063.3**	**2,621,935.4**
Transmission and Rural Operations							
Distribution							
Additions for Load - Cartwright (2024-2027)	21.5	486.3	-	-	-	-	507.8
Additions for Load (2028) - Distribution System	-	-	814.9	-	-	-	814.9
Additions for Load (2029) - Distribution System	-	-	-	836.8	-	-	836.8
Additions for Load (2030) - Distribution System	-	-	-	-	859.2	-	859.2
Additions for Load (2031) - Distribution System	-	-	-	-	-	882.2	882.2
Battle Harbour Data Solutions Inc. - Non-Firm Service Connection (2026-2027)	334.4	264.7	-	-	-	-	599.1
Construct Pole Storage Ramps (2027-2028) - Happy Valley	-	58.9	336.6	-	-	-	395.5
Distribution Equipment SCADA Additions - Phase I (2027-2028)	-	548.8	822.0	-	-	-	1,370.8
Distribution Equipment SCADA Additions (2028-2029)	-	-	562.8	832.6	-	-	1,395.4
Distribution Equipment SCADA Additions (2029-2030)	-	-	-	579.5	857.4	-	1,436.9
Distribution Equipment SCADA Additions (2030-2031)	-	-	-	-	595.3	880.7	1,476.0
Distribution Equipment SCADA Additions (2031-2032)	-	-	-	-	-	611.5	611.5
Distribution System In-Service Failures and Miscellaneous Upgrades (2027)	-	6,665.2	-	-	-	-	6,665.2
Distribution System In-Service Failures and Miscellaneous Upgrades (2028)	-	-	6,914.0	-	-	-	6,914.0
Distribution System In-Service Failures and Miscellaneous Upgrades (2029)	-	-	-	7,055.0	-	-	7,055.0
Distribution System In-Service Failures and Miscellaneous Upgrades (2030)	-	-	-	-	7,181.0	-	7,181.0
Distribution System In-Service Failures and Miscellaneous Upgrades (2031)	-	-	-	-	-	7,310.0	7,310.0
Interconnection and Integration of the Puffin Wind Inc. Renewable Energy Project (2025-2027) - Ramea	1,246.0	32.0	-	-	-	-	1,278.0
Line Extension and Upgrades for Maritime Resources (2026-2028)	256.1	12.6	350.8	-	-	-	619.5
Provide Service Extensions (2027)	-	5,816.7	-	-	-	-	5,816.7
Provide Service Extensions (2028)	-	-	5,998.0	-	-	-	5,998.0
Provide Service Extensions (2029)	-	-	-	6,112.0	-	-	6,112.0
Provide Service Extensions (2030)	-	-	-	-	6,216.0	-	6,216.0
Provide Service Extensions (2031)	-	-	-	-	-	6,321.0	6,321.0
Renew Distribution Feeders (2026-2027)	1,015.3	3,053.0	-	-	-	-	4,068.3
Renew Distribution Feeders (2027-2028)	-	242.9	2,432.7	-	-	-	2,675.6
Renew Distribution Feeders (2028-2029)	-	-	246.8	2,402.7	-	-	2,649.5
Renew Distribution Feeders (2029-2030)	-	-	-	254.2	2,474.1	-	2,728.3
Renew Distribution Feeders (2030-2031)	-	-	-	-	261.1	2,541.5	2,802.6
Renew Distribution Feeders (2031-2032)	-	-	-	-	-	268.2	268.2
Replace T1 (2027-2029) - Burgeo	-	309.9	499.8	1,717.3	-	-	2,527.0
Upgrade Distribution System - Belleoram Quarry (2026-2027) - English Harbour West	2,559.1	691.6	-	-	-	-	3,250.7
Upgrade Distribution System (2026-2027) - Wiltondale	408.7	952.7	-	-	-	-	1,361.4
Upgrade Worst-Performing Distribution Feeders (2025-2027)	6,356.3	2,529.8	-	-	-	-	8,886.1
Upgrade Worst-Performing Distribution Feeders (2026-2027)	756.3	3,534.9	-	-	-	-	4,291.2
Upgrade Worst-Performing Distribution Feeders (2027-2028)	-	176.3	3,388.8	-	-	-	3,565.1
Upgrade Worst-Performing Distribution Feeders (2028-2029)	-	-	179.0	3,370.7	-	-	3,549.7
Upgrade Worst-Performing Distribution Feeders (2029-2030)	-	-	-	184.3	3,471.0	-	3,655.3
Upgrade Worst-Performing Distribution Feeders (2030-2031)	-	-	-	-	189.3	3,565.6	3,754.9
Upgrade Worst-Performing Distribution Feeders (2031-2032)	-	-	-	-	-	194.5	194.5
Distribution Total	**12,953.7**	**25,376.3**	**22,546.2**	**23,345.1**	**22,104.4**	**22,575.2**	**128,900.9**

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	2026 and Prior Years	2027	2028	2029	2030	2031	Total
Generation							
Additions for Load Growth - Unit 2065 Replacement and Fuel Storage Upgrades (2024-2027) - Rigolet	3,359.4	484.5	-	-	-	-	3,843.9
Additions for Load Growth - Upgrade Fuel Storage (2027) - Cartwright	-	442.7	-	-	-	-	442.7
Additions for Load Growth - Upgrade Fuel Storage (2030-2031) - Nain	-	-	-	-	500.0	2,500.0	3,000.0
Additions for Load Growth (2028) - Isolated Generation Stations	-	-	967.1	-	-	-	967.1
Additions for Load Growth (2029) - Isolated Generation Stations	-	-	-	992.2	-	-	992.2
Additions for Load Growth (2030) - Isolated Generation Stations	-	-	-	-	1,015.4	-	1,015.4
Additions for Load Growth (2031) - Isolated Generation Stations	-	-	-	-	-	1,039.2	1,039.2
Diesel In-Service Failures (2027)	-	1,256.9	-	-	-	-	1,256.9
Diesel In-Service Failures (2028)	-	-	1,279.1	-	-	-	1,279.1
Diesel In-Service Failures (2029)	-	-	-	1,312.2	-	-	1,312.2
Diesel In-Service Failures (2030)	-	-	-	-	1,343.0	-	1,343.0
Diesel In-Service Failures (2031)	-	-	-	-	-	1,374.5	1,374.5
Inspect Fuel Storage Tanks (2027-2028) - Makkovik	-	187.5	2,586.3	-	-	-	2,773.8
Inspect Fuel Storage Tanks (2028-2029) - Black Tickle	-	-	127.4	1,766.3	-	-	1,893.7
Inspect Fuel Storage Tanks (2029-2030) - Nain	-	-	-	130.7	1,807.8	-	1,938.5
Inspect Fuel Storage Tanks (2031-2032) - Postville	-	-	-	-	-	136.9	136.9
Interconnection and Integration of the Nain Wind Micro-Grid System	-	233.3	1,077.7	-	-	-	1,311.0
Renew Diesel Units (2027)	-	3,642.0	-	-	-	-	3,642.0
Renew Diesel Units (2028)	-	-	2,062.0	-	-	-	2,062.0
Renew Diesel Units (2029)	-	-	-	2,101.0	-	-	2,101.0
Renew Diesel Units (2030)	-	-	-	-	2,137.0	-	2,137.0
Renew Diesel Units (2031)	-	-	-	-	-	2,173.0	2,173.0
Replace Diesel Gensets (2025-2027)	2,148.8	4,074.8	-	-	-	-	6,223.6
Replace Diesel Gensets (2027-2029)	-	224.9	258.5	2,308.1	-	-	2,791.5
Replace Diesel Gensets (2028-2030)	-	-	300.0	300.0	2,400.0	-	3,000.0
Replace Diesel Gensets (2029-2031)	-	-	-	550.0	550.0	4,100.0	5,200.0
Replace Diesel Gensets (2030-2032)	-	-	-	-	550.0	550.0	1,100.0
Replace Diesel Gensets (2031-2033)	-	-	-	-	-	300.0	300.0
Replace Diesel Plant (2028-2031) - Rigolet	-	-	5,000.0	10,000.0	10,000.0	10,000.0	35,000.0
Generation Total	**5,508.2**	**10,546.6**	**13,658.1**	**19,460.5**	**20,303.2**	**22,173.6**	**91,650.2**
Metering							
Purchase Meters and Metering Equipment (2027)	-	737.6	-	-	-	-	737.6
Purchase Meters and Metering Equipment (2028)	-	-	707.2	-	-	-	707.2
Purchase Meters and Metering Equipment (2029)	-	-	-	721.6	-	-	721.6
Purchase Meters and Metering Equipment (2030)	-	-	-	-	734.5	-	734.5
Purchase Meters and Metering Equipment (2031)	-	-	-	-	-	747.7	747.7
Replace Metering and Instrument Transformers (2028-2030)	-	-	2,500.0	1,500.0	1,000.0	-	5,000.0
Upgrade PLX Metering System (2026-2028) - Labrador East	1,188.8	485.8	494.3	-	-	-	2,168.9
Metering Total	**1,188.8**	**1,223.4**	**3,701.5**	**2,221.6**	**1,734.5**	**747.7**	**10,817.5**
Terminal Stations							
Additions for Load Growth - Upgrade Terminal Station (2027-2030) - Jean Lake	-	2,830.2	10,819.5	9,447.8	4,271.4	-	27,368.9
Install Breaker Failure Protection (2027-2028)	-	993.1	1,523.7	-	-	-	2,516.8
Install Breaker Failure Protection (2028-2029) - Hardwoods	-	-	144.3	298.2	-	-	442.5
Install Breaker Failure Protection (2029-2030) - Wabush Terminal Station	-	-	-	222.3	458.8	-	681.0
Install Breaker Failure Protection (2031-2032) - Upper Salmon	-	-	-	-	-	95.2	95.2
Install Fire Protection in 230 kV Stations (2027-2028) - Bottom Brook	-	73.8	578.3	-	-	-	652.1
Perform Major Inspection - Synchronous Condenser 1 (2026-2027) - Wabush Terminal Station	43.0	700.7	-	-	-	-	743.7
Perform Major Inspection - Synchronous Condenser 2 (2027-2028) - Wabush Terminal Station	-	63.6	661.3	-	-	-	724.9
Perform Major Inspection - Synchronous Condenser 2 (2030-2031) - Wabush Terminal Station	-	-	-	-	102.1	579.2	681.3
Perform Modified Major Inspection - Synchronous Condenser 1 (2029-2030) - Wabush Terminal Station	-	-		105.0	609.0	-	714.0
Purchase Spare Generator Step Up Transformer (2023-2028)	1,014.2	4,313.0	6,996.8	-	-	-	12,324.0
Renew Circuit Breakers (2026-2028)	188.2	2,250.1	1,975.6	-	-	-	4,413.9
Renew Circuit Breakers (2027-2029)	-	130.0	168.9	1,651.6	-	-	1,950.5
Renew Circuit Breakers (2028-2030)	-	-	909.3	329.7	1,841.8	-	3,080.8
Renew Circuit Breakers (2029-2031)	-	-	-	1,084.1	1,241.1	1,321.4	3,646.6
Renew Circuit Breakers (2030-2032)	-	-	-	-	1,407.3	1,082.7	2,490.0
Renew Circuit Breakers (2031-2033)	-	-	-	-	-	1,519.7	1,519.7
Replace Circuit Breaker Reclosing Controllers (2027-2028) - Come by Chance	-	69.1	107.0	-	-	-	176.1
Replace Circuit Breaker Reclosing Controllers (2028-2029) - HRD B3L18	-	-	58.9	93.3	-	-	152.2
Replace Circuit Breaker Reclosing Controllers (2029-2030) - Indian River	-	-	-	60.4	95.8	-	156.2
Replace Circuit Breaker Reclosing Controllers (2030-2031) - Bear Cove	-	-	-	-	62.0	98.3	160.3
Replace Disconnects (2026-2028)	169.1	1,694.0	631.6	-	-	-	2,494.7
Replace Disconnects (2027-2029)	-	140.1	834.9	601.9	-	-	1,576.9
Replace Disconnects (2028-2030)	-	-	230.2	427.0	578.9	-	1,236.1
Replace Disconnects (2029-2031)	-	-	-	250.0	461.4	609.1	1,320.6
Replace Disconnects (2030-2032)	-	-	-	-	299.0	537.3	836.2
Replace Disconnects (2031-2033)	-	-	-	-	-	296.9	296.9
Replace Exciter Controller - SC1 and SC2 (2027-2028) - Wabush	-	467.3	200.4	-	-	-	667.7
Replace Instrument Transformers (2026-2027)	371.2	196.1	-	-	-	-	567.3
Replace Instrument Transformers (2027-2028)	-	72.0	365.3	-	-	-	437.3
Replace Instrument Transformers (2028-2029)	-	-	291.6	200.1	-	-	491.8
Replace Instrument Transformers (2029-2030)	-	-	-	256.0	175.3	-	431.2
Replace Instrument Transformers (2030-2031)	-	-	-	-	292.1	194.8	486.9
Replace Instrument Transformers (2031-2032)	-	-	-	-	-	401.2	401.2
Replace Power Cables Synchronous Condensers 1 and 2 (2028-2029) - Wabush Terminal Station	-	-	481.7	1,007.4	-	-	1,489.2
Replace Protective Relays (2026-2027)	616.0	1,969.8	-	-	-	-	2,585.8
Replace Protective Relays (2027-2028)	-	700.1	2,314.2	-	-	-	3,014.3
Replace Protective Relays (2028-2029)	-	-	1,030.7	1,731.2	-	-	2,761.9
Replace Protective Relays (2029-2030)	-	-	-	793.0	1,330.5	-	2,123.5
Replace Protective Relays (2030-2031)	-	-	-	-	929.0	1,514.0	2,443.0
Replace Protective Relays (2031-2032)	-	-	-	-	-	1,250.2	1,250.2
Replace Switchgear (2028-2030) - Grand Falls Terminal Station	-	-	141.0	435.6	906.1		1,482.7
Replace Switchgear Synchronous Condensers 1 and 2 (2028-2029) - Wabush Terminal Station	-	-	1,192.4	2,492.7	-	-	3,685.1
Replace Terminal Station Battery Banks and Chargers (2026-2027)	326.1	236.7	-	-	-	-	562.8
Replace Terminal Station Battery Banks and Chargers (2027-2028)	-	26.1	182.4	-	-	-	208.5
Replace Terminal Station Battery Banks and Chargers (2028-2029)	-	-	137.8	94.9	-	-	232.7
Replace Terminal Station Battery Banks and Chargers (2029-2030)	-	-	-	158.6	109.0	-	267.6
Replace Terminal Station Battery Banks and Chargers (2030-2031)	-	-	-	-	113.5	75.7	189.2
Replace Terminal Station Battery Banks and Chargers (2031-2032)	-	-	-	-	-	409.5	409.5
Terminal Station In-Service Failures (2027)	-	2,203.3	-	-	-	-	2,203.3
Terminal Station In-Service Failures (2028)	-	-	2,223.9	-	-	-	2,223.9
Terminal Station In-Service Failures (2029)	-	-	-	2,289.2	-	-	2,289.2
Terminal Station In-Service Failures (2030)	-	-	-	-	2,350.7	-	2,350.7

Newfoundland and Labrador Hydro
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Five-Year Capital Plan Detailed Breakdown by Major and Minor - Asset Category[1]
($000)

	2026 and Prior Years	2027	2028	2029	2030	2031	Total
Terminal Station In-Service Failures (2031)	-	-	-	-	-	2,413.8	2,413.8
Upgrade Data Alarm Systems (2029-2030) - Springdale	-	-	-	19.0	35.6	-	54.5
Upgrade Power Transformers (2026–2027)	1,705.0	401.8	-	-	-	-	2,106.8
Upgrade Power Transformers (2027–2028)	-	518.1	766.2	-	-	-	1,284.3
Upgrade Power Transformers (2028-2029)	-	-	86.9	2,561.0		-	2,647.9
Upgrade Power Transformers (2029-2030)	-	-	-	69.9	1,980.4	-	2,050.3
Upgrade Power Transformers (2030-2031)	-	-	-	-	51.9	1,061.5	1,113.4
Upgrade Power Transformers (2031-2032)	-	-	-	-	-	53.3	53.3
Upgrade Terminal Station for Mobile Substation (2026-2027) - St. Anthony Diesel	66.1	328.6	-	-	-	-	394.7
Upgrade Terminal Station for Mobile Substation (2027-2028) - Glenburnie	-	78.2	330.2	-	-	-	408.4
Upgrade Terminal Station for Mobile Substation (2028-2029) - Roddickton	-	-	89.6	536.2	-	-	625.8
Upgrade Terminal Station for Mobile Substation (2029-2030) - Grandy Brook	-	-	-	94.7	565.2	-	659.9
Upgrade Transformers (2028-2030) - Sunnyside and Stony Brook	-	-	392.4	5,218.4	28,593.6	-	34,204.4
Terminal Stations Total	**4,498.9**	**20,455.8**	**35,867.2**	**32,529.3**	**48,861.3**	**13,513.7**	**155,726.2**
Tools and Equipment							
Replace Heavy-Duty Mobile Equipment (2026-2028)	173.8	1,809.7	2,112.2	-	-	-	4,095.7
Replace Heavy-Duty Mobile Equipment (2027-2028)	-	1,996.2	579.3	-	-	-	2,575.5
Replace Light-Duty Mobile Equipment (2027)	-	1,542.0	-	-	-	-	1,542.0
Replace Mobile Equipment (2025-2027)	2,028.2	3,202.3	-	-	-	-	5,230.5
Tools and Equipment Total	**2,202.0**	**8,550.2**	**2,691.5**	**-**	**-**	**-**	**13,443.7**
Transmission							
L23/24 Steel-Tower Transmission Line Renewal (2026-2029)	576.2	2,735.3	2,539.1	2,726.8	-	-	8,577.4
Procurement of Lidar for Digitization of Transmission Lines (2027)	-	500.0	-	-	-	-	500.0
Refurbish Aluminum Towers (2027-2028) - TL212	-	165.7	2,591.3	-	-	-	2,757.0
Refurbish Steel Towers (2029-2030) - TL202/TL206	-			160.0	2,150.0	-	2,310.0
Relocate Section of Line (2026-2028) - TL220	79.7	2,970.7	1,041.0	-	-	-	4,091.4
Renew Self-Supporting Foundation (2029-2030) - TL212	-	-	-	100.0	400.0	-	500.0
TL210 Modification - New Found Gold (2026–2027)	696.1	3,854.1	-	-	-	-	4,550.2
Transmission In-Service Failures (2027)	-	194.5	-	-	-	-	194.5
Transmission In-Service Failures (2028)	-	-	198.7	-	-	-	198.7
Transmission In-Service Failures (2029)	-	-	-	206.0	-	-	206.0
Transmission In-Service Failures (2030)	-	-	-	-	213.1	-	213.1
Transmission In-Service Failures (2031)	-	-	-	-	-	220.5	220.5
Wood Pole Line Management (2027)	-	7,998.0	-	-	-	-	7,998.0
Wood Pole Line Management (2028)	-	-	8,451.0	-	-	-	8,451.0
Wood Pole Line Management (2029)	-	-	-	8,100.0	-	-	8,100.0
Wood Pole Line Management (2030)	-	-	-	-	8,629.0	-	8,629.0
Wood Pole Line Management (2031)	-	-	-	-	-	10,060.0	10,060.0
Transmission Total	**1,352.0**	**18,418.3**	**14,821.1**	**11,292.8**	**11,392.1**	**10,280.5**	**67,556.8**
Transmission and Rural Operations Total	**27,703.7**	**84,570.6**	**93,285.6**	**88,849.2**	**104,395.4**	**69,290.7**	**468,095.2**
Total Capital Plan	**196,284.4**	**545,598.3**	**896,493.8**	**846,942.9**	**526,394.0**	**289,234.4**	**3,300,947.7**

[1] Numbers may not add due to rounding.

Appendix B

Capital Expenditures (2022–2031)





Newfoundland and Labrador Hydro
2027 Capital Budget Application
Capital Expenditures 2022–2031[1]
($000)

	Actuals									
	2022	**2023**	**2024**	**2025**	**2026F**	**2027**	**2028**	**2029**	**2030**	**2031**
Access	13,285.5	13,846.8	6,591.2	5,601.7	7,175.4	11,166.1	7,426.5	6,112.0	6,216.0	6,321.0
Allowance for Unforeseen	800.9	-	-	-	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0
General Plant	9,133.4	13,183.3	20,563.4	32,902.8	40,658.0	44,827.0	58,031.5	54,841.4	36,654.2	34,612.4
Mandatory	2,264.4	388.7	2,938.0	2,095.8	2,035.1	1,223.4	3,701.5	2,221.6	2,384.5	747.7
Renewal	67,942.2	96,149.9	108,105.3	167,276.4	108,589.0	179,327.0	188,908.8	173,768.2	133,961.2	71,462.1
Service Enhancement	5,494.0	12,839.9	9,226.3	9,355.9	12,882.5	16,479.1	19,160.2	16,391.9	16,487.3	16,095.3
System Growth	4,487.6	12,467.4	6,751.4	6,302.1	5,662.0	291,575.8	618,265.3	592,607.7	329,690.7	158,995.9
Total	**103,408.2**	**148,876.0**	**154,175.6**	**223,534.6**	**178,001.9**	**545,598.3**	**896,493.8**	**846,942.9**	**526,394.0**	**289,234.4**

[1] Numbers may not add due to rounding.

Schedule 3

Holyrood Thermal Generating Station Overview

Future Operation and Capital Expenditure Requirements



2027 Capital Budget Application

Holyrood Thermal Generating Station Overview

Future Operation and Capital Expenditure Requirements



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1.0 Background

In the Board of Commissioners of Public Utilities ("Board") Order No P.U. 5(2012), Newfoundland and Labrador Hydro ("Hydro") was directed to file, in conjunction with its 2013 Capital Budget Application ("CBA"), an overview in relation to the proposed capital expenditures for the Holyrood Thermal Generating Station ("Holyrood TGS"). The Board required the overview to include the following:

- An updated outlook regarding anticipated changes in the role of the Holyrood TGS on the system;
- An updated schedule of anticipated changes in the Holyrood TGS operations that may reasonably be expected to have an impact on capital expenditure requirements;
- A summary description of all proposed Holyrood TGS capital projects, including an explanation of how such projects relate to one another and whether such projects may be impacted by decisions yet to be taken regarding the Holyrood TGS's role on the system;
- A summary guide to all internal and external reports filed in support of the capital expenditure proposals, summarizing alternatives considered, and recommendations made; and
- An explanation of the necessity of all proposed capital expenditures in the context of the anticipated changes in the Holyrood TGS operations.

Through 2022, Hydro continued to update and file the Holyrood TGS Overview report annually within its CBA. In Board Order No. P.U. 2(2023), Hydro was directed to file a more comprehensive report with its 2024 CBA, outlining the planned operation of the facility until the latter of March 31, 2030, or the anticipated conclusion of generation operations at the facility, and including full discussion and analysis of reasonable alternative approaches and reasonable capital costs over the full period. This report provides an update for the 2027 CBA that outlines Hydro's operational outlook, maintenance strategy, and capital plan for 2027–2031.

2.0 Introduction

The Holyrood TGS, as seen in Figure 1, is currently a critical part of the Island Interconnected System. With three oil-fired generating units providing an installed capacity of 490 MW, the Holyrood TGS can

generate up to 40% of the Island's annual energy needs if necessary. In 2025, Holyrood TGS was responsible for approximately 11% of the Island's energy needs. Units 1 and 2 were commissioned in 1970 and 1971, respectively, and Unit 3 in 1979. Units 1 and 2 were originally designed to produce 150 MW each and were upgraded to 170 MW in 1988 and 1989, respectively. Unit 3 retains its original configuration and is rated at 150 MW. In 1986, Unit 3 was retrofitted with synchronous condensing capability to provide voltage support on the eastern area of the Island Interconnected System during periods when power generation from this unit is not required.



Figure 1: Holyrood TGS

The three major components of the thermal generating process are the boiler, turbine, and generator, with supporting systems such as fuel oil storage and delivery, controls, and cooling and feedwater supply systems. Through the combustion of No. 6 heavy fuel oil, the power boiler provides high-energy steam to the turbine. The turbine is directly coupled to the generator and provides the rotating energy necessary for the generator to produce rated output power on the Island Interconnected System. The

generator itself is pressurized and cooled by hydrogen gas to provide maximum efficiency both in heat transfer and reduced windage losses.[1]

In 2021, Hatch Ltd. ("Hatch") completed its Life Extension Condition Assessment Study ("LECA"),[2] including a capital plan to support the standby operation of the Holyrood TGS to 2030. In 2024, Hatch completed a refresh to their capital plan, which also considered operations to 2035 to inform the capital costs of operating beyond 2030, should this be required.[3] Hatch's plans inform Hydro's capital expenditures outlook as discussed in Section 6.0.

3.0 Current Operational Outlook and Schedule

Hydro has recommended that all three Holyrood TGS units and the Hardwoods and Stephenville Gas Turbines are to remain available through the "Bridging Period" [4] while Hydro seeks to develop new long-term sources of supply. This is in accordance with capacity requirements as specified by Hydro in the 2024 Resource Adequacy Plan[5] as part of the *Reliability and Resource Adequacy Study Review* proceeding ("*RRA Study Review*").

The results of the Holyrood TGS LECA provide an indication of the capital asset renewal and maintenance investments that will be required for the continued operation of the Holyrood TGS in the near term. Based on the information provided, Hydro can expect the reasonable operation of the facility through the Bridging Period, with required human resource, capital, and maintenance investments. In 2024, Hydro completed a refresh of the capital plan presented in this condition assessment. The

[1] Windage losses refer to the losses sustained by a machine due to the resistance offered by air to the rotation of the shaft. Windage losses occur in electric rotating machines such as motors and generators.
[2] "*Reliability and Resource Adequacy Study Review* – Assessment to Determine the Potential Long-Term Viability of the Holyrood Thermal Generating Station," Newfoundland and Labrador Hydro, March 31, 2022, att. 2.
[3] "*Reliability and Resource Adequacy Study Review* – Holyrood Thermal Generating Station Capital Plan Refresh," Newfoundland and Labrador Hydro, March 7, 2025, att. 1.
[4] Hydro considers the Bridging Period to be from the present to 2030, or until such time that sufficient alternative generation is commissioned, adequate performance of the Labrador-Island Link is proven, and generation reserves are met. During the Bridging Period, the system would rely primarily on existing sources of generation capacity to maintain reliability while new generation capacity is being built. The primary, readily available supply options in this period are extending the retirements of the Holyrood TGS, Stephenville Gas Turbine and the Hardwoods Gas Turbine until their capacities can be adequately replaced.
[5] "2024 Resource Adequacy Plan – An Update to the Reliability and Resource Adequacy Study," Newfoundland and Labrador Hydro, rev. August 26, 2024 (originally filed July 9, 2024).

purpose of this refresh was to assess the cost of the operation of Holyrood TGS beyond 2030,[6] to inform supply options in the event that some supply from Holyrood TGS is needed in advance of the commissioning of new generation. This study also refreshed the required capital investments for the continued operation of the Holyrood TGS to 2030 and beyond, as necessary, to aid future analysis.

It should be noted that Hydro's 2027 CBA and this schedule assumes a transition to post-steam on March 31, 2030 and the associated capital investments to keep the Holyrood TGS operational until that time. Should Hydro decide to extend Holyrood TGS beyond that date, more material capital investments than those listed within would be required. The 2024 Resource Adequacy Plan demonstrated that retirement of the Holyrood TGS cannot be fully enabled until both the Avalon Combustion Turbine ("CT") and Bay d'Espoir ("BDE") Unit 8 are in service. The extension of the Holyrood TGS operations will result in combined fuel, capital, and operating costs exceeding $100 million per year.[7]

While the Holyrood TGS is constrained by federal *Clean Electricity Regulations*[8] which preclude its operation beyond 2035, Hydro's position is that the Holyrood TGS should be retired much earlier than 2035. That is not solely due to the costs that would be incurred. Hydro's mandate requires the balance of least-cost, environmental responsibility and reliability in providing electricity service to customers. In addition to the material financial risk and environmental considerations, the reliability risk of continued reliance on the Holyrood TGS is growing, as its performance is unpredictable.

Holyrood TGS is an aging thermal facility with increasingly unpredictable performance. The advanced age of the asset introduces a heightened risk of failure and increased costs associated with maintaining its operation. Over the last five years, as a result of annual reliability analysis to inform Hydro's near-term reliability analysis, Hydro has revised its base and sensitivity forced outage rate assumptions from

[6] As noted in correspondence "*Reliability and Resource Adequacy Study Review* – Planned Reports, Studies and Analyses – Response to Further Comments and Directions," Newfoundland and Labrador Hydro, January 19, 2024, Hatch was requested to assess life extension up to 2035; however, Hydro does not intend to keep Holyrood TGS in operation for this full period.
[7] "Newfoundland and Labrador Hydro - Application for Capital Expenditures for the Purchase and Installation of Bay d'Espoir Unit 8 and Avalon Combustion Turbine, and Bay d'Espoir Unit 8 Project and Avalon Combustion Turbine Project Early Execution Updates for October 2025 – Request for Further Information – Hydro's Reply," Newfoundland and Labrador Hydro, December 19, 2025, p. 3.
[8] *Clean Electricity Regulations*, SOR/2024-263.

15% and 20% to 20% and 34%, respectively, indicating a trend of worsening reliability.[9,10] Hydro anticipates this trend will continue as the asset continues to age and operate beyond its intended design life, consistent with the "Bathtub Curve" model of equipment failure, which predicts higher and accelerating rates of failure at or near the end of an asset's useful life.[11]

The operational dependency on the Holyrood TGS is directly linked to overall system reliability. Continued reliance on this aging thermal facility increases exposure to unplanned outages, resulting in the increased likelihood of customer outages. Despite continued maintenance efforts and ongoing sustaining capital investments, Hydro's recent experience in late January 2026 has demonstrated that the reliability performance of the Holyrood TGS is erratic due to the age, condition, and inherent limitations of the facility. Reliance on an asset with decreasing reliability but high and increasing costs would not be consistent with good utility practice.

For the reasons described above, the availability of the Holyrood TGS as a meaningful capacity backup for the Island Interconnected System beyond 2030 is becoming increasingly uncertain.

4.0 Maintenance Strategy through to Decommissioning

Scheduled overhauls of plant equipment are ongoing to support the safe operation and continued availability of assets for generation. Significant changes to Hydro's maintenance strategy between now and the planned retirement date are not anticipated at this time; however, should additional capital costs be identified, diligent consideration will be given to the expenditures prior to application to the Board. Changes in equipment refurbishment intervals may be considered depending on annual operating hours; an extension beyond more typical timeframes may be achieved in some instances, allowing Hydro to reduce costs while maintaining safety and reliability. Advancement of refurbishment intervals may be required in some instances, as necessitated by asset condition.

[9] Holyrood Forced Outage Rate assumptions were updated as part of the 2022 Reliability and Resource Adequacy Study update. Please refer to "Reliability and Resource Adequacy Study – 2022 Update," Newfoundland and Labrador Hydro, October 3, 2022, vol. III, att. 4. These assumptions will be revised in advance of the next Reliability and Resource Adequacy Study update.
[10] Near-term reliability assumptions are provided in Hydro's Near-Term Reliability Report, filed annually under the *RRA Study Review*.
[11] "2024 Resource Adequacy Plan – An Update to the Reliability and Resource Adequacy Study," Newfoundland and Labrador Hydro, rev. August 26, 2024 (originally filed July 9, 2024), 2024 Resource Plan Overview, p. 16.

During post-steam operations, assets with operational synchronous condenser requirements will continue to be optimally maintained.[12] An overview of Hydro's maintenance philosophy for the Holyrood TGS assets is provided in Appendix A to this schedule.

5.0 Holyrood 2027 Capital Plan Summary

Planned 2027 capital expenditures for the Holyrood TGS include investments for both steam-related generation and post-steam-related operation. The 2027 capital project proposals were identified considering safety, environment, asset condition, equipment obsolescence, forecast production requirements, and Hydro's commitment to have the Holyrood TGS fully available through the Bridging Period. The projects outlined herein reflect the necessary refurbishment and replacement projects to support the reliability of the Holyrood TGS and the provision of service to customers. In the event of unforeseen failure or unexpected as-found conditions, adjustments or additions may be required beyond the current plan.

Hydro's proposed projects and programs in the 2027 CBA are informed by the original LECA and the 2024 Capital Plan Refresh, supplemented by Hydro's operational experience and updated asset condition information.

Table 1 provides a summary description of the proposed 2027 capital programs and projects for the Holyrood TGS.

[12] Hydro's planning assumptions assume that Holyrood TGS Unit 3 will remain as a synchronous condenser post-steam. Through the *RRA Study Review*, Hydro is evaluating post-steam Avalon synchronous condenser requirements, which will inform the future role of Holyrood TGS Unit 3.

Table 1: Holyrood TGS Programs and Projects Proposed in the 2027 CBA

Requirement	Program/Project (Totals)	Scope Summary	Proposal Location
Steam	Perform Boiler Condition Assessment and Miscellaneous Upgrades (2027) ($10.1 million)	This project is required to complete identified Level 2 Condition Assessments and detailed inspections of high-pressure boiler components and high-energy piping components. The boilers and associated high-energy piping are exposed to multiple aggressive degradation mechanisms and require regular inspection to monitor deterioration rates and plan interventions. This work is essential to ensure the safe and reliable operation of the boilers. The 2027 scope includes work that was identified through prior assessments, such as the replacement of High-Pressure Heater #6 on Unit 3. Replacements and refurbishments identified through the completion of the boiler work, such as the replacement of expansion joints, which are deemed capital in nature, will be included in the scope of this project.	Schedule 7, Project 2
Steam	Overhaul Turbine Valves – Unit 1 (2027) ($8.0 million)	This project is required to complete an overhaul on a three-year cycle for the turbine valves, and is appropriate based on the observations made during previous overhauls. The turbine valve overhaul will consist of dismantling all the control valves, main stop valve, combined reheat stop and intercept valves, extraction non-return valves, and blowdown valve for inspection and detailed measurements. The valves will be refurbished as required through the replacement of damaged parts. An overhaul of the valves is required for safe control and operation of the steam turbine.	Schedule 7, Project 3
Steam	Thermal In-Service Failures (2027) ($3.8 million)	The purpose of this program is to allow the completion of capital work due to the failure of equipment or the recognition of an incipient failure that cannot wait for the next capital submission cycle. This program also includes the purchase of critical capital spares to reduce downtime and increase availability should a failure of a key component occur.	Schedule 7, Program 4
Post-Steam[13]	Overhaul Generator Unit 3 – (2027) ($3.8 million)	This project is required to complete an overhaul on a six-year cycle for the generator, and is appropriate based on the observations made during previous overhauls. The generator overhaul will include removal of the generator rotor for detailed condition assessment, electrical testing, and refurbishment of the stator and rotor. A detailed inspection of bearings and other mechanical components, including clearances, dimensional checks, and alignment, will be included.	Schedule 7, Project 6

[13] Projects required post-steam are also required for generation (steam) operation.

Requirement	Program/Project (Totals)	Scope Summary	Proposal Location
Steam	Overhaul Major Pumps and Associated Motors (2027) ($3.4 million)	This project is required to complete the identified inspection and overhaul of the Unit 1 East Boiler Feed Pump, Unit 1 North Condensate Extraction Pump, and the Unit 3 East Boiler Feed Pump. The 2027 scope of work for the pumps identified for overhaul includes the disassembly, inspection, refurbishment and replacement of parts, as required, and reassembly and commissioning. The motors that drive the identified pumps will also be overhauled as part of the scope. This project will also include replacement of the Unit 3 South Vacuum Pump with an existing capital spare.	Schedule 7, Project 8
Steam	Overhaul Marine Terminal Loading Arms (2027) ($0.8 million)	This project is required to overhaul the marine terminal loading arms that provide the link connection between a delivery tanker and the shore piping that leads to the fuel oil storage tank farm. This work is a continuation of a three-year overhaul schedule that has proven to be effective. The loading arms were last overhauled in 2024. Overhaul is required to ensure that the arms will operate as required to accept a tanker delivery, and will not leak heavy fuel oil into the ocean during off-loading activities. Tanker deliveries are required several times per year depending on fuel consumption rates.	Schedule 7, Project 29

Table 2 provides a summary description of programs and projects which were previously approved, with planned expenditures in the 2027 CBA.

Table 2: Previously Approved Holyrood TGS Programs and Projects with Expenditures in the 2027 CBA[14]

Requirement	Program/Project (Totals)	Scope Summary
Post-Steam[15]	Refurbish Water Treatment Systems (2026–2027) ($0.9 million in 2027; $1.5 million total)	The scope of this two-year project entails the refurbishment of the water treatment systems at the Holyrood TGS. The Water Treatment Plant ("WTP") and the Wastewater Treatment Plant ("WWTP") are necessary components of the Holyrood TGS. The WTP is required for operation during steam production, and the WWTP, which is required to treat plant wastewater, will be required to process plant run-off and other site wastewater for 25 years post-steam generation. Hydro is proposing to complete the necessary inspection, resin replacement, and out-of-service inspections for the cation, anion, mixed beds, condensate polisher vessels, batch reactor vessel, and replacement of the inlet piping in the clarifier tank.

[14] Approved in Board Order No. P.U. 2(2026).
[15] A portion of the expenditures in this project are also attributed to steam-related expenditures.

Requirement	Program/Project (Totals)	Scope Summary
Post-Steam	Replace Parts of Stage 1: 129 Vdc Batteries and Battery Chargers (2026–2027) ($0.1 million in 2027; $0.3 million total)	This two-year project replaces the 129 Vdc battery bank and chargers servicing Unit 1 and Unit 2 at the Holyrood TGS. This equipment provides direct current power to protection and control systems, and other essential back-up equipment, that ensures safe and reliable operation of the thermal units. The battery bank and chargers that are being replaced are 20 years old in 2026 and are considered to be at the end of their useful life.
Steam	Perform Level 2 Condition Assessment – Condenser and Condenser Tubes (2026–2027) ($0.1 million in 2027; $0.6 million total)	This two-year project is required to complete a Level 2 Condition Assessment of the condensers and condenser tubes on each of the three generating units. The assessment of the tubes will include Eddy Current Testing, which is a non-destructive technique used to find damage and overall thinning of the tubes that could lead to an in-service failure. Visual inspection of the steam and water sides of the condensers will also be completed to identify any concerns that may require repair or replacement to ensure continued reliable operation. Assessment work will be completed in year one, and the final report will be received in year two.

Hydro is managing several deteriorating pieces of infrastructure, notably fuel oil storage tanks, to reach end-of-generation life with minimal refurbishment costs. To continue to minimize the investment in assets that are not planned for long-term operation, Hydro worked with a consultant and the regulator to extend the operating life of the fuel oil storage tanks, as is summarized in Table 3. Extension of generation requirements beyond 2030 could trigger significant work on the Holyrood TGS fuel oil storage tanks. All three storage tanks, plus the day tank, would require an overhaul prior to 2035 if steam operation continues.

Table 3: Fuel Oil Storage Tank Status

Tank	Status
Fuel Oil Storage Tank 1	This tank is in service. The next overhaul would be required in 2034.
Fuel Oil Storage Tank 2	This tank has been removed from service. In 2025, all fuel was removed from the tank, and internal cleaning was completed. The tank remains standing, empty of all product. A least-cost evaluation was completed and determined that the tank should continue to stand empty until demolition of the entire tank farm.
Fuel Oil Storage Tank 3	This tank is in service. The next overhaul would be required in 2031.
Fuel Oil Storage Tank 4	This tank is in service. The next overhaul would be required in 2034.
Day Tank	This tank is in service. The next overhaul would be required in 2033.

Based on current operating assumptions, Hydro has determined that the increased risks related to operating with three tanks are acceptable through the Bridging Period.

Table 4 outlines programs and projects proposed in the 2027 CBA by major system or subsystem and the necessity for steam generation or post-steam operation.

Table 4: 2027 Program/Project Necessity in the Context of Steam Generation or Post-Steam Operation

Major System or Subsystem	Program/Project	Steam Generation	Post-Steam Operation
Fuel Storage and Delivery	N/A	N/A	N/A
Feedwater and Condensate	Overhaul Major Pumps and Associated Motors (2027)	Required	N/A
Boiler	Perform Boiler Condition Assessment and Miscellaneous Upgrades (2027)	Required	N/A
Turbine Generator	Overhaul Turbine Valves – Unit 1 (2027)	Required	N/A
	Overhaul Generator – Unit 3 (2027)	Required	Required
Cooling Water Systems	N/A	N/A	N/A
Buildings and Grounds	N/A	N/A	N/A
Common Systems	Overhaul Marine Terminal Loading Arms (2027)	Required	N/A
	Thermal In-Service Failures (2027)[16]	Required	Required

6.0 Holyrood TGS 2027–2031 Capital Expenditures Outlook

Capital investment will be necessary from 2027 to 2031 to ensure the continued reliability of supply and maintenance of the level of service required in steam generation and post-steam operations. Various types of investments and expenditures for the Holyrood TGS are anticipated, including overhaul, refurbishment, upgrade or replacement of failed or obsolete equipment, and general plant infrastructure. In 2024, Hatch completed a refresh of the capital plan presented in their 2021 condition assessment. This study refreshed the required capital investments for the continued operation of the

[16] Major system or subsystem is dependent on the type of failure.

Holyrood TGS to 2030. Hydro's capital plan for 2027–2031 largely reflects the capital plan provided by Hatch, with modifications to reflect operational plans and limitations.

Hydro's planned capital expenditures for the Holyrood TGS for the period 2027–2030, segmented by steam-related and post-steam-related expenditures, are provided in Chart 1.

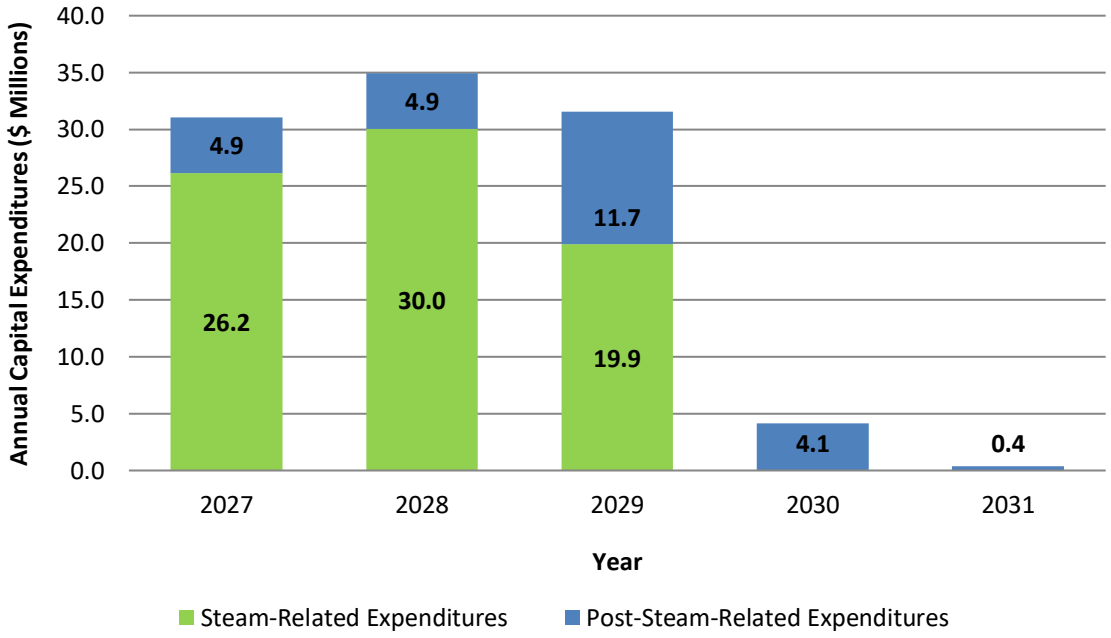


Chart 1: Holyrood TGS Capital Expenditures 2027–2031[17,18,19]

Planned expenditures for the 2027–2031 capital plan period total $102.0 million, of which $76.1 million is related to steam generation and $25.9 million is related to post-steam operation. Approximately $58.0 million is associated with the continuation of existing capital programs and routine expenditures, including regularly scheduled overhauls of critical generation equipment, including boilers, turbine valves and turbines, generators, and major pumps. Continuation of these programs is essential in maintaining the safe and reliable operation of the thermal units.

[17] Numbers may not add due to rounding.
[18] Included in the 2027–2029 generation-related expenditures category is an annual average of $3.9 million for thermal in-service failures. Depending on the failure type, a portion of the $3.9 million could be attributed to synchronous condenser-related expenditures. In 2030 and 2031, the entire thermal in-service failure expenditure of $0.7 million is considered to be synchronous condenser-related.
[19] Expenditures classified as "Post-Steam-Related Expenditures" may also be required for steam generation.

In addition to asset renewal, the current five-year capital plan includes the design and implementation of a plant heating solution for the Holyrood TGS, required following the end-of-steam generation at the Holyrood TGS. A source of plant heat is also required in the near term to prevent the possibility of plant freeze-up and severe damage to critical generation equipment, should a circumstance arise where all three boilers at Holyrood TGS are not available simultaneously during cold weather. Hydro is assessing options for plant heating and will submit a project, as required, to address the near-term and long-term needs. The project timing is subject to change but is currently planned for submission in the 2028 CBA.

A detailed list of planned capital expenditures is provided in Appendix B.

Several assumptions have been made in the creation of the capital plan for the Holyrood TGS. This includes projected scenarios of timelines for the transition of generation capability from the Holyrood TGS to new generation assets, the expected retirement sequence and retirement dates of the thermal generating units at the Holyrood TGS, and other key operational assumptions. These assumptions and the associated capital plan reflect the prudent investment required to ensure safe, cost-effective, and reliable operation of the thermal units until their planned retirement dates.

Assumptions and Constraints:

1) When steam generation is completed at the Holyrood TGS, the site will continue to operate Unit 3 as a synchronous condenser.[20] The Holyrood CT and the black start diesels will also continue to operate. On-site assets, including buildings, which are required to support these functions, will continue to be maintained, as appropriate, beyond the end-of-stream date until no longer required.

2) The plant's annual operation schedule is assumed to remain consistent with recent operations, with the critical winter period from December 1 to March 31 ("Operating Months") annually and time available for capital upgrades and maintenance outside of this operating period.

[20] Hydro's planning assumptions assume that Holyrood TGS Unit 3 will remain as a synchronous condenser post-steam. Through the *RRA Study Review*, Hydro is evaluating post-steam Avalon synchronous condenser requirements, which will inform the future role of Holyrood TGS Unit 3.

3) It is assumed that units will be mostly online during the winter Operating Months, and as such, there will not be a requirement to exercise idle units by starting them and running them up to full load regularly. Hence, this operational plan does not require a change in capital and operating maintenance requirements, which would otherwise be necessitated by increasing the number of stops and starts performed on the units annually.

Years 2027–2030:

Holyrood TGS units will typically be online and staged to meet load requirements, as needed, from mid-October through the March timeframe.[21]

1) Since units are assumed to be mostly online during the operating months, it is assumed there will be no reduction in maintenance philosophy, including preventative maintenance programs, which will not materially change other than continuous improvements through annual reviews completed by Hydro.

2) Staffing levels at Holyrood TGS will remain consistent with the current operation.

3) Units will not be required to start-up faster than the current rate of 24 hours from cold for the first unit, and 30 hours for the second unit. No capital investment will be made to facilitate faster start times or improve standby operation.

4) An alternate source of heat is required to prevent freeze-up of the plant and consequential severe damage to critical generation equipment should all three boilers at Holyrood TGS be unavailable for operation simultaneously during cold weather. This plant heating project is currently planned to be submitted in the 2028 CBA.

5) Current reliability targets, derated adjusted forced outage rate ("DAFOR"),[22] and derated adjusted utilization forced outage probabilities ("DAUFOP")[23] – 20% (as noted in the *RRA Study*

[21] The operation of the Holyrood TGS will be determined in advance of each winter operating season, depending on system conditions at that time.
[22] DAFOR is a metric that measures the percentage of time that a unit or group of units is unable to generate at its maximum continuous rating due to forced outages or unit deratings.
[23] DAUFOP is a metric that measures the percentage of time that a unit or group of units will encounter a forced outage and not be available when required. DAUFOP is a measure primarily used for gas turbines; however, this measure will be applicable to the thermal generating units.

Review)[24] will continue to be maintained. Capital investment will focus on maintaining, but not improving, these levels. Specific investments to improve start-up performance will not be made.

6) The order of unit decommissioning, when appropriate, will be Unit 3 (generating components only), Unit 1, and Unit 2.

7) Three fuel oil storage tanks are required for safe, cost-effective, and reliable operation. The potential to operate Holyrood TGS with two tanks has been studied and is not considered feasible due to fuel capacity and delivery constraints, and logistical and operational challenges associated with two-tank operation.[25]

8) Decommissioning costs are not included in the capital plan and are assumed to be funded by an Asset Retirement Obligation ("ARO") budget. A study on ARO was last completed in 2016 and updated in 2023 to provide updated estimates.

9) The proposed capital projects from the LECA and the refresh of the capital plan that was completed in 2024 will be considered in detail relative to the transition scenarios and assumptions. Changing assumptions and asset conditions will be evaluated and may result in deviations from the capital plan contained within the LECA. Project governance processes will be followed for all proposed projects.

10) Assets not classified as Holyrood TGS assets (i.e., Transmission and Rural Operations, or Telecontrol assets, etc.) are not included in the enclosed capital plan.

Non-critical assets will be monitored and may be allowed to deteriorate where such action does not increase risk to safe and reliable production. Data will be collected from inspections, online monitoring, and formal condition assessments and used to determine the optimal work plan for the assets in light of the changing role of the Holyrood TGS.

[24] Hydro's resource planning model does not differentiate between DAFOR and DAUFOP; rather, it requires the selection of a forced outage rate percentage. Please refer to "Reliability and Resource Adequacy Study – 2022 Update," Newfoundland and Labrador Hydro, October 3, 2022, vol. III, sec. 5.3.2, p. 25.
[25] For further details on the risk posed to Holyrood TGS by two-tank operation, please refer to "Application for Approval of Various Supplemental Capital Projects at the Holyrood Thermal Generation," Newfoundland and Labrador Hydro, June 6, 2022, sch. 2, sec. 3.2.

6.1 Depreciation Impacts of Holyrood TGS Life Extension

As Hydro expects continued operation of all three units at the Holyrood TGS through the Bridging Period until its capacity can be adequately replaced to ensure reliable operation for customers, capital expenditures for this facility to operate as a generator continue to be required. Depreciation is required to be calculated on an accelerated basis (i.e., monthly depreciation = capital investment ÷ remaining months of service life).[26]

7.0 Holyrood TGS 2026–2035 Operating Expenses

In Board Order No. P.U. 14(2004), Hydro was directed to file a ten-year plan of maintenance expenditures for the Holyrood TGS with its annual CBA until otherwise directed. The identified and expected system equipment maintenance ("SEM") expenditures for the years 2026–2035, inclusive, are provided in Appendix C.

The harsh operating environment, evolving production requirements, timing of replacement steam generation assets, a shift to post-steam operation and the age of units may trigger revision of the maintenance and capital plans to address unforeseen events. The plan currently reflects Hydro's commitment to have the Holyrood TGS fully available until March 31, 2030, and is based on the assumptions presented in Section 6.0; changes in operational outlook may result in changes in SEM expenses. Although expenses for major overhauls are included in capital, some variability in the annual SEM budget will remain as a result of the complexity of numerous components and integrated systems that form a fossil fuel-fired thermal electric generating system.

The SEM expenditures presented in Appendix C are based on the SEM budget planning information for 2026 and 2027. Future years, beyond 2027, are adjusted to reflect the Holyrood TGS's role using the best available information, including up-to-date maintenance tactics and known restoration and inspection work, to establish a ten-year forecast of the SEM projects for the Holyrood TGS.[27] Actual

[26] Due to the extension of the Holyrood TGS through the Bridging Period, Hydro submitted an application to the Board to extend the Holyrood Accelerated Depreciation Deferral Account. The extension of the account and related amendments were approved in Board Order No. P.U. 1(2024). In accordance with Board direction, Hydro filed a report on the activity and operation of the deferral account in its 2026 General Rate Application.

[27] In the maintenance plan, a single escalation factor of 1.079% per year has been used for 2028–2035 based on an average rate from Hydro's current corporate assumptions.

operation will vary based on the operating requirements of the Holyrood TGS, the results of inspections, and assessments of changing equipment conditions.

8.0 Alternative Approaches

In July 2024, Hydro filed its 2024 Resource Adequacy Plan, which indicated additional generating assets are required to be brought online to: (i) accommodate anticipated load growth on the Island Interconnected System; and (ii) ensure reliable system operation in the event of an extended outage of the Labrador-Island Link. Hydro has completed front-end engineering design for new supply additions and filed an application for additional generation in March 2025.[28] While Hydro is committed to transitioning from Holyrood TGS as a generating facility as soon as reasonably possible, there are no reasonable alternatives that would allow Hydro to transition from generation at Holyrood TGS until new sources of supply are available. Please refer to Hydro's 2024 Resource Adequacy Plan for further discussion of short-term supply options.

The 2024 Resource Adequacy Plan demonstrated that retirement of the Holyrood TGS cannot be fully enabled until both the Avalon CT and BDE Unit 8 are in service. The extension of the Holyrood TGS operations will result in combined fuel, capital, and operating costs exceeding $100 million per year.

The availability of the Holyrood TGS as a meaningful capacity backup for the Island Interconnected System by 2031 is becoming increasingly uncertain. Should Hydro decide to extend Holyrood TGS beyond March 31, 2030, more material capital investments than those listed herein would be required.

[28] "2025 Build Application – Bay d'Espoir Unit 8 and Avalon Combustion Turbine," Newfoundland and Labrador Hydro, March 21, 2025.

Appendix A

Holyrood Thermal Generating Station Asset Maintenance Philosophy



Maintenance Philosophy

Maintenance efforts aim to prevent functional failure and extend the operational life of assets, helping to minimize total asset lifecycle cost. The type and amount of maintenance applied is dependent on the criticality of the asset and the impact of failure on service delivery. Hydro seeks to balance the cost of maintenance against the cost of failure and its impact on safe, reliable service when applying maintenance strategies and tactics. There are four main types or categories of maintenance undertaken at the Holyrood TGS: preventive maintenance, corrective maintenance, boiler overhauls, and operating projects.

Preventive Maintenance

Hydro continues to use up-to-date maintenance techniques and practices to maintain plant efficiency, availability, and reliability. These include preventive, predictive, and condition-based maintenance techniques, which are usually referred to by the overall term of "preventive maintenance." The basic principle underlying this approach to maintenance is timely intervention to prevent imminent or catastrophic failure that may cause a substantial safety exposure, an extended unavailability of the unit or system, or an increase in cost.

Preventive maintenance comprises routine inspections, minor checks, and component replacement at specific time intervals to prevent failures that are known, or reasonably expected, to occur within a definable time or operating hour interval during the life of the equipment (e.g., generator brush wear, air and oil filter replacements). This also includes discarding equipment or components when it is less costly than repairing or refurbishing them.

Predictive maintenance involves routine testing of equipment to determine deterioration rates and initiating and carrying out repairs in a timely manner before a failure occurs (e.g., ultrasonic thickness checks on fluid lines to monitor erosion wear rates and non-destructive testing of boiler and turbine components to determine fatigue, wear or corrosion rates, and remaining life). Predictive maintenance items include such things as boiler and auxiliary equipment annual overhauls, wherein an assessment is made of components or subsystems that are only accessible during these overhauls.

There is also regular or continual monitoring of equipment operating parameters with a comparison of the results with optimum conditions to determine the most economic time to intervene and perform remedial work that is intended to return the equipment to optimum performance levels (e.g., air heater washes, generator winding insulation condition, and oil sampling and testing).

Since 2008, Hydro's Preventive Maintenance Program has been enhanced to include the extra costs associated with plant cleaning in areas where asbestos and heavy metals have been identified as potential health hazards.

Corrective Maintenance

In addition to the preventive maintenance techniques outlined, there are also corrective maintenance requirements. These include work performed to identify, isolate, and restore equipment, machines or systems to a level in which it can be operated safely and used for its intended purpose. The requirement of corrective maintenance may arise for various reasons, including failure, wear and tear, and harsh environments such as humid or salt-laden air. Examples of corrective maintenance include wear and tear on pumps, pipes, and valves in the main and auxiliary systems.

Boiler Overhauls

Boiler overhauls consist of the maintenance and refurbishment work required to ensure reliable boiler operation for the upcoming season. Boiler overhauls include packages of standard work, defined work, and as-found work. Standard work covers activities that are predictable and required on an annual basis due to normal operation and wear and tear. Defined work represents planned, specific activities that do not normally occur on an annual basis and addresses issues identified from prior condition inspections and trending. As-found work covers unforeseen issues identified during an ongoing boiler overhaul. In some cases, the nature of defined or as-found work meets the criteria for capitalization; in such cases, it is not included in SEM.

Operating Projects

Operating projects are low-cost repairs and annual inspections that are required to return structures and equipment to their original or near original operability, to maintain structural integrity, improve

efficiency, improve availability, and prevent or reduce environmental risks. Such projects include emissions monitoring and testing, and periodic basin cleaning in the Wastewater Treatment Plant.

Appendix B

Planned Capital Expenditures



Newfoundland and Labrador Hydro
2027 Capital Budget Application
Planned Capital Expenditures - Holyrood Thermal Generating Station[1]
($000)

	2026 and Prior Years	2027	2028	2029	2030	2031	Total
Steam Operation							
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2027) - Holyrood	-	10,119.7	-	-	-	-	**10,119.7**
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2028) - Holyrood	-	-	8,500.0	-	-	-	**8,500.0**
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2029) - Holyrood	-	-	-	7,000.0	-	-	**7,000.0**
Overhaul Turbine Valves - Unit 1 (2027) - Holyrood	-	7,973.1	-	-	-	-	**7,973.1**
Overhaul Turbine Valves - Unit 2 (2029) - Holyrood	-	-	-	8,500.0	-	-	**8,500.0**
Overhaul Turbine Valves - Unit 3 (2028) - Holyrood	-	-	12,000.0	-	-	-	**12,000.0**
Thermal In-Service Failures (2027)	-	3,836.4	-	-	-	-	**3,836.4**
Thermal In-Service Failures (2028)	-	-	3,881.0	-	-	-	**3,881.0**
Thermal In-Service Failures (2029)	-	-	-	3,981.0	-	-	**3,981.0**
Overhaul Marine Terminal Loading Arms (2027) - Holyrood	-	831.1	-	-	-	-	**831.1**
Overhaul Major Pumps and Associated Motors (2027) - Holyrood	-	3,355.2	-	-	-	-	**3,355.2**
Overhaul Major Pumps and Associated Motors (2028) - Holyrood	-	-	930.0	-	-	-	**930.0**
Overhaul Major Pumps and Associated Motors (2029) - Holyrood	-	-	-	420.0	-	-	**420.0**
Perform Level 2 Condition Assessment - Condenser and Condenser Tubes (2026-2027) - Holyrood	577.3	51.7	-	-	-	-	**629.0**
Refurbish Stage II Cooling Water Sumps (2028) - Holyrood	-	-	4,719.0	-	-	-	**4,719.0**
Steam Operation Total	**577.3**	**26,167.2**	**30,030.0**	**19,901.0**	**-**	**-**	**76,675.5**
Post-Steam Operation							
Install Plant Heating System (2028-2030) - Holyrood	-	-	4,887.3	6,858.9	3,354.9	-	**15,101.1**
Upgrade Exciter and Transformer - Unit 3 (2029) - Holyrood	-	-	-	4,000.0	-	-	**4,000.0**
Overhaul Generator - Unit 3 (2027) - Holyrood	-	3,823.8	-	-	-	-	**3,823.8**
Refurbish Water Treatment Systems (2026-2027) - Holyrood	524.5	936.3	-	-	-	-	**1,460.8**
Upgrade Fire System (2029) - Holyrood	-	-	-	700.0	-	-	**700.0**
Thermal In-Service Failures (2030)	-	-	-	-	700.0	-	**700.0**
Replace Parts of Stage 1: 129 Vdc Batteries and Battery Chargers (2026-2027) - Holyrood	229.1	100.1	-	-	-	-	**329.2**
Replace Two 129 V Chargers - Stage 2 (2029-2030) - Holyrood	-	-	-	100.0	75.0	-	**175.0**
Perform Level 2 Condition Assessment of Chemical Tanks (2031) - Holyrood	-	-	-	-	-	350.0	**350.0**
Post-Steam Operation Total	**753.6**	**4,860.2**	**4,887.3**	**11,658.9**	**4,129.9**	**350.0**	**26,639.9**
Grand Total	**1,330.9**	**31,027.4**	**34,917.3**	**31,559.9**	**4,129.9**	**350.0**	**103,315.4**

[1] Numbers may not add due to rounding.

Appendix C

Ten-Year System Equipment Maintenance Expenditures



Newfoundland and Labrador Hydro
2027 Capital Budget Application
Ten-Year System Equipment Maintenance Expenditures - Holyrood Thermal Generating Station[1]
($000)

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Generating Units										
Materials (inc. Boiler Overhauls)	1065	1050	1061	1072	81	82	83	84	85	86
Lubes, Chems, Gases	17	17	17	17	-	-	-	-	-	-
Contract Labour (inc. Boiler Overhauls)	4,581	4,561	4,610	4,659	189	191	193	195	197	199
Generating Units Total	**5,663**	**5,627**	**5,688**	**5,749**	**270**	**273**	**276**	**279**	**282**	**285**
Common Equipment										
Materials	561	563	569	575	285	288	291	295	298	301
Tools and Operating Supplies	30	24	25	25	14	14	15	15	15	15
Lubes, Chems, Gases	38	43	44	44	8	8	8	9	9	9
Contract Labour (Service Contracts)	2,132	1,701	1,720	1,738	476	481	486	491	496	502
Common Equipment Total	**2,760**	**2,332**	**2,357**	**2,383**	**783**	**792**	**800**	**809**	**818**	**827**
Environmental										
Materials	331	338	342	345	79	79	80	81	82	83
Tools and Operating Supplies	8	10	10	10	7	7	7	7	7	7
Lubes, Chems, Gases	373	383	387	391	172	174	176	178	180	182
Contract Labour (Service Contracts)	262	105	106	107	279	110	111	112	113	115
Environmental Total	**974**	**836**	**845**	**854**	**537**	**371**	**375**	**379**	**383**	**387**
Grand Total	**9,397**	**8,795**	**8,890**	**8,985**	**1,590**	**1,435**	**1,451**	**1,467**	**1,483**	**1,498**

[1] Numbers may not add due to rounding.

Schedule 4

Bay d’Espoir Hydroelectric Generating Station

Projected Capital Expenditures (2027–2035)



2027 Capital Budget Application

Bay d’Espoir Hydroelectric Generating Station

Projected Capital Expenditures (2027–2035)



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Appendix A: Full Asset Description

1.0 Background

In Board of Commissioners of Public Utilities ("Board") Order No P.U. 2(2026), the Board, directed Newfoundland and Labrador Hydro ("Hydro") to file, in conjunction with its 2027 Capital Budget Application ("CBA"), a report in relation to the Bay d'Espoir Hydroelectric Generating Station ("Bay d'Espoir" or "BDE"), addressing the capital plan for the facility over the 2027–2035 period. This report is provided in accordance with the direction of the Board.

This report includes detailed information related to any Major Projects[1] which are currently ongoing or within the 2027–2035 Capital Plan for Bay d'Espoir.

2.0 Introduction

Bay d'Espoir, shown in Figure 1, is a critical generating asset on the Island Interconnected System, with seven generating units in two powerhouses, providing an installed capacity of 613.4 MW and producing an average of 2,615 GWh[2] of energy each year.

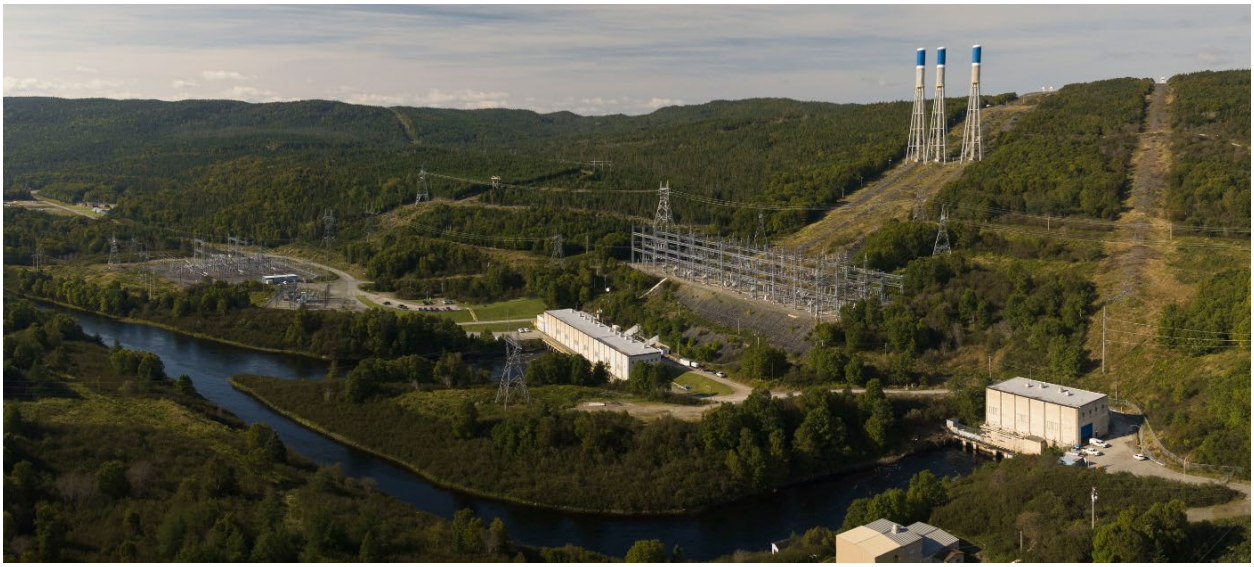


Figure 1: Bay d'Espoir

[1] For this document, the term 'Major Project' is generally used to describe regulated projects and programs with an anticipated cost of $50 million or greater under the accountability of Hydro's Major Projects department.
[2] Using the most recently available five-year average (2021–2025).

The location, total rated generating capacity, and in-service dates for each turbine generating unit are provided in Table 1.

Table 1: Installed Units at Bay d'Espoir

Unit Location	Unit Name	Rating (MW)	In-Service Date
Bay d'Espoir Powerhouse 1	BDE Unit 1	76.5	March 1967
	BDE Unit 2	76.5	June 1967
	BDE Unit 3	76.5	October 1967
	BDE Unit 4	76.5	September 1968
	BDE Unit 5	76.5	February 1970
	BDE Unit 6	76.5	March 1970
Bay d'Espoir Powerhouse 2	BDE Unit 7	154.4	December 1977

Hydro's Asset Management Program governs the life cycle of its hydraulic generation assets, including those located at Bay d'Espoir. This program monitors, maintains, refurbishes, replaces and disposes of assets to ensure the provision of safe, reliable, least-cost power in an environmentally responsible manner. Within this program, assets are grouped by five asset classifications: hydraulic generating units, hydraulic structures, reservoirs, site buildings and services, and auxiliary equipment. This report discusses the hydraulic generating units, hydraulic structures, site buildings and services, and auxiliary equipment at Bay d'Espoir. Reservoirs are considered to be outside the scope of this report.

The generating unit asset class, which pertains to the seven units located at Bay d'Espoir, consists of:

- Generators;
- Governors;
- Isolated phase buses;
- Spherical valves;[3]
- Turbines;

[3] Spherical valves are mainly employed in power plants where more than one generating unit shares a penstock, as is the case in Bay d'Espoir Powerhouse 1, with two units per penstock. As BDE Unit 7 is currently the single unit in Powerhouse 2, it does not have a spherical valve installed.

- Exciters; and
- Metering, monitoring, SCADA,[4] protection and control equipment.

Assets such as generator step-up transformers and generator circuit breakers are considered external to the generating station and are classified as terminal station assets. Details of Hydro's Terminal Station Asset Management Strategy and the life cycle strategy for these assets can be found in Appendix F to Schedule 1 of this application.

In addition to the components included in the hydraulic generating unit asset class, the following components from Hydro's hydraulic structures asset classification are considered essential to the operation of generating unit assets at Bay d'Espoir, as they are responsible for conveying water from the reservoir into the generating unit:

- Gates;
- Penstocks; and
- Surge tanks.

The reliable operation of Bay d'Espoir cannot be maintained without ensuring the appropriate capital investments are planned and executed on the site buildings and the services and auxiliary equipment contained within the station. These asset classifications are comprised of components including, but not limited to, powerhouse buildings, site access roads, station service, ancillary AC[5]/DC[6] electrical systems, and service/cooling water systems.

A functional description and further sub-classification of the infrastructure, equipment and systems within each asset classification is provided in Appendix A.

As assets have aged in recent years, significant expenditures have been proposed for Bay d'Espoir. It is expected that continued investment in these assets will be required in order to ensure the provision of reliable electrical service. This report sets out the capital plan for Bay d'Espoir, including anticipated and

[4] Supervisory Control and Data Acquisition ("SCADA").
[5] Alternating Current ("AC").
[6] Direct Current ("DC").

potential life extension activities, along with estimated expenditures for the 2027–2035 period. It also provides operational context and summarizes major refurbishment and replacement work which has already been completed.

3.0 Operational Overview

With an installed capacity of 613.4 MW, Bay d'Espoir is the largest hydroelectric generating site on the Island. The facility generates an average of 2,615 GWh of energy each year, which represents approximately 40% of Hydro's average annual Island energy sales.

The generating units are operated according to system conditions to balance the system load requirements while maintaining efficient water management strategies and respecting necessary operating conditions as outlined by the asset owners. As such, Bay d'Espoir provides both continuous base-load generation, as well as unit dispatch to meet the higher demand required at system peaks. In addition to providing generation supply, Unit 7, the largest capacity unit at Bay d'Espoir, also provides synchronous condensing capability to provide the necessary voltage support to the Island Interconnected System during periods when power generation from this unit is not required.

In January 2026, weather patterns caused frazil ice to form at Bay d'Espoir, forcing the plant to shut down for the first time in its history during a period of high electricity demand across the province. As the formation of frazil ice began, Bay d'Espoir units were derated and removed from service to protect the assets.[7] This ultimately resulted in the decision to proactively shut down all seven Bay d'Espoir generating units on January 21, 2026. Units 1–6 were returned to service on January 25, 2026, and Unit 7 was returned to service on January 31, 2026.

In response to changing environmental and operational conditions at Bay d'Espoir, Hydro is assessing alternatives to address this risk. Potential measures may include additional equipment to enhance physical monitoring, as well as the development of site-specific frazil ice procedures for Bay d'Espoir.

[7] Generating units are derated and/or removed from service to protect assets such as the intake structure, trash racks, penstocks, turbine runners, and associated mechanical and electrical equipment from ice blockage, vibration, and potential damage caused by ice accumulation and restricted flow. If the units are not derated and/or removed in an appropriate timeframe, the continued differential increase poses significant risk of trash rack collapse and subsequent catastrophic damage.

This assessment will determine what investments are prudent and appropriate. Hydro will provide an update to the Board as part of its 2026–2027 Winter Readiness reporting.

The continued reliable operation of assets located at Bay d'Espoir is critical to meet both current customer demand and future system energy requirements. To ensure these assets continue to be managed efficiently, Hydro plans and schedules capital investments in a manner which minimizes impacts to generation availability while maximizing the useful life of the assets, where practical.

4.0 Asset Management Approach

Hydro's Asset Management Program governs its hydraulic assets throughout their lifecycle. The program is structured in a manner which aims to anticipate future failures so that refurbishment or replacement activities can be incorporated into the proposed capital plan at the appropriate time. There may be circumstances where immediate, unplanned refurbishment or replacement is required due to the occurrence of an unanticipated failure or the recognition of an incipient failure. Such work is required to maintain the delivery of safe, reliable electricity at least cost, in an environmentally responsible manner. These instances will be included in Hydraulic Generation In-Service Failures projects through the 2027–2035 period, and will be reported in Hydro's annual Capital Expenditures and Carryover Report for that year.[8]

4.1 Condition Assessment Practices

Condition information on hydraulic generation assets is primarily obtained through operating-expensed time-based activities, or through capital-expensed overhauls and refurbishments. Overhauls and refurbishments require lengthy planned outages and a greater level of disassembly, with specialized inspections and testing of equipment, as well as detailed inspection of components that may not normally be accessible during operation.[9] The information obtained during these inspections is reviewed by Hydro to determine if any corrective action is required, or if third-party consultation is require to supplement internal expertise.

[8] Hydro notes that, although projects are set forth in a given year, there may be unforeseen circumstances, such as outage availability, that necessitate a change in scheduled completion. These changes will continue to be monitored and reported internally via established Management of Change processes.
[9] Further details are provided in Appendix A.

In addition to the routine inspections, Hydro may initiate condition assessments of existing equipment as it approaches the end of design life or when degradation has become apparent, to determine whether corrective action is necessary, or whether additional information is required to determine what is typically obtained through routine inspections. These condition assessments often involve the engagement of third-party consultants who perform the assessment with Hydro employees to ensure all necessary information is collected and analyzed to form the basis of future capital project scopes and justifications.

Based on the outcomes of routine inspections, overhauls, and condition assessments, corrective actions may be required immediately or may be executed at a future time. The timing of any required corrective actions is determined based on a variety of factors, including but not limited to reliability, safety, frequency of operation, asset criticality, operating constraints and geographic location.

5.0 Historical Investments

Bay d'Espoir has been providing safe, reliable, and environmentally responsible electricity, to the people of the province for more than 50 years. While significant future expenditures are planned for Bay d'Espoir, Hydro has undertaken refurbishment and replacement activities throughout the life of the assets to ensure the continued reliable operation of the system. Major work and upgrades completed[10] on Bay d'Espoir Units 1 to 7 over the past 30 years are provided in Table 2 through Table 8.[11] In addition to this work, Hydro's Hydraulic In-Service Failures program addresses situations where immediate refurbishment or replacement must be completed due to the occurrence of an actual failure, the identification of an incipient failure, or the presence of accelerated equipment deterioration. The expenditures made under this program annually are detailed in Hydro's Capital Expenditures and Carryover Report.[12]

[10] Completed as of December 31, 2025.
[11] Major work and upgrades include replacements, material upgrades, or work which resulted in asset life extension.
[12] Hydro's most recent Capital Expenditures and Carryover Report is included as Appendix B in Schedule 5 of this application.

Table 2: Major Work and Upgrades for Bay d'Espoir Unit 1

Year	Major Work/Upgrade
2025	Unit Overhaul (PM9) Completed
2021	Excitation Controls Replaced
2020	Unit Overhaul (PM9) Completed
2019	Slip Ring Replaced
2015	Excitation Transformer Replaced
2015	Auto-Grease System Replaced
2015	Thrust/Guide Bearing Coolers Replaced
2013	Air Gap Monitoring and Continuous Partial Discharge Monitoring Installed
2013	Upgraded Unit Protection
2013	Generator Rotor Poles Refurbished
2013	Stator Rewind
2013	Unit Overhaul (PM9) Completed
2008	Cooling Water Piping Replaced
2003	Spherical Valve Controls Upgrade Unit 1
2000	Generator Bearing Cooling Coil Installation
1999	Turbine Bearing Cooling Coil Installation
1998	Exciter Replacement
1996	Runner Replacement

Table 3: Major Work and Upgrades for Bay d'Espoir Unit 2

Year	Major Work/Upgrade
2025–2026	Unit Overhaul (PM9)[13]
2021	Excitation Controls Replaced
2019	Slip Ring Replaced
2018	Discharge Ring Machining Completed
2018	Unit Overhaul (PM9) Completed
2015	Excitation Transformer Replaced
2014	Thrust/Guide Bearing Coolers Replaced
2013	Auto-Grease System Replaced
2010	Air Gap Monitoring and Continuous Partial Discharge Monitoring Installed
2010	Upgraded Unit Protection
2010	Rotor Pole Refurbishment
2010	Stator Rewind
2008	Cooling Water Piping Replaced
2002	Spherical Valve Controls Upgrade Unit 2
2000	Generator Bearing Cooling Coil Installation
2000	Turbine Bearing Cooling Coil Installation
1997	Exciter Replacement

[13] This work was carried over into 2026. For further details, please refer to section 2.1 of Schedule 5, Appendix B.

Table 4: Major Work and Upgrades for Bay d'Espoir Unit 3

Year	Major Work/Upgrade
2023	Unit Overhaul (PM9) Completed
2021	Excitation Controls Replaced
2019	Slip Ring Replaced
2017	Discharge Ring Machining Completed
2015	Excitation Transformer Replaced
2015	Thrust/Guide Bearing Coolers Replaced
2014	Air Gap Monitoring and Continuous Partial Discharge Monitoring Installed
2014	Upgraded Unit Protection
2014	Rotor Pole Refurbishment
2014	Stator Rewind
2014	Unit Overhaul (PM9) Completed
2013	Auto-Grease System Replaced
2009	Unit Overhaul (PM9) Completed
2009	Cooling Water Piping Replaced
2004	Spherical Valve Controls Upgrade Unit 3
1999	Generator Bearing Cooling Coil Installation
1999	Turbine Bearing Cooling Coil Installation
1997	Exciter Replacement

Table 5: Major Work and Upgrades for Bay d'Espoir Unit 4

Year	Major Work/Upgrade
2022	Unit Overhaul (PM9) Completed
2021	Excitation Controls Replaced
2019	Slip Ring Replaced
2016	Discharge Ring Machining Completed
2016	Unit Overhaul (PM9) Completed
2015	Excitation Transformer Replaced
2015	Auto-Grease System Replaced
2014	Thrust/Guide Bearing Coolers Replaced
2012	Air Gap Monitoring and Continuous Partial Discharge Monitoring Installed
2012	Upgraded Unit Protection
2012	Generator Rotor Poles Refurbished
2012	Stator Rewind
2011	Unit Overhaul (PM9) Completed
2009	Cooling Water Piping Replaced
2001	Spherical Valve Controls Upgrade Unit 4
1998	Exciter Replacement

Table 6: Major Work and Upgrades for Bay d'Espoir Unit 5

Year	Major Work/Upgrade
2021	Excitation Controls Replaced
2021	Air Gap Monitoring and Continuous Partial Discharge Monitoring Installed
2021	Stator Rewind
2021	Unit Overhaul (PM9) Completed
2020	Upgraded Unit Protection
2019	Slip Ring Replaced
2015	Spherical Valve Bypass Valve Replaced
2015	Unit Overhaul (PM9) Completed
2015	Excitation Transformer Replaced
2014	Auto-Grease System Replaced
2010	Cooling Water Piping Replaced
2009	Unit Overhaul (PM9) Completed
2005	Spherical Valve Controls Upgrade Unit 5
2000	Turbine Bearing Cooling Coil Installation
2000	Generator Bearing Cooling Coil Installation

Table 7: Major Work and Upgrades for Bay d'Espoir Unit 6

Year	Major Work/Upgrade
2022	Air Gap Monitoring and Continuous Partial Discharge Monitoring Installed
2022	Stator Rewind
2022	Unit Overhaul (PM9) Completed
2021	Excitation Controls Replaced
2019	Slip Ring Replaced
2018	Upgraded Unit Protection
2016	Unit Overhaul (PM9) Completed
2015	Spare Excitation Transformer Replaced
2014	Auto-Grease System Replaced
2014	Excitation Transformer Replaced
2014	Refurbished Turbine Bearing
2010	Cooling Water Piping Replaced
2010	Unit Overhaul (PM9) Completed
2000	Generator Bearing Cooling Coil Installation
1999	Replace Cooling Water Pump #6
1998	Turbine Bearing Cooling Coil Installation

Table 8: Major Work and Upgrades for Bay d'Espoir Unit 7

Year	Major Work/Upgrade
2020	Upgraded Unit Protection
2019	Discharge Ring Machining Completed
2019	Unit Overhaul (PM9) Completed
2016	Vibration Monitoring System Installed
2016	Unit Overhaul (PM9) Completed
2015	Excitation Transformer Replacement
2010	Unit Overhaul (PM9) Completed
2004	Exciter Replacement

Hydro has also executed projects to renew and replace hydraulic structures, site buildings and services, or common auxiliary equipment, which are critical to the operation of generating unit assets at Bay d'Espoir. Major work and upgrades for these assets are provided in Table 9.

Table 9: Major Work and Upgrades for Hydraulic Structures, Site Buildings and Services, and Common Auxiliary Equipment

Year	Major Work/Upgrade
2025–Ongoing	Replace Powerhouse 1 Roof[14]
2025	Penstock 1 Life Extension[15]
2025	Replace Annunciator Panels – Phase 2 (Units 1, 2, and 3)
2025	Refurbish Intake 1
2025	Refurbish Surge Tank 1
2025	Powerhouse 1 Draft Tube Deck Refurbishment – Phase 2
2021	Intake 3 Refurbishment
2019	Powerhouse 1 Stop Log Refurbishment
2019	Powerhouse 1 Draft Tube Deck Refurbishment – Phase 1
2019	Surge Tank 1 Exterior Coating Refurbishment
2019	Site Facilities Building Constructed
2018–Present[16]	Penstock 3 Weld Refurbishment
2017–Present[17]	Penstock 2 Weld Refurbishment
2016–2024	Penstock 1 Weld Refurbishment
2016	Surge Tank 2 Interior and Exterior Coating Refurbishment
2015	Surge Tank 3 Interior Coating Refurbishment
2015	Powerhouse 2 Battery Bank 2 Replaced
2014	Surge Tank 3 Exterior Coating Refurbishment
2014	Intakes 1, 2, and 3 Control System Upgrade
2012	Powerhouse 2 Battery Bank 1 Replaced
2009	Powerhouse 1 Battery Bank 1 Replaced
2009	Powerhouse 1 Battery Bank 2 Replaced

6.0 Bay d'Espoir Capital Expenditure Outlook Overview

As presented in the previous section, significant life extension work has been completed at Bay d'Espoir to date, with a large portion of the generating unit and supporting assets already being in a refurbished or renewed operating condition. However, ongoing capital investment remains necessary throughout the future life of Bay d'Espoir to ensure the continued reliable operation of all assets. It is anticipated that various classifications of investments and expenditures will be required, including refurbishment, upgrade or replacement of failed or obsolete equipment, and general plant infrastructure work. Planned

[14] Project has carried over into 2026. For further information, please refer to Section 1.2.4 of Schedule 5.
[15] Project closeout will occur in 2026. For further information, please refer to Section 3.0 of Schedule 5.
[16] Hydro conducts annual penstock inspections and completes weld repairs as required.
[17] *Supra,* f.n. 15.

and anticipated capital expenditures for the 2027–2035 period can be separated into two categories: (i) those on the current five-year plan; and (ii) those residing on Hydro's longer-term capital plan project list. These include both programmatic investments and potential major unit-specific initiatives, including considerations related to Bay d'Espoir Unit 8.

Current and planned forecast expenditures for projects and programs relating to Bay d'Espoir as of May 31, 2026 are provided in the 2026 Capital Expenditures Overview, Appendix A of Schedule 5 to this application.

6.1 Capital Expenditure Outlook 2027–2031

Hydro's five-year capital plan for Bay d'Espoir has been developed consistent with its investment philosophy and includes details on the costs and timing of forecast asset replacements and refurbishments. The five-year plan is revised annually, considering evolving asset management practices, asset condition information, operational and system requirements, as well as operating environment factors.

Looking ahead to the 2027–2035 period, significant investment requirements are primarily for Bay d'Espoir, with the most significant expenditures including installation of Bay d'Espoir Unit 8, life extension of Penstock 2 and Penstock 3, and a life extension of the Unit 7 turbine. Hydro has developed the sequencing of the five-year capital plan to coordinate sustaining capital activities with the execution of Major Projects at Bay d'Espoir, as outlined in Table 10. This sequencing is intended to optimize the use of planned outages, minimize impacts to system operations, and improve overall cost efficiency.

Through the development of the five-year plan, Hydro has identified opportunities, where practicable, to integrate scope of work and leverage common access conditions, contractors, and site mobilization. For example, refurbishment of Intake 4 is scheduled to coincide with the Unit 7 refurbishment to optimize the Unit 7 outage window to complete associated Intake 4 work. This approach allows execution of the work to occur while the unit is already out of service, minimizing operational impact and avoiding the need for an additional outage.

Certain portions of the proposed planned work for Bay d'Espoir Unit 7 require coordination with other facilities located in Bay d'Espoir, most notably the proposed construction of Unit 8. The downstream

tailrace widening work necessary for the BDE Unit 8 project must be executed during a period of no flow from Unit 7. While the timing of the tailrace widening work is flexible and can be adjusted to suit the timing of the outage associated with the planned Bay d'Espoir Unit 7 Life Extension Project, a more significant schedule concern exists with respect to coordinating the work at Powerhouse 2. To minimize potential productivity and schedule impacts, it is important to align the Unit 7 life extension work with the planned start of Bay d'Espoir Unit 8 construction in 2028. If the Unit 7 life extension work is completed prior to the end of 2028, the potential interface impacts would be minimized. Similarly, replacement of the Powerhouse 2 roof has been aligned with Unit 8 construction activities to leverage the existing site setup and minimize operational disruption.

Additionally, Hydro has aligned major maintenance activities with planned outage windows associated with penstock work. The overhaul of Unit 5 is scheduled during the 2027 Penstock 3 outage, and the Units 3 and Unit 4 overhauls are coordinated with the Penstock 2 life extension program. Alignment of this work creates efficiency within established outage windows, while avoiding additional planned outages.

Table 10: Bay d'Espoir Capital Work Integration Major Milestones

Units/Penstocks	Planned Outage Window	Additional work to be completed
Unit 7 Life Extension Outage	Q2–Q4 2028	Intake 4 Refurbishment
Unit 8 Construction	2027–2031	Powerhouse 2 Roof Replacement
Penstock 3 Life Extension Outage	Q2–Q4 2027	Unit 5 Overhaul
Penstock 2 Life Extension Outage	Q2–Q4 2030	Unit 3 Overhaul Unit 4 Overhaul

The proposed sequencing reflects Hydro's prioritization of work based on operational, technical, and scheduling considerations, with the objective of executing required activities within available outage windows while maintaining system reliability. In the event of changes to any of the above-mentioned project plans, there may be subsequent impacts on other coordinated projects.

The anticipated five-year plan for assets associated with Bay d'Espoir is provided in Table 11, which includes projects approved in previous years with costs planned for 2027.

Table 11: 2027–2031 Planned Capital Work for Bay d'Espoir ($000)[18]

Project Title	2027	2028	2029	2030	2031
Fabricate and Install Stoplog Racks (2026–2027) – Bay d'Espoir	659.1				
Upgrade Spherical Valve Control (2026–2029) – Bay d'Espoir	219.6	358.3	460.3		
Refurbish Intake Access Road (2027–2028) – Bay d'Espoir	465.0	2,796.8			
Refurbish Draft Tube Deck - Phase 3 (2027–2029) – Bay d'Espoir	159.6	806.0	839.4		
Overhaul Unit 5 (2027) – Bay d'Espoir	3,397.9				
Refurbish Intake 4 (2026–2028) – Bay d'Espoir	3,069.4	3,069.4			
Section Replacement and Weld Refurbishment Penstock 3 – Bay d'Espoir	[redacted]	[redacted]			
Unit 7 Life Extension – Bay d'Espoir	[redacted]	[redacted]	[redacted]		
Installation of Bay d'Espoir Unit 8	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Overhaul Unit 6 (2028) – Bay d'Espoir		3,397.9			
Units 1-6 Spherical Valve Refurbishment (2028–2033) – Bay d'Espoir		1,500.0	1,500.0	1,500.0	1,500.0
Replace Powerhouse 2 Roof (2028–2029) – Bay d'Espoir		100.0	960.0		
Replace Battery Bank 1 and 2 - Powerhouse 1 (2028–2029) – Bay d'Espoir		200.0	300.0		
Refurbish Phase 1 Exterior Precast Concrete Panel – Powerhouse 1 (2028–2029)		100.0	1,459.6		
Station Service Switchboard Replacement – Powerhouse 1 (2028–2030) – Bay d'Espoir		150.0	1,000.0	500.0	
Section Replacement and Weld Refurbishment Penstock 2 – Bay d'Espoir			[redacted]	[redacted]	
Overhaul Hydraulic Units (2030) – Bay d'Espoir[19]				750.0	
Overhaul Hydraulic Unit 1 (2031) – Bay d'Espoir					1,300.0
Replace Battery Bank 1 - Powerhouse 1 (2031–2032) – Bay d'Espoir					100.0
Total Excluding Major Projects	**7,970.6**	**12,478.4**	**6,519.3**	**2,750.0**	**2,900.0**
Total[20]	**157,371.9**	**310,068.8**	**310,766.3**	**321,694.1**	[redacted]

[18] The Major Projects values represent a portfolio of project estimates generally considered Association for the Advancement of Cost Engineering Class 3 classifications. The "Authorized Cost" for each estimate includes management reserve, contingency, escalation, interest during construction and the base cost estimate, as applicable.
[19] The estimated cost for Overhaul Units 3 and 4 (2030) - Bay d'Espoir is lower than the overhaul projects associated with Units 5 and 6 due to differences in the scope of work. The overhauls of Units 5 and 6 include bushing replacements and refurbishment of the wicket gate linkages, representing a more extensive intervention. Units 3 and 4 have already benefited from similar capital investments in previous years, with portions of this work already complete. Consequently, the remaining scope for Units 3 and 4 is focused primarily on routine overhaul activities, resulting in comparatively lower costs.
[20] This total includes Major Project expenditures associated with BDE Unit 8 Installation, Unit 7 Life Extension, and the planned Life Extensions of Penstocks 2 and 3 for the 2027–2031 period.

With the exception of Major Projects,[21] those projects commencing in 2027 form part of the 2027 CBA, and information about each scope and estimate is provided in Schedule 7 to this application.

This plan includes $0.3 million of previously approved capital. Projects proposed for the 2027–2031 period is primarily required for renewal-driven capital, which is largely driven by the age and condition of Bay d'Espoir, resulting in end-of-service life for equipment and deterioration in the condition, causing reduced performance or reliability. Hydro's total capital plan for Bay d'Espoir during the 2027–2031 period, including capital expenditures associated with Major Projects, is approximately $1.3 billion.[22,23] The average annual capital expenditure for Bay d'Espoir in that period is [redacted], including Major Projects.

As outlined in Section 5.0, with the exception of Unit 7, the generating unit assets at Bay d'Espoir have previously undergone significant life extension activities; thus, the planned expenditures on the generating units through the 2027–2031 period consist of regularly scheduled overhauls that have expanded scopes to include necessary turbine small component replacements[24] and the addition of a spherical valve overhaul program is required to ensure continued safe, reliable and environmentally responsible operation, given the age of the generation assets. In addition, projects to address the end of service life are planned on assets such as the spherical valve controls, powerhouse roofs, and battery banks.

Considering hydraulic structure assets, planned investments include the continuation of Hydro's efforts to refurbish upstream and downstream assets associated with the intakes and draft tubes, as well as the necessary Level 2 Condition Assessments, which form the basis of future capital expenditures.

6.2 Capital Expenditure Outlook 2032–2035

In addition to a detailed five-year capital plan, Hydro also maintains longer-term asset management plans for Bay d'Espoir. These plans contain both recurring time-based capital interventions, such as six-

[21] Including BDE Unit 8 Installation, Unit 7 Life Extension, and the planned Life Extension of Penstock 3.
[22] *Supra*, f.n. 18.
[23] This total includes Major Project expenditures associated with BDE Unit 8 Installation, Unit 7 Life Extension, and the planned Life Extensions of Penstocks 2 and 3 for the 2027–2031 period.
[24] Small component replacements include, but are not limited to, wicket gate greased bushing replacement with greaseless, wicket gate linkage refurbishment and servomotor overhauls.

year unit overhauls, in addition to various stand-alone projects which are forecast to occur in a future year. As these projects are beyond the detailed five-year planning cycle, the exact timing of the proposal to the Board and the associated execution schedule has not yet been determined. During the annual capital planning cycle, as the five-year plan is updated and adjusted, identified scopes from the longer-term plan are scrutinized and added to the five-year plan, as appropriate. At present, the projects identified for the 2032–2035 period is outlined in Table 12.

Table 12: 2032–2035 Planned Capital Work for Bay d'Espoir ($000)[25,26]

Project Title	Estimated Project Costs
Overhaul Unit 2 – Bay d'Espoir	500.0
Data Acquisition and Trend Monitoring System Upgrades – Bay d'Espoir	2,250.0
Rotor Rewind Unit 5 – Bay d'Espoir	5,500.0
Rotor Rewind Unit 6 – Bay d'Espoir	5,500.0
Overhaul Units 3 and 4 – Bay d'Espoir	700.0
Overhaul Units 5 and 6 – Bay d'Espoir	700.0
Overhaul Unit 7 – Bay d'Espoir	350.0
Penstock 4 Level 2 Condition Assessment – Bay d'Espoir	206.2
Replace Station service Switchboard PLC – Bay d'Espoir	1,200.0
Replace Battery Bank 2 Powerhouse 2 – Bay d'Espoir	250.0
Replace Public Address System – Powerhouse 1 and 2 – Bay d'Espoir	825.0
Replace Flow Measuring Devices – Bay d'Espoir	500.0
Refurbish Mechanical Governors – Bay d'Espoir	250.0

The identified projects primarily represent time-based capital interventions on the assets, with the addition of the rotor rewinds for Units 5 and 6 as well as refurbishment and replacement activities for auxiliary assets, which are identified as approaching end-of-service life in the 2032–2035 period. The plan currently reflects an investment of approximately $18.2 million over the 2032–2035 period, with an average annual capital expenditure for Bay d'Espoir of approximately $4.6 million.

Hydro notes that, as cost estimates are refined for future years of the plan, projected expenditures are subject to change. In addition, following the completion of planned and future condition assessments, as

[25] Costs are presented in 2026 dollars. Costs will be escalated to the appropriate years when the timeline of execution is determined.
[26] There are no planned Major Projects in Bay d'Espoir beyond 2032 at this time.

well as through ongoing routine maintenance and inspection activities, additional projects may be identified and included in the proposed project lists, where appropriate. Such additions will result in increases to the proposed expenditures noted above. Hydro will incorporate any necessary changes to the plan using internally established Management of Change processes.

7.0 Conclusion

Bay d'Espoir is a critical generating asset on the Island Interconnected System that has been providing safe, reliable, environmentally responsible energy consistent with the least cost to the people of the province for over 50 years. To ensure the continued reliable operation of Bay d'Espoir, Hydro has historically planned and executed major work on assets, as required, and continues to utilize its Asset Management Program to complete necessary inspections and assessments to ensure refurbishment or replacement activities can be incorporated into the proposed capital plan at an appropriate time. In the first 50 years of the life of the facility, significant investment has been made to ensure generating assets are maintained and refurbished according to good utility practice, including but not limited to, ongoing six-year turbine and generator overhauls, the completion of turbine runner replacements, generator rewinds and excitation upgrades as well as various other necessary investments.

Looking ahead to the 2027–2035 period, significant investment requirements remain for Bay d'Espoir, with the most significant expenditures related to Major Projects including Bay d'Espoir Unit 8 Installation, Unit 7 Life Extension, and the planned Life Extensions of Penstocks 2 and 3; the rewinds of Units 5 and 6 rotors; spherical valve refurbishment; intake access road realignment; and completion of the Intake 4 refurbishment. The continuation of ongoing time-based sustaining activities, and refurbishment and replacement of end-of-life assets will also be required through 2035 and beyond. Hydro remains committed to completing regular routine inspections, overhauls, and condition assessments to ensure that the most accurate asset information is available for consideration in the management of the province's power grid.

Appendix A

Full Asset Description



Hydraulic Generating Units

Generator

A generator is an electric rotating machine that transforms mechanical power from a hydraulic turbine into electric power.

Stator Assembly

A stator consists of a core and a frame; it is the stationary part of a machine that serves as both a magnetic circuit and a supporting member. The core is made up of sheets of electrical steel; the sheets, which are 0.35–0.5 mm thick and insulated with varnish, are formed into stacks and fastened in the cast or welded frame. Stator windings fit into slots made in the core. The stator is cooled with surface air coolers, which are heat exchangers that have cooling water flowing through, which cools the hot air blown around the stator.

Rotor Assembly

The rotor consists of a fabricated spider, laminated rim, field poles and windings, a brake ring and collector rings.

Thrust and Guide Bearing

The thrust and guide bearing combination on the generator sustains axial and lateral loading and prevents axial and lateral movement. The bearing consists of a segmented guide bearing, thrust block, rotating ring, segmented spring-supported thrust bearing, base ring, oil reservoir, cooling coils, alarm devices, and a high-pressure oil injection system for start-up (if equipped).

Cooling Water System

The cooling water system supplies water to the thrust and guide bearing cooling coil to cool the oil reservoir. The cooling water also supplies the surface air coolers in the generator to cool the stator and rotor by air circulation within the generator.

Governor

The governor serves to keep the speed of the hydro unit constant in order to maintain the system's frequency of 60 hertz. Any change in load or other operational disturbances will cause the governor to

open or close the wicket gates to allow more or less water to maintain the constant speed of the hydro unit.

Governor Speed Generators

Speed control is one of the primary functions of a governor. On mechanical governors, a set of rotating flyballs, opposed by a spring, controls the position of a valve. The valve controls the flow of oil to a servomotor that controls the wicket gates. Any change in speed will cause the valve to be moved off its centered position, making the gates open or close, and changing the unit's speed. Modern electronic governors control the gates by monitoring electronic signals from speed sensors.

Governor Pump

The pump used by the governor to port oil through the governing system.

Governor Piping System

The network of pipes required to deliver the governor oil to the desired location.

Accumulator Tank

An accumulator tank stores oil for the governor system and is pressurized by air.

Servomotor Assembly

The servomotors are hydraulically actuated pistons, controlled by the governor, that move the linkages connected to the wicket gates to allow water regulation to the hydraulic generating unit to maintain a constant speed.

Isolated Phase Bus

Isolated phase bus is the current-carrying conductors used to transmit large currents. For Hydro's generation sites, it is the means used to carry the current from the generators to the step-up transformers. The conductors are individually contained within housings to provide electrical and physical protection and to minimize the possibility of faults.

Disconnect Switch

Disconnect switches are used to electrically isolate the isolated phase bus either for maintenance activities or troubleshooting. Proper operation of these switches is essential for the establishment of a safe work environment and for reliable and secure system operation.

Grounding Switch

Grounding switches are used to provide a safe and secure electrical connection between a piece of equipment and ground. Proper grounding of equipment is essential for the establishment of a safe work environment.

Buswork

Buswork is the current carrying conductors which provide connections for the electrical circuits.

Main Inlet Valve

Main inlet valves are mainly employed in power plants with more than one generating unit sharing a common penstock. When one penstock is used to supply two or more generating units, these valves are installed on each unit to provide isolation from the penstock water supply. This allows the operation of one unit while the other unit is down for maintenance or in standby. Most of Hydro's main inlet valves are of the spherical valve type.

Turbine

A turbine is a rotary machine that converts kinetic energy and potential energy of water into mechanical work. Components of the turbine include:

Runner

Flowing water is directed onto the blades of a turbine runner creating a force on the blades. Since the runner is spinning, the force acts through a distance, which is the definition of work. In this way, energy is transferred from the water flow to the turbine.

Draft Tube

In power turbines, a diffuser tube is installed at the exit of the runner, known as the draft tube.

Guide Bearing

The guide bearing on the turbine sustains lateral loading and prevents lateral movement. The bearing consists of a segmented guide bearing, oil reservoir, cooling coils, and instrumentation to monitor bearing temperature and oil levels within acceptable ranges.

Auto-Greasing System

The auto-greasing system delivers controlled amounts of lubricant to multiple locations on a hydraulic generating unit while the machine is in operation.

Turbine Shaft and Coupling

The turbine shaft is the portion of the hydraulic unit's shaft that is connected to the turbine. The shaft coupling joins the generator shaft to the turbine shaft.

Scroll Case

A spiral-shaped steel intake guiding the flow into the wicket gates located just prior to the turbine.

Headcover Assembly

The headcover is the top stationary part of a hydraulic turbine that encloses the system.

Wicket Gates and Linkages

Adjustable elements that control the flow of water from the scroll case into the turbine passage by the linkages connected to the servomotors.

Excitation

Excitation Transformer

The excitation transformer is a part of the excitation system. It is used to convert the generator terminal voltage to a lower voltage, which supplies the rectifier. The excitation system creates the DC energy for the rotating magnetic field in the generator to enable the conversion of mechanical energy into electrical energy. Without an excitation transformer, a generating unit is not able to produce electricity.

Field Breaker

The field breaker is a circuit breaker used to isolate the power supply between the excitation system and the generator rotor. The field breaker performs switching actions to complete, maintain, and interrupt current flow under normal or fault conditions. The reliable operation of the field breaker through its fast response and complete interruption of current flow is essential for the protection of the excitation system.

Metering, Monitoring, Protection, SCADA and Control

Ground Cubicle

Minimizes fault damage incurred by generators and maintains sufficient fault detection to improve power system reliability.

Auto Control Panel

The auto control panels are where control or monitoring instruments are displayed. This is where operators interface with the generating unit.

Synchronizing Panel

Synchronization panels are mainly designed and used to meet power system requirements. These panels function both manually and with an automatic synchronizing function for one or more generators or breakers. They are widely used in synchronizing generators.

Temperature and Frequency Control Panel

This panel displays the temperature and frequency of the hydro unit.

Time and Frequency Clock

Highly sensitive equipment used to measure the time and frequency of the unit.

Oscillogragh

An oscillogragh is a device for recording oscillations, especially those of an electric current.

Voltage and Megawatt Panel

This panel displays the voltage and megawatt output from the hydro unit.

Recorder

The recorder records the voltage and megawatt readings of the unit.

Control Cables and Junction Boxes

Control cables connect various circuits for the operation of each generator. Junction boxes are also located along cable paths where it is practical to terminate cables from various sources.

Vibration Monitoring System

Hydro Unit Systems

For Hydro units, vibration sensors are mounted on the critical bearings and wired to the plant's computer system or to a dedicated vibration monitoring system. Two alarm levels (soft and trip) are then set to alert the operator that maintenance attention is needed, or in the case of a trip alarm, to shut the machine down to prevent failure.

Handheld Units

Handheld vibration units use magnetic vibration sensors that are directly connected to the equipment to monitor vibration and record data. This data can then be downloaded to a computer for analysis.

Data Acquisition System

This system measures an electrical or physical phenomenon such as voltage, current, temperature, pressure, or sound with a computer. The system consists of sensors, measurement hardware, and a computer with programmable software.

Hydraulic Structure

Substructure

The substructure is the underlying or supporting structure, such as the concrete foundation.

Superstructure

The superstructure is the components of a hydraulic structure that are on top of the substructure. This includes components such as the structural steel, hoists and motors for the gates.

Gates

The structure gates are designed to hold back water. In a spillway, the water is on one side, and the other side is typically dry when the gates are closed. Depending on the function of the particular structure, the gates are opened to move water from one reservoir to another, or to spill water from the reservoir when the water level exceeds the maximum safe level.

Stoplogs/Master Logs

The stoplogs are a set of wooden or steel logs that are put in place by a crane or hoist with the help of a lifting device called the master log. The stop logs act as a temporary measure to isolate the water side of the gate for maintenance.

Gate Hoist

A gate hoist is a device used for lifting or lowering a gate by means of a drum or lift wheel around which a wire rope or chain wraps.

Gate Rollers, Seals, and Embedded Parts

The gate rollers are attached to the gate and roll along the embedded steel in the gains.

Heating Systems

There are three heating systems that can be used in a structure; the first is a gain heater that heats the roller path on the side of the structure and ensures the roller path is free of ice during the winter. Sill heaters heat the bottom of the gate where it sits on the concrete substructure so that the gate does not freeze to the bottom during winter. The other heating system is on the gate itself and is called gate heaters. Gate heaters are used to ensure that ice does not form inside the gate and that the water side of the gate is free of ice during the winter.

Control Systems

Control systems are typically computer systems designed to control gate systems remotely. Some older technology electronic controllers are used for specific, simple control features.

De-Icing Systems

In conjunction with the heating systems, other systems are strategically employed to combat ice around gates. Water uplifters are used to agitate the water close to the surface of the gate to inhibit the formation of ice. Bubbler systems use compressed air to lift warmer water at lower levels in the reservoir to prevent the formation of ice cover or to remove ice build-up on trash racks.

Penstock

A penstock is a channel for conveying water to a turbine, commonly constructed of steel, wood, or rock.

Surge Tank

A surge tank is a tank connected to a penstock carrying reservoir water. It is intended to neutralize sudden changes of pressure in the flow by filling when the pressure increases and emptying when it drops to minimize the effects of water hammer in a penstock.

Heating Systems

The surge tank heating system prevents the stagnant water in the surge tank from freezing in the winter. If the surge tank water freezes, water can't flow freely to avoid water hammer.

Relief Valves

Relief values are an alternative to surge tanks to minimize the effects of water hammer in a penstock. The use of a surge tank or a relief valve is determined during the design stage of a new unit, and it is typically not possible to change the design after initial construction.

Coating Systems

Metal penstocks are coated to protect the steel and welds from corrosion due to the water inside and the elements outside of the penstock or surge tank.

Drainage Systems

Drain pipes are installed under the penstocks in the bedding material to collect any leakage from the penstocks as well as surface water and any leakage from the intakes/dams.

Water Level Systems

Water level systems are located at hydraulic structures to provide information to operations to make informed decisions about water management and other operating conditions.

Reservoirs

Dams and Dykes

Hydro currently operates more than 100 dams, dykes and hydraulic structures on the island of Newfoundland. Hydro dams are constructed to hold back water and raise its level in order to contain water for electricity generation. The majority of Hydro's dams are embankment-type structures, with the highest structure being 63m high.

Power Canals

Power canals are typically a dyke lined canal developed to convey water from one reservoir to another or a reservoir to an intake structure.

Passive Overflow Spillways

Passive overflow spillways are dams which are built to spill water from a reservoir at a specific elevation. Overflow spillways in our Hydro system are constructed of rock fill with steel sheet pile cores, concrete or timber crib.

Control Weirs

Control weirs are low-head concrete overflow spillways which maintain the water elevation upstream of the weir to within a specified range.

Fuse Plugs

Fuse plugs are sections of dams that are constructed of earth materials and designed to fail in a controlled manner without damaging adjacent larger, more critical dams.

Power Tunnels

Power tunnels convey water through rock, from an intake structure to a generating station.

Diversion Tunnels

Diversion tunnels divert water around the work site.

Dam Instrumentation

This instrumentation monitors the dam design criteria. Examples of dam instrumentation include piezometers, inclinometers, survey monuments and anemometers. This condition monitoring instrumentation is used to measure the movement of the dam structure and water content in the dam.

Public Safety Around Dams Control Measures

Public safety risks are determined by completing a risk assessment in accordance with the Canadian Dam Association Guidelines for Public Safety Around Dams. Control measures are then recommended to reduce the risk to the public. These measures include such items as signage, fencing, audible or visual alarms, booms, buoys, operational changes and public education.

Site Buildings and Services

Water Distribution System

A water distribution system is a system for the collection, transmission, treatment, storage and distribution of water from source to site locations.

Piping

The network of pipes required to deliver the site water to the site facilities.

Pumps

The driver of the water from the source is by pumps.

Storage Tanks

Storage tanks hold water to provide a consistent water pressure at site facilities and a volume of water that can be used for firefighting.

Filters

To remove sediment and fine particles from the water filtration systems are used.

Fuel Storage and Distribution System

Fuel Storage and Distribution Systems are site-specific systems to have fuel and distribution methods on site.

Diesel Fuel Tank

Tanks that house diesel fuel only.

Gasoline Fuel Tank

Tanks that house gasoline fuel only.

Jet Fuel Tank

Tanks that house jet fuel only.

Fuel Dispenser and Pumps

Apparatus used to dispense and meter the fuel.

Powerhouse Building

Buildings used to house hydraulic generating units and the auxiliary mechanical and electrical equipment required for the generation of electricity.

Vertical Lift Equipment Doors

Vertical lift doors are large doors that allow access to the powerhouse building for large materials and equipment. The doors are operated manually or electrically by a counterweight arrangement.

Roof

The roof is the structure forming the upper covering of a powerhouse building.

Substructure

The substructure is the underlying concrete support of the powerhouse.

Superstructure

The superstructure is the building that is placed upon the substructure. This includes the concrete and steel that make up the walls of the building.

Service Buildings

Service buildings are any other building on site that supports Hydro's generation of electricity. This includes warehouses, maintenance buildings, training facilities, site accommodations, and security facilities.

Substructure

The substructure is the underlying concrete support of the service building.

Superstructure

The superstructure is the building that is placed upon the substructure.

Septic System

A septic system stores and distributes sewage. This includes a septic tank, septic field and all associated distribution piping.

Garage Doors

A garage door is a large door on a service building that opens either manually or by an electric motor. These are typically overhead doors similar to automotive garages or residential attached garages.

Exhaust Systems (Welding)

Welding exhaust systems are ventilation systems in maintenance buildings that specifically circulate fresh air using ducts and fans in the area to ensure worker safety.

Ventilation Systems

Ventilation systems circulate fresh air using ducts and fans.

Security Systems

A security system detects and issues an alarm due to an intrusion or unauthorized entry. Security systems are also used to prevent unauthorized access to Hydro facilities.

Helicopter Pad ("Helipad")

A helipad is a landing area or platform for helicopters and powered lift aircraft. While helicopters and powered lift aircraft are able to operate on a variety of relatively flat surfaces, a fabricated helipad provides a clearly marked hard surface away from obstacles where such aircraft can land safely.

Site Fencing and Gate Controls

All sites have fencing and or gates with control to maintain site security and public safety.

Parking Lots and Stairways

The parking lots and stairways are areas for staff, contractors and the general public to park vehicles for safe access to Hydro's facilities.

Site and Access Roads

Site and Access Roads are used to allow access to specific locations, such as generating stations, terminal stations, hydroelectric dams, and all Hydro locations.

Drainage

Drainage is the sloping of land to divert water away from a specific area.

Culverts

Culverts allow the passage of water through/under a road.

Bridge

Bridges are structures used to span sections of site roads over a stream, river, valley, canal, or any obstacle preventing access to the site location.

Common Auxiliary Equipment

Station Service

A station service switchboard is an electrical panel used to supply low-voltage power to the critical and auxiliary electrical equipment necessary for the operation of the generating units. The protective

devices included within the station service switchboards are required to monitor the flow of electricity and to interrupt this flow, in a selective and timely manner, in the event of an electrical fault.

Station Service Transformers

Station Service Transformers convert electricity from higher voltages to voltages used in the ancillary AC/DC electrical system.

Circuit Breakers

Circuit breakers perform switching actions to complete, maintain, and interrupt current flow under normal or fault conditions. The reliable operation of circuit breakers is essential for the protection of the critical and auxiliary equipment supplied by the station service switchboard.

Disconnects and Switches

Disconnects and switches are used to electrically isolate equipment for maintenance activities or troubleshooting. Proper operation of these switches is essential for the establishment of a safe work environment and for reliable and secure system operation. Faulty and/or malfunctioning disconnects or switches that do not operate properly create a safety hazard.

Grounding Transformers

Grounding transformers are used to provide a ground path for the station service systems. This ground path ensures that the system's neutral is at or near ground potential. The establishment of a suitable ground enables safe operation of a grounded electrical system and allows protective devices (like relays or low-voltage circuit breakers) to detect and isolate line-to-ground faults.

Instrumentation Transformers

Instrument transformers are used to provide inputs to protection, control and metering equipment required for protection of the electrical equipment supplied from the station service system.

Surge Arrestors

Surge arresters provide overvoltage protection of electrical equipment from lightning and switching surges.

Power Cables and Junction Boxes

Cables to connect station service to switchgear and electrical panels, and ancillary equipment. Junction boxes are also located along cable paths where it is practical to terminate cables from various sources.

Ancillary AC/DC Electrical System

Switchgear and Panels

Switchgear and Panels are devices which are used to distribute electricity to cables. This equipment protects the cables and equipment from overload and short circuits.

Power Cables and Junction Boxes

Distributes electricity to equipment

Battery Banks and Chargers

Provides DC electricity for DC powered equipment.

Diesel Standby Generator

A diesel generator is the combination of a diesel engine with an electric to generate electrical energy. Prime-power diesels provide power to sites that are not connected to an interconnected distribution system. Emergency diesels are on standby at various locations within Hydro's system to ensure system reliability.

Engine

This is the diesel engine used to drive the genset.

Generator

The generator converts mechanical energy from the engine to electricity.

Enclosure

Some diesels are located outside and require an enclosure to house the unit away from the weather.

Cranes

Cranes are machines used for moving heavy objects, typically by suspending them from a projecting arm or beam.

Overhead

An overhead crane consists of parallel runways with a traveling bridge spanning the gap. A hoist, the lifting component of a crane, travels along the bridge.

Monorail

A traveling crane suspended from a single rail.

Gantry

Gantry cranes are a type of crane built atop a gantry, which is a structure used to straddle an object or workspace.

Wire Rope

Wire rope is a length of rope made from wires twisted together as strands.

Fire Protection and Detection System

A fire alarm system has a number of devices working together to detect and warn people through visual and audio devices when smoke, fire, carbon monoxide or other emergencies are present.

Transformer Deluge System

A transformer deluge fire sprinkler system is an automated water spray system where the water distribution piping is equipped with open spray nozzles for discharging over a transformer. Deluge systems are connected to a water supply through a deluge valve that is opened by the operation of a smoke or heat detection system.

Fire Panels

A fire alarm control panel, or fire alarm control unit, is the controlling component of a fire alarm system.

Generator Deluge System

A generator deluge fire sprinkler system is an automated water spray system where the water distribution piping is equipped with open spray nozzles for discharging within the generator. Deluge systems are connected to a water supply through a deluge valve that is opened by the operation of a smoke or heat detection system.

Inergen System

Inergen agent is a mixture of three naturally occurring gases: nitrogen, argon, and carbon dioxide. This system releases the Inergen agent when the system is activated and floods the contained room with the agent to extinguish the fire by decreasing the oxygen concentration below levels required to sustain combustion.

Office Sprinkler System

An office space sprinkler system is a system for protecting a building against fire by means of overhead pipes which convey water to heat-activated outlets.

Passive Fire Protection

Passive fire protection is an integral component of the three components of structural fire protection and fire safety in a building. This protection is used to contain fires or slow the spread of fires.

Powerhouse Public Address System

A public address system is an electronic sound amplification and distribution system with a microphone, amplifier and loudspeakers, used to allow a communication within a loud powerhouse.

Compressed Air System

Compressed air is air kept under a pressure that is greater than atmospheric pressure.

Air Receiver Tank

This is the tank where the pressurized air is stored until it is required.

Air Dryer

An air dryer is used for removing water vapor from compressed air. The process of air compression concentrates atmospheric contaminants, including water vapor. This raises the dew point of the

compressed air relative to free atmospheric air and leads to condensation within pipes as the compressed air cools downstream of the compressor.

Excessive water in compressed air, in either the liquid or vapor phase, can cause a variety of operational problems for equipment using the compressed air. These include freezing of outdoor air lines, corrosion in piping and equipment, malfunctioning of pneumatic process control instruments, fouling of processes and products, and more.

Compressors

A machine used to supply air at increased pressure.

Service/Cooling Water System

Service or cooling water is the water removing heat from a machine or system.

Pumps

Cooling water pumps distribute the water from the source to the system.

Basket Strainers

Cooling water is sourced from the tailrace or other unfiltered sources, and the basket strainer is a closed vessel with a cleanable screen element designed to remove and retain foreign particles down to 0.001 inch diameter from various flowing fluids

Piping, Valves, and Controls

The piping, valves and controls are required components of the cooling water system.

Domestic Water System

Domestic water use is water used for indoor and outdoor site purposes such as washrooms and kitchens.

Drainage/Unwatering System

This system handles the removal of water from the hydraulic generating unit draft tube for maintenance.

Sump Pumps

The pumping system required to remove the water.

Water Level System

Water level or gauge height or stage is the elevation water in a reservoir.

Air Conditioners

Air conditioners control the temperature in many locations for personnel and equipment. The units also provide humidity control in rooms with sensitive electrical equipment like communication rooms.

Ventilation System

Ventilation systems circulate fresh air using ducts and fans.

Polychlorinated Biphenyl Waste Oil and Waste Oil Tanks

These are specifically marked oil tanks that only contain waste oil. Once the tanks are full, a waste disposal company will come to the site to empty the tanks. Polychlorinated biphenyl waste oil has to be disposed of properly outside of the province; this is why there are two types of waste oil storage.

Lube Oil Storage

Lubrication oil storage includes laydown areas for the 200-litre drums that are located at most generating stations, carrying devices for these drums, and smaller storage containers that are used for top-ups when required. The proper storage for lube oil is important to equipment health because a proper container will limit any airborne particulates or any moisture from contaminating the oil.

Schedule 5

2026 Capital Expenditures Overview



2027 Capital Budget Application

2026 Capital Expenditures Overview



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Appendix A: Capital Programs and Projects Variance Summary

Appendix B: Capital Expenditures and Carryover Report for the Year Ended December 31, 2025

1.0 Variance Explanations

As per the provisional Capital Budget Application ("CBA") Guidelines[1] set forth by the Board of Commissioners of Public Utilities ("Board"), Newfoundland and Labrador Hydro ("Hydro") is required to provide a mid-year report on actual capital expenditure variances that exceed the approved total program or project budget by more than 10% and $100,000.

Variance explanations are provided herein for projects and programs that are:

- Budgeted over $750,000 where forecasted expenditures have exceeded the approved budget by more than $100,000 and 10%, on a total project/program basis;
- Budgeted under $750,000 and are forecast to exceed $750,000, on a total project/program basis; or
- Cancelled or significantly reduced in the scope of work.

As this is a mid-year report, variances are based on focused management and re-forecasting efforts and are subject to change throughout the year as the projects and programs proceed.[2] Actual variances at the completion of each project and program will be discussed in the 2026 Capital Expenditures and Carryover Report[3] when annual expenditures are final. As requested by the Board, a copy of the 2025 Capital Expenditures and Carryover Report[4] is provided as Appendix B to this report.

This report does not include expenditures related to Major Projects currently before the Board.[5]

[1] "Capital Budget Application Guidelines (Provisional)," Board of Commissioners of Public Utilities, January 2022.
[2] The 2026 Capital Projects and Programs Variance Summary for all 2026 programs and projects as of May 31, 2026, is provided as Appendix A.
[3] As per Board Order No. P.U. 2(2026), Hydro's 2026 Capital Expenditures and Carryover Report is to be filed by April 1, 2027.
[4] "Capital Expenditures and Carryover Report for the Year Ended December 31, 2025," Newfoundland and Labrador Hydro, April 1, 2026.
[5] In Board Order No. P.U. 17(2025), the Board approved Hydro's application to proceed with $47.4 million of early execution work for the Avalon Combustion Turbine and Bay d'Espoir Unit 8 projects. In Board Order No. P.U. 7(2026), the Board approved an additional $29.3 million of additional early execution work for the Avalon Combustion Turbine. In Board Order No. P.U. 21(2026), the Board approved $5.6 million of additional early execution work for Bay d'Espoir Unit 8. Hydro's expenditures and forecast information for these projects are reported separately to the Board monthly. For the most recent information on Hydro's expenditures and forecast, please refer to "Major Projects Monthly Update," Newfoundland and Labrador Hydro, June 16, 2026, app. B.

1.1 Renewal

1.1.1 In-Service Failures (2026)[6]

Table 1: Program Variance – In-Service Failures (2026) ($000)

Program	Budget	Expenditures And Forecast	Forecasted Variance
Distribution	6,114.9	6,706.2	591.3
Thermal	3,823.7	3,823.7	-
Hydraulic	2,660.3	2,660.3	-
Terminal Station	3,291.8	3,291.8	-
Diesel	817.0	2,973.7	2,156.7
Gas Turbine	500.1	500.1	-
Transmission	183.4	183.4	-
Telecommunications[7]	123.6	123.6	-
Total	**17,514.8**	**19,671.5**	**2,748.0**

In-Service Failures programs are one-year programs that include refurbishment and replacement work due to actual failures, the identification of incipient failures, or the determination of faster-than-anticipated equipment deterioration for Hydro's assets. The procurement of capital spares required to support such work is also included under the In-Service Failures programs.[8] Budget estimates for In-Service Failures programs are based on historical averages, along with Hydro's experience and engineering judgment. As many of these programs have been introduced in recent years, they have limited historical data; Hydro expects that it may take several years of implementation to determine an appropriate baseline estimate for annual in-service failures expenditures.

The forecasted variance for the Diesel In-Service Failures program is attributed to more scopes of work required in 2026 than anticipated at the time of the original budget estimate, and the nature of failures requiring more material expenditure to address. The most material scope of work contributing to the variance is work required to address the failure of the mobile genset Unit 2108 at the Charlottetown Diesel Generating Station. The Original Equipment Manufacturer ("OEM") determined that the failed

[6] While all but one individual In-Service Failure program did not meet the threshold for reportable variance, all 2026 In-Service Failures programs are listed herein for completeness.
[7] The Telecommunications In-Service Failures program is classified as General Plant in Hydro's 2026 CBA; however, it is presented in the Renewal In-Service Failures (2026) section of this report for completeness.
[8] The Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights program includes distribution system upgrades and the installation of light-emitting diode ("LED") street lights in addition to in-service failures.

genset is not repairable. As the unit is required for plant reliability, Hydro ordered a replacement genset that is expected to be received and installed in 2026.

Further details on material expenditures for In-Service Failure programs will be provided in the 2026 Capital Expenditures and Carryover Report.

1.1.2 Overhaul Turbine and Valves – Unit 3 (2025) – Holyrood

Table 2: Program Variance – Overhaul Turbine and Valves – Unit 3 (2025) – Holyrood ($000)

Budget	Expenditures and Forecast	Forecasted Variance
15,975.9	23,362.0	7,386.1

This one-year program (2025) carried over and was completed in 2026. This annual program is for the completion of scheduled overhauls for the three generating unit turbines on a nine-year cycle, turbine valves on a three-year cycle, and generators on a six-year cycle. The scope of work for the 2025 program included the overhaul of the turbine and turbine valves for Unit 3,[9] including the remediation of a crack in the lower steam chest[10] of the turbine.

The inspection and overhaul of the turbine and turbine valves and the remediation of the lower steam chest were substantially completed in 2025. During the program discovery phase, damage was discovered on a turbine rotor diaphragm that required additional time to refurbish at the OEM's facility. The diaphragm refurbishment work was completed, but this unplanned refurbishment delayed the expected return to service of Unit 3. Failure of the turbine hall overhead crane at the Holyrood Thermal Generating Station ("Holyrood TGS"), which is required to reassemble the turbine, further delayed Unit 3's expected return to service to the first quarter of 2026. Unit 3 returned to service on February 14, 2026, upon completion of the major overhaul of the steam turbine and valves.

The forecasted variance in overall program expenditures is primarily attributed to the unforeseen additional refurbishment scope. The original program budget was based on historical turbine and valve overhaul expenditures. The full extent of refurbishment work can only be determined after the unit is

[9] The Unit 3 generator overhaul is not due to be performed until 2027 and is therefore not included in the 2025 program scope.
[10] A turbine steam chest is a valve casing for the turbine control valves.

removed from service and disassembled for inspection during program execution. In this case, the extent of the required refurbishment was greater than originally estimated. The following additional refurbishment work was identified and completed in 2025:

- High-pressure and intermediate-pressure turbine casing refurbishment, including the replacement of the turbine casing studs;
- Remediation of additional cracks discovered in the turbine lower steam chest; and
- Turbine rotor diaphragm, governor, and control valve refurbishment at the OEM's facility.

The forecasted variance in overall program expenditures is also attributed to additional expenditures to expedite unit reassembly and commissioning to return Unit 3 to service as quickly as possible. The additional refurbishment work described herein, combined with the turbine hall overhead crane being out of service for approximately seven weeks, resulted in the program work extending beyond the start of the winter operating period. To minimize the impact on winter readiness, Hydro implemented a second shift (night crew) starting in mid-November 2025, resulting in additional contract and internal labour expenditures. No viable alternatives were identified for this program, and Hydro proceeded with execution.

1.1.3 Refurbish Control Structure (2021–2025) – Ebbegunbaeg

Table 3: Project Variance – Refurbish Control Structure (2021–2025) – Ebbegunbaeg ($000)

Budget	Expenditures and Forecast	Forecasted Variance
17,679.0	23,954.0	6,275.0

This five-year project (2021–2025) has carried over into 2026. The project scope of work includes the refurbishment of the three water control gates and associated equipment at the Ebbegunbaeg Control Structure. The remaining scope of work in 2026 is to replace the screw stem hoist systems for Gates 1 and 3 that carried over to 2026 due to late delivery of the new equipment, and to fabricate and supply a second master log for the stop logs.[11]

[11] Stop logs are modular barriers (typically beams) with seals that are stacked vertically into concrete slots to block water flow at a hydraulic structure. The master log is a stop log that is equipped with rigging attachment points so that a crane can lift it and engage the other stop logs and lower them into the vertical concrete slots.

The forecasted variance in overall project expenditures is attributed to:

- Higher than originally estimated tendered contract pricing for refurbishment work completed on Gates 1 and 2 in 2023 and 2024, respectively;
- Greater extent of required refurbishment of the lintels[12] for Gates 1 and 2 identified during the detailed inspection, compared to the budget allowance for this work;
- The forecasted cost increase to refurbish Gates 1 and 3 screw hoists and the upstream stoplog gains for all three bays in 2026;
- Fabrication and supply of a second master log with synchronized hooking capabilities in 2026, which reduces the risk of jamming the master log and/or stop logs during usage; and
- Greater internal engineering, construction management, and project management effort required during the construction and commissioning of the work from 2023 to 2026.

No viable alternatives were identified for this project, and Hydro is proceeding with execution.

1.1.4 Upgrade Power Transformers (2025–2026)

Table 4: Program Variance – Upgrade Power Transformers (2025–2026) ($000)

Budget	Expenditures and Forecast	Forecasted Variance
1,985.8	2,732.2	746.4

This two-year program (2025–2026) commenced in 2025. The program scope includes the refurbishment of power transformers at several terminal stations. The forecasted variance in overall program expenditures is attributed to additional planned transformer refurbishment activities in 2026, including:

- Happy Valley Transformer T4 and Rocky Harbour Transformer T1 on-line oil dehydrator installations, paused in 2025 for further analysis to determine if the equipment is still required, and transferred from the Upgrade Power Transformers (2024–2025) program.

[12] A gate lintel is a horizontal structural beam that spans the top of the opening to support the concrete wall above it and to provide a gate sealing surface.

- Peter's Barren Transformer T1 dissolved gas analyzer installation and on-line tap changer overhaul, transferred from the Upgrade Power Transformers 2024–2025 program to coordinate with other planned work at Peter's Barren in 2026.
- Upper Salmon Transformer SS1 high voltage bushings replacement required to comply with federal polychlorinated biphenyl ("PCB") regulations.

No viable alternatives were identified for this program, and Hydro is proceeding with execution.

1.1.5 Renew Circuit Breakers (2025–2026)

Table 5: Program Variance – Renew Circuit Breakers (2025–2026) ($000)

Budget	Expenditures and Forecast	Forecasted Variance
2,661.0	2,944.0	283.0

This two-year program (2025–2026) commenced in 2025. The program scope includes the refurbishment or replacement of select 69 kV, 138 kV, and 230 kV circuit breakers.

Hydro is forecasting an increase in the planned number of circuit breakers to be replaced and refurbished under this instance of the program. The original budget estimate was based on the replacement of one circuit breaker and the refurbishment of five circuit breakers, as follows:

- Wabush Terminal Station 69 kV Circuit Breaker B4L34 replacement;
- Buchans 69 kV Circuit Breaker B2L64 refurbishment;
- Stephenville 230 kV Circuit Breaker B1L09 refurbishment;
- Upper Salmon 230 kV Circuit Breaker L34L63 refurbishment;
- Western Avalon 230 kV Circuit Breaker B1T1 refurbishment; and
- Western Avalon 230 kV Circuit Breaker B1T2 refurbishment.

As part of a budget update in the 2026 CBA,[13] two additional circuit breaker replacements previously scheduled in 2025 as part of the Renew Circuit Breakers (2024–2025) program are also planned to be completed in this program:

- Hardwoods 66 kV Circuit Breaker B8T3 replacement: This breaker is now planned for replacement in 2026 to better align with long-term asset planning criteria.
- Howley 138 kV Circuit Breaker B1L43 replacement: Previously scheduled for refurbishment, this breaker will now be replaced in 2026. Replacement is required as the OEM has determined that the operating mechanism is obsolete and unable to be refurbished.

The forecasted variance in overall program expenditures is attributed to the increase in the number of circuit breakers to be refurbished since the 2026 CBA budget update. Four additional circuit breaker refurbishments have been transferred to this program from the Renew Circuit Breakers (2024–2025) program, with planned execution in 2026:

- Deer Lake 230 kV Circuit Breaker B3L47 refurbishment and Massey Drive 230 kV Circuit Breaker B1L48 refurbishment, carried over from 2025 due to late delivery of parts from the OEM.
- South Brook 138 kV Circuit Switcher L22T1 refurbishment, carried over from 2025 due to the unavailability of the mobile substation required for the work.
- Wabush Terminal Station 46 kV Circuit Breaker B4T7 refurbishment, carried over from 2025 due to cancellation of the OEM representative's travel to Wabush due to service issues at the Wabush Airport; the OEM was unable to reschedule a flight within their availability window in 2025.

No viable alternatives were identified for this program, and Hydro is proceeding with execution.

1.1.6 Replace Unit 2047 (2021–2023) – Ramea

Table 6: Project Variance – Replace Unit 2047 (2021–2023) – Ramea ($000)

Budget	Expenditures and Forecast	Forecasted Variance
2,436.8	3,167.4	730.6

[13] "2026 Capital Budget Application," Newfoundland and Labrador Hydro, July 15, 2025, vol. I, sch. 5, s. 2.7.

This three-year supplemental project (2021–2023) has carried over into 2026. The project scope includes the replacement of Unit 2047 in the Ramea Diesel Generating Station with a new 500 kW, 1,800 rpm diesel genset and the replacement of the associated exhaust stack, radiator, aftercooler, switchgear, and breaker. The scope of work also includes the installation of fuel coolers and upgrades to some existing protection and control equipment, and the existing cooling system.

The new genset and associated new mechanical and electrical components were installed and placed in service in 2024. Challenges with the availability of protection and control engineering and construction resources resulted in the carryover of a portion of the automation and communications work to 2025 and 2026. Most of the remaining automation and communications scope of work was completed in 2025. Modification of the engine hall programmable logic controller ("PLC"), representing approximately 3% of the overall project scope, has carried over into 2026.

The forecasted variance in overall project expenditures is attributed to the following required activities that were not included in the budget estimate:

- Additional labour and travel expenditures for resources to complete the construction and commissioning activities;
- An external engineering consultant for the commissioning of switchgear modifications;
- Replacement of the silencer for the new unit to reduce noise in the community; and
- Modifications of the powerhouse hydronic heating system and fire alarm system for compatibility with the new genset.

No viable alternatives were identified for this project, and Hydro is proceeding with execution.

1.1.7 Overhaul Diesel Units (2026)

Table 7: Program Variance - Overhaul Diesel Units (2026) ($000)

Budget	Expenditures and Forecast	Forecasted Variance
2,353.7	3,011.5	657.8

This one-year program (2026) commenced in 2026. The program scope is to overhaul diesel gensets when they reach or exceed the recommended number of operating hours between overhauls.

The forecasted variance in the 2026 overall program expenditures is attributed to:

- Higher than originally estimated materials costs for the seven planned diesel unit overhauls; and
- The advancement of materials procurement into 2026 for three units scheduled for overhaul in 2027 due to increased lead times: Paradise River Diesel Unit 2094, Postville Diesel Unit 2096, and Rigolet Diesel Unit 2101. The procurement of replacement engines for these three units was advanced to 2026 to mitigate plant reliability risk through the winter of 2026–2027, and the new engines are planned to be installed in 2027.

No viable alternatives were identified for this program, and Hydro is proceeding with execution.

1.1.8 Replace Instrument Transformers (2025–2026)

Table 8: Program Variance – Replace Instrument Transformers (2025–2026) ($000)

Budget	Expenditures and Forecast	Forecasted Variance
468.9	1,396.0	927.1

This two-year program (2025–2026) commenced in 2025. The program scope includes the replacement of instrument transformers in various terminal and generating stations.

The program scope originally anticipated the replacement of 5 instrument transformers; 13 instrument transformers were added to the scope, primarily from the 2024–2025 program:

- The construction portions of 10 instrument transformer replacements were added to this program from the Replace Instrument Transformers (2024–2025) program.
  - Hardwoods 230 kV B2L42 A-, B-, and C-phase current transformers, due to outage unavailability in 2025;
  - Holyrood 230 kV B12L18 A-, B-, and C-phase current transformers, due to resource unavailability in 2025;
  - Wabush Terminal Station 230 kV Breaker B1L23 A-, B-, and C-phase current transformers, due to vendor equipment delivery delays; and

- Stony Brook 230 kV Bus B1 B-phase potential transformer, due to installation issues in 2025 that require correction.

- Three replacements were added to this program due to the possible presence of PCBs in the oil for these sealed units:
  - Churchill Falls 230 kV Transmission Line L24 A-phase capacitive voltage transformer; and
  - Churchill Falls 230 kV Transmission Line L23 A- and C-phase capacitive voltage transformers.

The forecasted variance in overall program expenditures is attributed to the increase in the number of instrument transformers to be replaced, as described herein.

No viable alternatives were identified for this program, and Hydro is proceeding with execution.

1.1.9 Replace Diesel Gensets (2024–2026)

Table 9: Program Variance – Replace Diesel Gensets (2024–2026) ($000)

Budget	Expenditures and Forecast	Forecasted Variance
3,418.5[14]	4,416.9	998.5

This three-year program (2024–2026) commenced in 2024. The program scope of work includes:

- Replacement of Unit 2085 at the Nain Diesel Generating Station with a new 1,600 kW, 1,800 rpm diesel genset;
- Replacement of Unit 3033 at Makkovik Diesel Generating Station with a 545 kW, 1,800 rpm diesel genset;
- Design, procurement, and installation of associated equipment for both gensets, including exhaust stack, radiator, aftercooler, switchgear with breaker, and all other equipment necessary to facilitate the proper function of the new units; and

[14] The total program budget of $3,418,470 included in 2026 CBA was incorrect and should have been $4,916,100. The program scope is expected to be completed at a final cost that is less than the correct original budget.

- Upgrade some existing protection and control equipment for both new gensets, including additions to the motor control centre PLC cabinet, modifications to the main PLC, and modification/testing of PLC logic.

1.1.10 Diesel Genset Replacement Program (2023–2025)

Table 10: Program Variance – Diesel Genset Replacement Program (2023–2025) ($000)

Budget	Expenditures and Forecast	Forecasted Variance
2,408.2	3,457.1	1,048.9

This three-year program (2023–2025) has carried over into 2026. The program scope of work includes:

- Replacement of Unit 2053 and the replacement or upgrade of associated equipment at the Hopedale Diesel Generating Station; and
- Replacement of Unit 2056 and the replacement or upgrading of the associated equipment at the St. Brendan's Diesel Generating Station, which was completed in 2023.

In 2023, Hydro issued a tender for the new 1,067 kW, 1,200 rpm genset planned for Hopedale; tendered pricing was significantly higher than originally estimated. This tender was cancelled. An updated analysis of alternatives concluded that a genset between 700 kW and 850 kW at 1,800 rpm proved to be the least-cost alternative. Hydro changed the scope of work to the lower-cost alternative and extended the schedule into 2026, as reflected in a budget update in the 2024 CBA.[15]

After the budget update in the 2024 CBA, Hydro anticipated improvements to the schedule and budget, and a further update was provided in the 2025 CBA. At that time, the expected delivery time of the genset was shorter than previously anticipated, which would allow construction to commence in 2024 and be completed in 2025; however, the new unit failed during factory acceptance testing, and it was not delivered in time to allow for installation to begin in 2024.

[15] "2024 Capital Budget Application," Newfoundland and Labrador Hydro, rev. September 21, 2023 (originally filed July 12, 2023).

The genset was installed, and the associated equipment upgrades and replacements were completed in 2025. The program has carried over into 2026 to address the following additional scope that was identified during execution:

- Installation of a hydronic heating system for the Hopedale Diesel Generating Station that will utilize waste heat from the diesel genset to heat the powerhouse. This system is expected to lower the overall generating station operating expenditures and reduce the environmental impact through a reduction in the quantity of diesel fuel consumed to power electric heaters. The materials for the heating system were procured, and the system was installed in 2024 and 2025. The installation of the controls for the hydronic heating system is expected to be completed in 2026.
- Installation of a new Hospital Plus Grade silencer[16] to address noise concerns for the surrounding community that were identified following the genset installation. The new silencer is expected to be installed in 2026.

The forecasted variance in overall program expenditures is attributed to:

- Scope additions of a hydronic heating system and Hospital Plus Grade silencer;
- Unforeseen requirement to utilize contractor resources for the electrical scope of work due to the unavailability of internal forces; and
- Higher than originally estimated project management, engineering and construction expenditures.

1.1.11 Refurbish Intake 2 (2025–2026) – Bay d'Espoir

Table 11: Project Variance – Refurbish Intake 2 (2025–2026) – Bay d'Espoir ($000)

Budget	Expenditures and Forecast	Forecasted Variance
3,353.8	4,092.7	738.9

[16] A Hospital Plus Grade silencer is a high-performance exhaust silencer providing superior noise attenuation for critical, ultra-low noise environments such as hospitals and residential areas.

This two-year project (2025–2026) commenced in 2025. The project scope is to refurbish the Bay d'Espoir Intake 2, including the replacement or refurbishment of several main components: the intake gate, embedded parts, superstructure, and hoist.

The forecasted variance in overall project expenditures is attributed to:

- Higher than originally estimated contract pricing for the refurbishment of Intake 2. The variance between the budget estimate and tendered pricing is partly attributable to the inclusion of on-site machining requirements in the Intake 2 contract technical specification, based on lessons learned from the Refurbish Intake 1 (2024–2025) - Bay d'Espoir project completed in 2025; and
- The requirement to complete concrete rehabilitation and coating restoration at select locations on Intake Structures 1, 2, and 3, identified during project execution.

No viable alternatives were identified for this project, and Hydro is proceeding with execution.

1.1.12 Perform Level 2 Condition Assessment – Unit 7 Intake and Draft Tube (2025) – Bay d'Espoir

Table 12: Project Variance – Perform Level 2 Condition Assessment – Unit 7 Intake and Draft Tube (2025) – Bay d'Espoir ($000)

Budget	Expenditures and Forecast	Forecasted Variance
471.5	1,122.7	651.2

This one-year project (2025) carried over into 2026. The project scope is to perform a Level 2 Condition Assessment of Bay d'Espoir Intake 4 and the Powerhouse 2[17] draft tube structure.

Most of the field inspection activity for this condition assessment was unable to proceed in 2025 due to the unavailability of stop logs required for dewatering the equipment for inspection. The existing stop logs that can be used for any of the seven generating units at Bay d'Espoir were in use on other units for their annual outages in 2025. An additional set of stop logs was purchased in 2025 on a separate

[17] Powerhouse 2 houses Bay d'Espoir Unit 7, and Intake 4 is the intake for Unit 7.

project[18] and was expected to be available for this condition assessment work; however, they could not be used in 2025 due to design issues. This prevented the condition assessment of the Intake 4 head gate, gains, and embedded parts from being completed in 2025. The design issue is being resolved by the supplier under warranty.

Additionally, the start of the 2025 planned outage for Bay d'Espoir Unit 7 was delayed due to constraints on the Island Interconnected System, preventing the completion of work utilizing a remotely operated vehicle ("ROV"). The consultant was unable to align their availability with the revised outage dates, preventing the condition assessment of the Unit 7 draft tube gains and embedded parts by use of an ROV. The consultant completed the condition assessment work in 2025 that was possible without the use of stop logs and a generation outage.

The forecasted variance in overall project expenditures is attributed to:

- Higher than originally estimated consultant pricing to perform the Level 2 Condition Assessment study following an open call for bids; and
- Additional consultant costs anticipated for remobilization in 2026 to complete the remaining inspections.

No viable alternatives were identified for this project, and Hydro is proceeding with execution.

1.1.13 Replace Annunciator – Phase 2 (2024–2025) – Bay d'Espoir

Table 13: Project Variance – Replace Annunciator – Phase 2 (2024–2025) – Bay d'Espoir ($000)

Budget	Expenditures and Forecast	Forecasted Variance
481.6	1,162.8	681.2

This two-year project (2024–2025) has carried over into 2026. The project scope is to replace obsolete annunciator panels for Bay d'Espoir Units 1 to 6 with a Power Line Carrier-based system. Project carryover into 2026 is attributed to protection and control engineering and construction resource limitations in 2024 and 2025. The Bay d'Espoir Units 1, 2, and 3 annunciator panels were replaced in

[18] The stop logs were procured on the under $750,000 project "Procure Stop Logs Units 1–7 (2025) – Bay d'Espoir," as reported in "Quarterly Regulatory Report for the Quarter Ended March 31, 2025," Newfoundland and Labrador Hydro, rev. August 5, 2025 (originally filed June 30, 2025), tab 1, sec. 6.1, Table 13.

2025, and the replacement of the Units 4, 5, and 6 annunciator panels is expected to be completed in 2026.

The forecasted variance in overall project expenditures is attributed to additional project management, engineering, procurement, and construction costs to address evolved design philosophy and scope of work refinement, including:

- An increase in Power Line Carrier hardware requirements, network architecture and panel sizes to accommodate future planned generating unit and spherical valve controls upgrades;
- An increase in Power Line Carrier hardware and cabling requirements for the transfer of transducers and gauges for generating unit monitoring, trips, and alarms from the existing turbine-generator panel to the new Power Line Carrier-based system;
- Additional network switches and cabling to provide redundancy in communications links/paths, for improved reliability; and
- Replacement of cabling from existing field devices to the annunciator panels that were determined to contain PCBs.

No viable alternatives were identified for this project, and Hydro is proceeding with execution.

1.1.14 Overhaul Turbine Valves and Generator – Unit 2 (2026)

This one-year project (2026) commenced in 2026. The project scope of work is to inspect and complete associated refurbishments of the Holyrood Unit 2 turbine valves and generator.[19]

There was no reportable variance identified for this project as of May 31, 2026.[20] However, there is an emerging indication that expenditures greater than the approved budget will be required. During the discovery phase of the project, the turbine bearing oil deflectors were removed for inspection and bearing Babbitt material was observed in the lubrication oil. Based on this finding, the turbine and generator service provider recommended that Hydro disassemble the bearings and inspect for damage. When opened for inspection, damage to the bearing Babbitt was confirmed on T1, T2, and T3 turbine

[19] The Unit 2 turbine overhaul is not due to be performed until a future year and is therefore not included in the 2026 originally planned program scope.
[20] This 2026 Capital Expenditures Overview includes variance explanations for projects and programs that have known variances with internally approved change management documentation as of May 31, 2026.

bearings and bearing refurbishment is required. The bearing Babbitt damage indicates that the Unit 2 turbine and generator rotor have a mechanical alignment issue that will need to be resolved before returning the unit to service. This will require the following additional scope of work:

- Disassembly of the high-pressure and intermediate-pressure turbine outer and inner casings;
- Removal of the low-pressure turbine casing;
- Removal of the turbine rotor;
- Refurbishment of the turbine bearings;
- Inspection of the steam path components in the high-pressure and intermediate-pressure turbine sections for damage; and
- Re-alignment of the turbine and generator rotor and machining of the coupling.

Preliminary estimates for these additional scopes of work total $2,641,999.

Upon removal of the turbine rotor, additional findings were discovered. A guide pin from the Stage 2 diaphragm key block was found sheared, causing damage to both the upper and lower diaphragm halves. A second bolt on the same stage backed off and became lodged between the diaphragm halves, resulting in additional damage. The sheared pin travelled through the unit and damaged multiple rotor blades.

The cost and schedule impacts of these recent findings are not yet known, and Hydro continues to work with Mitsubishi Power to develop a plan for repair and to maintain the project schedule.

Additional scopes of work may be identified as Hydro continues to complete the planned equipment inspections of the turbine, turbine valves and generator.

No viable alternatives were identified for this project, and Hydro is proceeding with execution.

1.1.15 Replace Fuel Storage Tank (2026) – McCallum

This one-year project (2026) commenced in 2026. The project scope of work is to replace the fuel storage tank located on the provincial wharf with two appropriately sized fuel tanks in a new location at Hydro's Diesel Generating Station in McCallum.

There was no reportable variance identified for this project as of May 31, 2026.[21] However, there is an emerging indication that expenditures greater than the approved budget will be required. During development of the engineering design, it became evident that the planned project alternative is no longer viable. Upon further assessment by Hydro's structural engineer, it was determined that an adequate foundational support cannot be assured at the location proposed for the new tank. Due to the steep and rocky coastal terrain, Hydro has now determined that the only viable alternative is to place a new steel support structure and tank set in the same footprint as the existing tank, which will require the installation of temporary fuel storage.

As a result, construction start is now delayed to 2027. Hydro will issue a request for proposals for the removal of the existing tank, and the design and construction of the new tank and associated support structure. A specialized contractor is required to address requirements for bolting a new structure to the exposed bedrock considering coastal environment conditions, geological capacity of the exposed bedrock, and construction environment in a tidal zone.

Hydro will inform the Board of the tendered pricing and construction schedule prior to award.

1.2 General Plant

1.2.1 Upgrade Water and Fire Suppression Systems (2023–2024) – Bishop's Falls

Table 14: Project Variance – Upgrade Water and Fire Suppression Systems (2023–2024) – Bishop's Falls ($000)

Budget	Expenditures and Forecast	Forecasted Variance
3,240.0	5,800.0	2,560.0

This two-year project (2023–2024) has carried over into 2026. The project scope of work includes:

- Installation of a new water supply line from the town near the Botwood Highway (Route 350) close to the Bishop's Falls Complex;

[21] This 2026 Capital Expenditures Overview includes variance explanations for projects and programs that have known variances with internally approved change management documentation as of May 31, 2026.

- Installation of dedicated domestic water and firewater distribution lines; and
- Upgrade of the fire suppression system in the main building of the Bishop's Falls Complex.

The project has carried over into 2026 due to the increased duration required for the project design phase, and longer than originally expected lead times for some of the new components. During the engineering design, a fire hydrant flow test produced unusually low flow rate and pressure values from the town's water supply, resulting in significant challenges with sizing the new fire pump. This delayed the sizing and procurement of the generator, load bank, and panel, leading to a delayed start of construction. Significant construction progress was made in 2025, but the project has carried over for completion in 2026.

The forecasted variance in overall project expenditures is attributed to procurement and construction expenditures that are higher than the original budget estimate. It was determined during the engineering design that a new pumphouse building and a backup fire pump generator are required.

No viable alternatives were identified for this project, and Hydro is proceeding with execution.

1.2.2 Replace Light- and Heavy-Duty Vehicles (2024–2026)

Table 15: Program Variance – Replace Light- and Heavy-Duty Vehicles (2024–2026) ($000)

Budget	Expenditures and Forecast	Forecasted Variance
6,761.3	8,240.6	1,479.3

This three-year program (2024–2026) commenced in 2024. The program scope is to replace light- and heavy-duty vehicles and includes accessorizing, as required, based on the purposes of the vehicles. The original budget estimate was based on the planned replacement of 30 light-duty vehicles and 8 heavy-duty vehicles. As part of a budget update in the 2026 CBA,[22] the scope was expanded to include:

- Procurement of an additional eight light-duty vehicles due to unforeseen in-service failures; the failed vehicles did not merit repair costs, given their age, high usage, and/or condition; and

[22] "2026 Capital Budget Application," Newfoundland and Labrador Hydro, July 15, 2025, vol. I, sch. 5, s. 2.3.

- One heavy-duty vehicle that was ordered as part of the Replace Light- and Heavy-Duty Vehicles (2022–2024) program but was not received until 2025.

Since the budget update in the 2026 CBA, the scope was further expanded to include:

- Two additional heavy-duty vehicles that were ordered as part of the Replace Light- and Heavy-Duty Vehicles (2022–2024) program but were not received until 2025–2026.

The forecasted variance in overall program expenditures is attributed to the additional two heavy-duty vehicles, as explained herein.

No viable alternatives were identified for this program, and Hydro is proceeding with execution.

1.2.3 Install Ultra-Fast DC Electric Vehicle Chargers (2023–2025) – Supplemental

Table 16: Project Variance – Install Ultra-Fast DC Electric Vehicle Chargers (2023–2025) – Supplemental ($000)

Budget	Expenditures and Forecast	Forecasted Variance
2,059.8	2,779.8	720.0

This three-year supplemental project (2023–2025) has carried over into 2026. The project scope is to expand the capacity of the province's Electric Vehicle ("EV") fast charging network in partnership with the Government of Newfoundland and Labrador and the Government of Canada.

The forecasted variance in overall project expenditures is attributed to an increase in the planned number of charging stations to be installed. The original project scope included the procurement and installation of seven ultra-fast direct current EV chargers at five of Hydro's most utilized charging sites along the Trans-Canada Highway. In 2024, additional funding was secured from the Government of Newfoundland and Labrador, and the number of planned new chargers has increased to ten. The project has been carried over to 2026 to allow for completion of the additional chargers. Furthermore, the start of construction was delayed for some chargers due to challenges securing property lease agreements at the host sites, resulting in the carryover of some commissioning activities.

1.2.4 Replace Powerhouse 1 Roof (2024–2025) – Bay d'Espoir

Table 17: Project Variance – Replace Powerhouse 1 Roof (2024–2025) – Bay d'Espoir ($000)

Budget	Expenditures and Forecast	Forecasted Variance
1,959.4	2,328.4	369.0

This two-year project (2024–2025) has carried over into 2026. The project scope includes the replacement of the Bay d'Espoir Powerhouse 1 roof membrane system and the replacement of the rooftop fall protection system. The start of construction in 2025 was delayed due to the requirement to investigate and mitigate electrical induction hazards associated with high-voltage power lines in the vicinity of the roof. This requirement resulted in additional time for engineering to develop and implement a solution to ground all metal surfaces on the roof so that work could be performed safely. After implementing the solution, installation of the new roof system commenced and was approximately 90% completed in 2025. The installation of a portion of the roofing system in areas near high voltage powerlines and the permanent roof guardrail system for fall prevention could not be completed in 2025 due to unfavourable weather and difficulty in securing the required outages for safe work execution. The remaining work is expected to be completed in 2026.

The forecasted variance in overall project expenditures is attributed to:

- Additional contractor costs for remobilization and demobilization in 2026; and
- Additional project management, engineering, and construction management costs associated with project carryover into 2026.

No viable alternatives were identified for this project, and Hydro is proceeding with execution.

1.2.5 Replace Mobile Equipment (2025–2027)

Table 18: Program Variance – Replace Mobile Equipment (2025–2027) ($000)

Budget	Expenditures and Forecast	Forecasted Variance
4,647.6	5,230.5	582.9

This program budget is updated as part of the 2027 CBA. Please refer to Section 2.5 for discussion.

1.2.6 Replace VHF Radio Systems (2024–2025)

Table 19: Project Variance – Replace VHF Radio Systems (2024–2025) ($000)

Budget	Expenditures and Forecast	Forecasted Variance
1,552.2	1,858.2	306.0

This two-year project (2024–2025) has carried over into 2026. The purpose of the project is to replace the functionality previously provided by the Very High Frequency ("VHF") radio system to allow for improved worker safety and efficiency. Hydro originally proposed installing a combination of mobile and fixed push-to-talk capable satellite phones, as well as a small number of fixed cellular phones. Mobile installations were to include vehicle-mounting kits with vehicle antennas, and fixed installations were to include desk-mounting kits, antennas, cellular boosters, and cabling.

During project planning, Hydro identified alternative solutions that would provide broader service coverage, better data capabilities, and higher reliability. As a result, Hydro cancelled the original scope of work to install satellite and cellular services and is implementing the following alternatives:

- Hydro is procuring and installing radios as part of the Government of Newfoundland and Labrador's P25 Provincial Wide Radio System ("PWRS"), a system used by provincial police, health, and fire services. The PWRS has improved coverage and performance compared to cellular service and has inter-operation capabilities with dedicated channels.
- In select fleet vehicles, Hydro is installing Starlink communications systems coupled with Cradle Point routers for a secure path to Hydro Place. These systems allow the connection of existing cellular phones and laptops in remote areas where there is no PWRS or cellular coverage.

The forecasted variance in overall project expenditure is attributed to an increase in engineering labour and material expenditures associated with the change in project scope from satellite phones to P25 radios. The additional time taken to review alternative technology solutions resulted in the project carrying over to 2026. Installation of approximately half of the communications equipment was completed in 2025, with the remainder carried over to 2026.

1.2.7 Refurbish Control Building (2024-2025) - Grandy Brook and Doyles

Table 20: Project Variance – Refurbish Control Building (2024–2025) – Grandy Brook and Doyles ($000)

Budget	Expenditures and Forecast	Forecasted Variance
554.1	913.9	359.8

This two-year project (2024–2025) has carried over into 2026. The project scope is to refurbish the interior and exterior of the Grandy Brook and Doyles Terminal Station Control Buildings. Due to increased time required for engineering and procurement activities, the start of construction was delayed. Construction was approximately 90% complete in 2025, with the remaining activities carrying over to 2026.

The forecasted variance in overall project expenditures is attributed to higher than originally estimated expenditures for the consultant's detailed engineering design and the construction contract.

No viable alternatives were identified for this project, and Hydro is proceeding with execution.

1.3 System Growth

1.3.1 Wabush Terminal Station Upgrades (2021–2024)

Table 21: Project Variance – Wabush Terminal Station Upgrades (2021–2024) ($000)

Budget	Expenditures and Forecast	Forecasted Variance
12,678.1	17,172.1	4,494.0

This four-year project (2021–2024) has carried over into 2026. The project scope is to replace Transformers T4 and T5 and install a new Capacitor Bank C3 to support Hydro's ability to provide firm supply for customers in accordance with the transmission system criteria established in Western Labrador. The project is substantially complete with the new Capacitor Bank C3 installed in 2023, Transformer T5 installed in 2024, and Transformer T4 installed in 2025. The project carried over to 2026 for the dismantling and removal of the former Transformer T4.

The forecasted variance in overall project expenditures is primarily attributed to higher than originally estimated contract supply and construction costs for Transformers T4 and T5 and the Capacitor Bank

C3. Market rates for construction services significantly exceeded the estimates prepared during the budget proposal phase, with particularly elevated costs observed for work in Labrador.

No viable alternatives were identified for this project, and Hydro is proceeding with execution.

1.3.2 Additions for Load Growth – Unit 2065 Replacement and Fuel Storage Upgrades (2024–2027) – Rigolet

Table 22: Project Variance – Additions for Load Growth – Unit 2065 Replacement and Fuel Storage Upgrades (2024–2027) – Rigolet ($000)

Budget	Expenditures and Forecast	Forecasted Variance
3,429.2	3,843.9	414.7

This project budget is updated as part of the 2027 CBA. Please refer to Section 2.2 for discussion.

1.4 Access

There are no forecasted reportable variances for projects and programs in the Access investment classification.

1.5 Service Enhancement

There are no forecasted reportable variances for projects and programs in the Service Enhancement investment classification.

1.6 Mandatory

There are no forecasted reportable variances for projects and programs in the Mandatory investment classification.

1.7 Allowance for Unforeseen

Hydro did not identify any work to the end of May 2026 that necessitated the use of the Allowance for Unforeseen Items Account.

2.0 Project and Program Budget Updates

Hydro completed a review of the scope, schedule, and cost estimates for multi-year projects and programs continuing in 2027 that were approved as part of prior CBAs or supplemental applications.

Hydro identified six previously approved projects and programs where the overall forecast expenditure is higher or lower than the approved estimate, and/or the forecasted annual expenditures in 2027 and beyond are expected to shift. The 2027 portion of the budget for each of these projects and programs is now different than originally presented in the 2026 CBA or applicable supplemental application.

A summary of the original and updated cost estimates as of May 31, 2026, for these projects and programs is provided herein.

2.1 Additions for Load Growth – Upgrade Transformer Capacity (2023–2024) – Jean Lake Terminal Station

This two-year project (2023–2024) commenced in 2023. The project scope is to complete modifications to the Wabush Substation[23] to ensure a reliable power supply to the Town of Wabush in the event of a failure of the largest transformer, T1. The project budget was updated, and the schedule was extended into 2028, as part of budget updates in the 2024, 2025, and 2026 CBAs. This project is one of two projects that Hydro has been undertaking, corresponding to two phases of capacity upgrades to meet forecasted peak loads and improve the reliability of the station.[24]

Recent project experience in Wabush indicated significantly higher construction contract and materials costs than originally estimated. As a result, Hydro paused these two projects in 2025[25] and initiated a review of the overall budget and schedule. The outcome of this review will inform the estimate for the remaining work, confirm the least-cost alternative, and update the system analysis to determine the required project timeline. At the time of filing the 2027 CBA, this review remains ongoing due to the complexity of the project and the requirement to complete a detailed constructability review. Hydro will file a project to complete the remaining scope following this review.

[23] At the conclusion of the upgrades, the Wabush Substation will be renamed the Jean Lake Terminal Station.
[24] The first phase of upgrades was the project titled Additions for Load - Wabush Substation Upgrades (2021–2025), which was closed in 2025. The remaining scope of this project will be combined with Additions for Load Growth – Upgrade Transformer Capacity (2023–2024) – Jean Lake Terminal Station in a future application to the Board.
[25] Hydro paused the initiation of any new procurement and construction activities, but there were expenditures in 2025, and there are forecast expenditures in 2026 related to the receipt and temporary placement of the new transformer that had been ordered before the pause. There were also project management expenditures associated with the budget and schedule review. Hydro has confirmed that pausing the project is not expected to significantly impact its ability to reliably serve load while the project is being executed under a new timeline.

Hydro has taken delivery of both transformers planned for installation under these projects. As reported in the 2025 Capital Expenditures and Carryover Report,[26] T1 has been installed in a temporary location and is in service. T2 will be placed in a temporary location but will not be interconnected. In the event of a loss of T1 or multiple transformer failures, T2 can be interconnected, mitigating the risk to customers in Wabush.

This project will close in 2026; therefore, the budget estimates in 2027 and 2028 are brought to zero, as shown in Table 23, as the budget for the remaining scope of work will be included in a future proposal.

Table 23: Budget Update – Additions for Load Growth – Upgrade Transformer Capacity (2023–2024) – Jean Lake Terminal Station ($000)[27]

	Approved				Estimated		
Project Cost	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**Total**
Budget Estimate in 2023 CBA	580.0	5,436.1	-	-	-	-	**6,016.1**
Revised Budget Estimate in 2024 CBA	580.0	-	5,436.1	-	-	-	**6,016.1**
Revised Budget Estimate in 2025 CBA	580.0	-	6,459.6	789.7	-	-	**7,829.3**
Revised Budget Estimate in 2026 CBA	580.0	-	6,459.6	-	1,335.1	2,625.0	**10,999.7**
Revised Budget Estimate in 2027 CBA	580.0	-	6,459.6	-	-	-	**7,039.6**
Actual Expenditure and Forecast	52.0	596.7	1,807.9	919.7	-	-	**3,376.3**

2.2 Additions for Load Growth – Unit 2065 Replacement and Fuel Storage Upgrades (2024–2027) – Rigolet

This four-year project (2024–2027) commenced in 2024. The project scope is to replace Unit 2065 at the Rigolet Diesel Generating Station with a 545 kW-rated diesel genset and replace the three existing horizontal fuel storage tanks with larger tanks to increase fuel storage capabilities.

As reflected in a budget update in the 2026 CBA, Hydro advanced the schedule for this project to address the timing of growing electricity needs in the community of Rigolet, specifically to provide electrical service for a new Department of Health and Social Development building. The majority of the genset procurement and installation activity originally planned for completion in 2027 is now expected

[26] "Capital Expenditures and Carryover Report for the Year Ended December 31, 2025," Newfoundland and Labrador Hydro, April 1, 2026.
[27] Numbers may not add due to rounding.

to be completed in 2026. Additionally, the fuel storage tank procurement and installation were advanced from 2026 and completed in 2025.

The final sizing and selection of fuel storage tanks resulted in a requirement for five tanks to replace the existing three tanks, with expenditures exceeding the original budget estimate. Tank installation activity was originally planned to be executed by internal resources in 2026; with the work advancing into 2025, internal resources were not available, and a contractor was utilized, resulting in higher costs than were originally estimated. There were no viable alternatives with respect to the fuel storage tanks, and Hydro proceeded with execution. The revised budget estimate is presented in Table 24 and reflects the forecasted cost increase.

Table 24: Budget Update – Additions for Load Growth – Unit 2065 Replacement and Fuel Storage Upgrades (2024–2027) – Rigolet ($000) [28]

	Approved			Estimated	
Project Cost	**2024**	**2025**	**2026**	**2027**	**Total**
Budget Estimate (2024)[29]	50.1	226.4	1,604.8	1,548.0	**3,429.2**
Revised Budget Estimate in 2026 CBA	50.1	226.4	3,082.9	69.9	**3,429.2**
Revised Budget Estimate in 2027 CBA[30]	50.1	226.4	3,082.9	484.5	**3,843.9**
Actual Expenditure and Forecast	21.9	1,831.3	1,920.8	69.9	**3,843.9**

2.3 Replace Emergency Diesel Genset (2025–2027) – Cat Arm

This three-year project (2025–2027) commenced in 2025. The project scope is to replace the emergency diesel genset at the Cat Arm Hydroelectric Generating Station.

The supply of a new diesel genset was tendered and awarded in 2025 at a cost that is less than the original budget estimate. The revised budget estimate is presented in Table 25 and reflects the forecasted cost decrease.

[28] Numbers may not add due to rounding.
[29] Approved in Board Order No. P.U. 25(2024).
[30] The revised budget estimate for 2027 is the actual expenditure and forecast for 2024–2027 less the budget previously approved for 2024–2026.

Table 25: Budget Update – Replace Emergency Diesel Genset (2025–2027) – Cat Arm ($000)

	Approved		Estimated	
Project Cost	**2025**	**2026**	**2027**	**Total**
Budget Estimate in 2025 CBA	266.2	1,221.1	113.9	**1,601.2**
Revised Budget Estimate in 2027 CBA	266.2	1,221.1	-	**1,487.3**
Actual Expenditure and Forecast	103.6	1,247.0	30.0	**1,380.6**

2.4 Install Breaker Failure Protection (2025–2027) – Holyrood

This three-year project (2025–2027) commenced in 2025. The project scope is to upgrade the 230 kV breaker failure protection for 13 circuit breakers at the Holyrood Terminal Station.

As of May 31, 2026, the engineering and procurement for 7 of the 13 breaker failure protection systems are complete, and no construction has commenced. An updated estimate for the construction activity is higher than the original estimate, primarily due to a need to utilize contractors to supplement internal construction resources. As the expected total project cost is now significantly above $750,000, Hydro decided to pause this work and submit a new budget proposal as part of the 2027 CBA for the remaining engineering, procurement, and construction work.[31] The project expenditures associated with engineering and procurement on this project prior to the pause will be treated financially as work-in-progress until such time that the work is approved, constructed, and placed in service on the subsequent project. The updated project forecast for 2026 includes an estimate for deficiency work for breaker failure upgrades at Sunnyside and Oxen Pond Terminal Stations that were substantially completed in a project that closed in 2025. The revised budget estimate is presented in Table 26 and reflects the forecasted cost decrease associated with de-scoping the project.

Table 26: Budget Update – Install Breaker Failure Protection (2025–2027) – Holyrood ($000)

	Approved		Estimated	
Project Cost	**2025**	**2026**	**2027**	**Total**
Budget Estimate in 2025 CBA	177.8	320.9	166.5	**665.2**
Revised Budget Estimate in 2027 CBA	177.8	320.9	-	**498.7**
Actual Expenditure and Forecast	185.2	186.5	-	**371.7**

[31] Please refer to Install Breaker Failure Protection (2027–2028) Schedule 7.

2.5 Replace Mobile Equipment (2025–2027)

This three-year program (2025–2027) commenced in 2025. The program scope is to replace light- and heavy-duty mobile equipment and includes accessorizing, as required, based on the purposes of the equipment. The scope for this 2025–2027 program includes:

- The planned replacement of 3 heavy-duty assets (2 tracked aerial device units and 1 wheel loader backhoe);
- The planned replacement of 38 non-heavy-duty assets (14 snowmobiles, 12 ATVs, 11 trailers, and 1 forklift); and
- An allowance to address in-service failures for mobile equipment in 2025.

The procurement costs for the two tracked aerial device units and expenditures for equipment refurbishment or replacement to address in-service failures in 2025 were higher than originally estimated.

No viable alternatives were identified for this project, and Hydro is proceeding with execution.

The revised budget estimate is presented in Table 27 and reflects the forecasted cost increase.

Table 27: Budget Update – Replace Mobile Equipment (2025–2027) ($000)

	Approved		Estimated	
Program Cost	**2025**	**2026**	**2027**	**Total**
Budget Estimate in 2025 CBA	1,973.6	54.6	2,619.4	**4,647.6**
Revised Budget Estimate in 2027 CBA[32]	1,973.6	54.6	3,202.3	**5,230.5**
Actual Expenditure and Forecast	344.4	2,266.7	2,619.4	**5,230.5**

2.6 Replace Light- and Heavy-Duty Vehicles (2025–2027)

This three-year program (2025–2027) commenced in 2025. The program scope is to replace light- and heavy-duty vehicles in accordance with Hydro's replacement criteria and includes accessorizing, as

[32] The revised budget estimate for 2027 is the actual expenditure and forecast for 2025-2027 less the budget previously approved for 2025-2026.

required, based on the purpose of the vehicle. The original budget estimate for this 2025–2027 program was based on:

- The planned replacement of 35 light-duty vehicles;
- The planned replacement of 8 heavy-duty vehicles; and
- An allowance in 2025 to address in-service failures for fleet vehicles.

The number of replacements of light-duty vehicles in 2026 was higher than budget, primarily due to vehicles ordered in 2025 not being delivered until 2026 as a result of order timing.

No viable alternatives were identified for this project, and Hydro is proceeding with execution.

The revised budget estimate is presented in Table 28 and reflects the forecasted cost increase.

Table 28: Budget Update – Replace Light- and Heavy-Duty Vehicles (2025–2027) ($000)

	Approved		Estimated	
Program Cost	**2025**	**2026**	**2027**	**Total**
Budget Estimate in 2025 CBA	2,714.6	1,675.8	3,147.2	**7,537.6**
Revised Budget Estimate in 2027 CBA[33]	2,714.6	1,675.8	3,447.2	**7,837.6**
Actual Expenditure and Forecast	412.8	4,277.6	3,147.2	**7,837.6**

3.0 Cloud-Based Expenditures

In Order No. P.U. 35(2025), the Board approved the creation of a Cloud Cost Deferral Account effective January 1, 2025 (“Deferral Account”). The operating costs incurred in the implementation of cloud-based software solutions will be charged to the Deferral Account; specifically, the costs that would have been capitalized if the solution had been on-premises. The amount charged to this account will include up-front payments for implementation costs and other directly attributable costs for cloud-based solutions, and capitalized interest as calculated in accordance with Hydro’s Capitalization Guidelines.

[33] The revised budget estimate for 2027 is the actual expenditure and forecast for 2025–2027 less the budget previously approved for 2025–2026.

Hydro proposes Information Systems projects through the regulatory CBA process, as Hydro does not typically know whether a solution for a proposed project will be a cloud-based or on-premises solution until the completion of the procurement process, at the earliest.[34]

Each of the projects listed herein incorporates a cloud-based software solution provided to Hydro as a subscription-based SaaS[35] model, whereby Hydro is provided access to the software in exchange for monthly user access or license payments throughout the contract term. The costs identified for each of the projects are the one-time operating costs associated with the implementation of these programs for Hydro's use. There are no monthly or annual license or subscription fees included in these implementation costs. The portion of these implementation costs that apply to serving Hydro's non-regulated lines of business will be recovered in accordance with Hydro's Intercompany Transactions Costing Guidelines as the Deferral Account is amortized.

In its Report on Amalgamation Activities,[36] Hydro noted that it would provide the Board with information on cloud-based expenditures within its Capital Expenditures and Carryover Report; details on the projects in this category are included herein.

3.1 Project Controls Management System – Major Projects (2025)[37]

Table 29: Project Cost Update – Project Controls Management System – Major Projects (2025)

Budget	Expenditures and Forecast	Forecasted Variance
252.4	252.4	0.0

This one-year project (2025) has carried over into 2026. While the overall project estimate did not change, the actual spend timing during execution has differed. Hydro has spent $0.1 million as of the end of 2025.

[34] If a situation arises wherein a project is known to be a cloud-based solution in the planning stage in advance of procurement and is therefore not a capital project, Hydro will continue to follow the same or a similar process and seek Board approval prior to the deferral of any cloud-based implementation costs.
[35] Software as a Service ("SaaS").
[36] "Report on Amalgamation Activities," Newfoundland and Labrador Hydro, rev. April 17, 2025 (originally filed April 15, 2025).
[37] As reported in "Quarterly Regulatory Report – Quarter Ended March 31, 2025", Newfoundland and Labrador Hydro, May 29, 2026.

The Project Controls Management System project was determined to be a cloud-based solution that doesn't qualify for capitalization under IFRS. Implementation operating costs incurred as part of this project will be included in the Cloud Cost Deferral, as approved in Board Order P.U. 1(2026).

4.0 Bay d'Espoir Penstock Execution Update

Penstock 1 was successfully released for service on December 17, 2025, upon completion of all required checks to return the penstock to normal operation. As reported in the January 2026 Major Projects Report,[38] minor deficiencies and punch list items, including final site cleanup, final grading of laydown and access roads, application of hydroseed, and minor coating touch-ups, have been identified. These activities are planned to be completed as soon as conditions allow, as part of project closeout.

As directed in Board Order No. P.U. 26(2024), Hydro provided monthly updates on the status of the Penstock 1 project until January 2026. As committed in the January 2026 report, final project costs will be confirmed and reported through Hydro's annual Capital Expenditures and Carryover Report, in accordance with established capital reporting processes and Board requirements.

Table 30: Project Cost Update – Penstock 1 Refurbishment –Bay d'Espoir ($000)

Budget	Expenditures and Forecast
65,876.0	62,891.1

Overall project closeout, including final documentation and reporting, is forecasted to be completed in the third quarter of 2026, after completion of the remaining punch list and deficiency items. The Contractor returned to site in May 2026, during the planned Penstock 1 outage, to address the punch list items and minor deficiencies that were identified during commissioning and return to service activities in December 2025. Items including site clean-up, final grading of laydown and access roads, and minor coating repairs were completed. Due to weather and site conditions, the final application of hydroseed was not completed during this time but is planned for completion in the third quarter of 2026.

[38] "Bay d'Espoir Hydroelectric Penstock 1 Life Extension Project Update," Newfoundland and Labrador Hydro, January 15, 2026.

Further, during the outage inspection of the interior coating, additional coating deficiencies were identified. The Contractor is currently investigating the root cause of the deficiencies to determine the scope of work required for repair. There are no anticipated costs to Hydro related to the rectification of these deficiencies. The penstock has been returned to service, but it is expected further remediation work will be required to address the deficiencies at a later date. At this time, the schedule for the repair work is unknown.

As part of the *Bay d'Espoir Penstock 1 Section Replacement and Weld Refurbishment* proceeding, it was acknowledged that similar life extension work would be required for Penstocks 2 and 3. Hydro has continued to conduct annual inspections of Penstocks 2 and 3 to assess their condition and determine the appropriate timing for capital investment while avoiding similar ruptures experienced on Penstock 1.

On March 13, 2026, Hydro submitted its application to the Board for the Life Extension of Penstock 3.[39] Based on the execution of the replacement and refurbishment project for Penstock 1, Hydro estimates that an eight-month outage will be required during the construction phase of the Penstock 3 scope. It is not feasible for Hydro to refurbish more than one penstock, such as Penstock 2 and 3, in a single construction season without risking customer outages. Furthermore, executing refurbishment and repair works on two penstocks concurrently poses potential resource concerns, site bottlenecking, and safety concerns due to close interfaces. Additionally, delays in any concurrent work could pose a risk of having two penstocks out during the winter readiness period (beyond December 1). While Penstock 2 and 3 both exhibit signs of wear, corrosion, and potential stress-related issues, Penstock 3 presents a more immediate risk to reliability. This is due to the extent, urgency, and frequency of weld indications as well as their reoccurrence in previously repaired locations. This assessment is supported by Kleinschmidt Associates' ongoing annual inspections and the resulting recommendations. To meet peak customer demand and winter readiness requirements, Hydro proposes proceeding with the Penstock 3 project; however, refurbishment of Penstock 2 is planned to follow as soon as practicable, in line with consultants' recommendations from routine inspections and assessments. Hydro's current assumption is that the Penstock 2 Life Extension work will be from 2029–2031.

[39] Hydro's application was approved in Board Order No. P.U. 22(2026).

Further information on Bay d'Espoir and capital planning for the assets within the facility is included within Schedule 4 of this application.

Appendix A

Capital Programs and Projects Variance Summary





2026 Capital Expenditures Summary By Year
($000)[1]

	Capital Budget										Actual Expenditure and Forecast									Variance			
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Year	2021	2022	2023	2024	2025	Carryover to 2026	Original 2026	Revised 2026	2027 and Beyond	Total	2021	2022	2023	2024	2025	Original 2026	2026 Forecast Remaining Jun–Dec	Beyond	Total	Project		Annual	
2026	-	-	-	-	-	0.00	95,536.01	95,536.01	55,283.51	**150,819.53**	-	(0.00)	-	-	-	15,450.13	82,884.31	55,283.51	**153,617.96**	2,798.43	1.86%	2,798.43	2.93%
2025	-	-	-	-	47,144.41	23,308.84	37,368.71	60,677.55	12,695.21	**97,208.33**	-	-	-	-	35,570.99	15,878.50	45,273.73	12,444.81	**109,168.03**	11,959.70	12.30%	474.68	0.78%
2024	-	-	-	4,954.65	10,757.35	1,118.95	6,918.70	8,037.64	556.18	**23,186.88**	-	-	-	3,411.26	14,713.34	1,934.65	7,546.22	556.19	**28,161.67**	4,974.78	21.46%	1,443.23	17.96%
2023	-	-	4,041.50	12,023.09	67,950.83	9,761.75	-	9,761.75	13,123.00	**97,138.42**	-	-	2,256.80	9,547.56	63,974.28	1,518.95	4,579.53	9,163.40	**91,040.53**	(6,097.89)	-6.28%	(3,663.27)	-37.53%
2022	-	-	-	-	-	-	-	-	-	**-**	-	-	-	-	-	-	-	-	**-**	-		-	
2021	5,846.25	10,184.60	5,221.30	6,589.60	4,952.20	2,338.43	-	2,338.43	-	**32,793.95**	3,039.50	6,360.78	13,012.24	11,328.30	7,616.82	1,250.10	1,685.78	-	**44,293.52**	11,499.57	35.07%	597.45	25.55%
Total	**5,846.25**	**10,184.60**	**9,262.80**	**23,567.34**	**130,804.79**	**36,527.97**	**139,823.42**	**176,351.40**	**81,657.91**	**401,147.11**	**3,039.50**	**6,360.78**	**15,269.04**	**24,287.13**	**121,875.43**	**36,032.34**	**141,969.57**	**77,447.91**	**426,281.70**	**25,134.59**		**1,650.52**	

[1] Numbers may not add due to rounding.

2026 Capital Expenditures Summary by Category
($000)[1]

	Capital Budget										Actual Expenditure and Forecast										Variance			
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)		K-F		H-D	
Category	2021	2022	2023	2024	2025	Carryover to 2026	Original 2026	Revised 2026	2027 and Beyond	Total	2021	2022	2023	2024	2025	Original 2026	2026 Forecast Remaining Jun–Dec	Beyond	Total		Project		Annual	
Hydraulic Plant	3,236.82	3,238.30	5,575.10	8,964.19	76,454.23	9,138.75	22,554.10	31,692.85	7,110.10	**127,132.84**	2,196.44	4,301.54	5,055.95	12,442.37	70,164.67	4,820.36	27,754.61	7,026.20	**133,762.14**	6,629.30	5.21%	882.11	2.78%
Thermal Plant	-	-	-	139.77	17,856.83	4,668.71	25,408.36	30,077.08	1,088.10	**44,493.07**	-	-	-	141.27	20,525.55	6,357.50	23,719.58	1,088.10	**51,832.00**	7,338.93	16.49%	-	0.00%
Gas Turbines	-	-	-	60.90	848.61	630.81	1,972.56	2,603.37	638.70	**3,520.77**	-	-	-	95.78	678.90	546.80	2,056.57	638.70	**4,016.75**	495.99	14.09%	-	0.00%
Terminal Stations	2,301.72	4,935.50	2,334.10	5,502.90	11,415.40	9,236.06	17,138.93	26,374.99	23,674.50	**67,303.04**	794.01	1,843.19	8,105.71	5,582.12	7,468.39	3,997.70	18,904.04	19,548.40	**66,243.55**	(1,059.49)	-1.57%	(3,473.26)	-13.17%
Transmission	-	-	-	-	883.50	668.86	7,975.60	8,644.46	12,012.90	**20,872.00**	-	-	-	-	214.64	1,605.00	7,039.46	12,012.90	**20,872.00**	-	0.00%	-	0.00%
Distribution	-	-	-	332.91	3,598.06	2,931.77	21,170.73	24,102.50	11,544.99	**36,646.69**	-	(0.00)	-	83.69	1,057.90	5,532.14	19,161.67	11,544.99	**37,380.39**	733.70	2.00%	591.32	2.45%
Generation	307.71	2,010.80	937.40	759.87	2,537.66	(3,108.72)	11,890.46	8,781.74	4,156.30	**22,600.20**	49.04	216.05	1,779.95	2,027.17	7,284.90	3,540.59	9,553.19	4,156.31	**28,607.21**	6,007.01	26.58%	4,312.04	49.10%
Properties	-	-	353.70	2,886.30	1,130.39	2,250.34	4,804.50	7,054.84	1,791.00	**10,965.89**	-	-	316.19	410.13	3,953.73	2,061.26	4,993.59	1,791.00	**13,525.89**	2,560.00	23.35%	-	0.00%
Metering	-	-	-	302.60	660.60	(14.13)	2,462.50	2,448.37	980.10	**4,405.80**	-	-	-	171.46	805.87	354.07	2,039.90	980.10	**4,351.40**	(54.40)	-1.23%	(54.40)	-2.22%
Tools and Equipment	-	-	-	24.00	2,815.40	2,326.54	3,297.76	5,624.30	6,541.30	**12,678.46**	-	-	-	22.45	997.08	1,835.40	3,788.90	6,541.30	**13,185.13**	506.67	4.00%	0.00	0.00%
Information Systems	-	-	-	-	3,000.11	2,034.11	7,163.21	9,197.32	1,983.91	**12,147.24**	-	-	-	-	848.55	1,617.86	6,972.16	1,983.91	**11,422.48**	(724.76)	-5.97%	(607.30)	-6.60%
Telecontrol	-	-	-	1,348.80	2,509.30	1,053.62	5,415.80	6,469.42	3,447.30	**12,721.20**	-	-	-	216.74	2,790.11	1,164.69	5,304.73	3,447.30	**12,923.57**	202.37	1.59%	-	0.00%
Transportation	-	-	62.50	3,245.10	7,094.70	4,711.26	6,880.80	11,592.06	6,688.70	**23,971.80**	-	-	11.24	3,093.94	5,085.16	2,420.25	9,171.80	6,688.70	**26,471.09**	2,499.29	10.43%	(0.00)	0.00%
Administration	-	-	-	-	-	-	688.10	688.10	-	**688.10**	-	-	-	-	-	178.72	509.38	-	**688.10**	-	0.00%	-	0.00%
Allowance for Unforeseen Items	-	-	-	-	-	-	1,000.00	1,000.00	-	**1,000.00**	-	-	-	-	-	-	1,000.00	-	**1,000.00**	-	0.00%	-	0.00%
Total	**5,846.25**	**10,184.60**	**9,262.80**	**23,567.34**	**130,804.79**	**36,527.97**	**139,823.42**	**176,351.40**	**81,657.91**	**401,147.11**	**3,039.50**	**6,360.78**	**15,269.04**	**24,287.13**	**121,875.43**	**36,032.34**	**141,969.57**	**77,447.91**	**426,281.70**	**25,134.59**		**1,650.52**	

[1] Numbers may not add due to rounding.

2026 Capital Expenditures By Investment Classification
($000)[1]

	Capital Budget										Actual Expenditure and Forecast									Variance			
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Investment Class	**2021**	**2022**	**2023**	**2024**	**2025**	**Carryover to 2026**	**Original 2026**	**Revised 2026**	**2027 and Beyond**	**Total**	**2021**	**2022**	**2023**	**2024**	**2025**	**Original 2026**	**2026 Forecast Remaining Jun–Dec**	**Beyond**	**Total**	**Project**		**Annual**	
Access	-	-	-	-	344.20	128.59	7,046.80	7,175.39	1,249.40	**8,640.40**	-	(0.00)	-	-	215.61	1,977.98	5,197.41	1,249.40	**8,640.40**	(0.00)	0.00%	(0.00)	0.00%
General Plant	-	-	416.20	8,026.36	18,990.21	13,282.70	27,982.58	41,265.28	18,913.41	**74,328.76**	-	-	327.42	4,037.65	16,164.61	9,332.88	31,325.10	18,913.41	**80,101.08**	5,772.31	7.77%	(607.30)	-1.47%
Mandatory	-	-	-	-	446.20	(137.70)	2,172.80	2,035.10	980.10	**3,599.10**	-	-	-	-	583.90	262.83	1,772.27	980.10	**3,599.10**	0.00	0.00%	-	0.00%
Renewal	3,544.53	5,249.10	6,594.10	10,000.79	98,581.24	13,928.05	88,685.41	102,613.47	33,987.81	**246,642.99**	2,245.48	4,517.59	6,879.75	14,704.89	97,764.80	21,893.43	86,695.53	33,737.41	**268,438.87**	21,795.88	8.84%	5,975.49	5.82%
Service Enhancement	-	-	39.60	1,662.40	5,756.10	5,643.96	7,292.90	12,936.86	21,319.30	**36,070.30**	-	-	17.53	318.29	1,813.31	1,827.94	11,054.52	21,319.80	**36,351.39**	281.09	0.78%	(54.40)	-0.42%
System Growth	2,301.72	4,935.50	2,212.90	3,877.79	6,686.84	3,682.37	5,642.93	9,325.30	5,207.88	**30,865.56**	794.01	1,843.19	8,044.34	5,226.30	5,333.21	737.28	4,924.75	1,247.79	**28,150.87**	(2,714.69)	-8.80%	(3,663.27)	-39.28%
Allowance for Unforeseen	-	-	-	-	-	-	1,000.00	1,000.00	-	**1,000.00**	-	-	-	-	-	-	1,000.00	-	**1,000.00**	-	0.00%	-	0.00%
Total	**5,846.25**	**10,184.60**	**9,262.80**	**23,567.34**	**130,804.79**	**36,527.97**	**139,823.42**	**176,351.40**	**81,657.91**	**401,147.11**	**3,039.50**	**6,360.78**	**15,269.04**	**24,287.13**	**121,875.43**	**36,032.34**	**141,969.57**	**77,447.91**	**426,281.70**	**25,134.59**		**1,650.52**	

[1] Numbers may not add due to rounding.

2026 Capital Expenditures By Investment Classification
Renewal
($000)[1]

	Capital Budget										Actual Expenditure and Forecast									Variance			
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Project	2021	2022	2023	2024	2025	Carryover to 2026	Original 2026	Revised 2026	2027 and Beyond	Total	2021	2022	2023	2024	2025	Original 2026	2026 Forecast Remaining Jun–Dec	Beyond	Total	Project		Annual	
Perform Level 2 Condition Assessment - Penstock (2026) - Hinds Lake	-	-	-	-	-	-	209.60	209.60	-	**209.60**	-	-	-	-	-	19.52	190.08	-	**209.60**	-	0.00%	-	0.00%
Overhaul Hydraulic Units (2026)	-	-	-	-	-	-	2,023.60	2,023.60	-	**2,023.60**	-	-	-	-	-	160.78	1,862.82	-	**2,023.60**	-	0.00%	-	0.00%
Perform Level 2 Condition Assessment - North Salmon Spillway (2026) - Upper Salmon	-	-	-	-	-	-	636.50	636.50	-	**636.50**	-	-	-	-	-	38.55	597.95	-	**636.50**	-	0.00%	-	0.00%
Gas Turbine In-Service Failures (2026)	-	-	-	-	-	-	500.10	500.10	-	**500.10**	-	-	-	-	-	73.24	426.86	-	**500.10**	-	0.00%	-	0.00%
Replace Air Dryer (2026–2027) - Hardwoods	-	-	-	-	-	-	75.20	75.20	198.00	**273.20**	-	-	-	-	-	17.88	57.32	198.00	**273.20**	-	0.00%	-	0.00%
Perform Level 2 Condition Assessment - Penstock 4 (2026) - Bay d'Espoir	-	-	-	-	-	-	237.20	237.20	-	**237.20**	-	-	-	-	-	16.60	220.60	-	**237.20**	-	0.00%	-	0.00%
Perform Dam Infrastructure Refurbishments (2026)	-	-	-	-	-	-	500.00	500.00	-	**500.00**	-	-	-	-	-	8.18	491.82	-	**500.00**	-	0.00%	-	0.00%
Thermal In-Service Failures (2026)	-	-	-	-	-	-	3,823.70	3,823.70	-	**3,823.70**	-	-	-	-	-	601.38	3,222.32	-	**3,823.70**	-	0.00%	-	0.00%
Overhaul Turbine Valves and Generator - Unit 2 (2026) - Holyrood	-	-	-	-	-	0.00	6,969.56	6,969.56	-	**6,969.56**	-	-	-	-	-	766.94	6,202.63	-	**6,969.56**	0.00	0.00%	-	0.00%
Replace Parts of Stage 1: 129 Vdc Batteries and Battery Chargers (2026–2027) - Holyrood	-	-	-	-	-	-	229.10	229.10	100.10	**329.20**	-	-	-	-	-	21.23	207.87	100.10	**329.20**	-	0.00%	-	0.00%
Perform Level 2 Condition Assessment - Condenser and Condenser Tubes (2026–2027) - Holyrood	-	-	-	-	-	-	577.30	577.30	51.70	**629.00**	-	-	-	-	-	38.00	539.30	51.70	**629.00**	-	0.00%	-	0.00%
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2026) - Holyrood	-	-	-	-	-	-	9,600.00	9,600.00	-	**9,600.00**	-	-	-	-	-	1,108.71	8,491.29	-	**9,600.00**	-	0.00%	-	0.00%
Overhaul Major Pumps (2026) - Holyrood	-	-	-	-	-	-	2,388.60	2,388.60	-	**2,388.60**	-	-	-	-	-	94.31	2,294.29	-	**2,388.60**	-	0.00%	-	0.00%
Refurbish Water Treatment Systems (2026–2027) - Holyrood	-	-	-	-	-	-	524.50	524.50	936.30	**1,460.80**	-	-	-	-	-	49.94	474.56	936.30	**1,460.80**	-	0.00%	-	0.00%
Replace Protective Relays (2026–2027)	-	-	-	-	-	-	616.00	616.00	1,969.80	**2,585.80**	-	-	-	-	-	23.55	592.45	1,969.80	**2,585.80**	-	0.00%	-	0.00%
Renew Circuit Breakers (2026–2028)	-	-	-	-	-	-	188.20	188.20	4,225.70	**4,413.90**	-	-	-	-	-	38.43	149.77	4,225.70	**4,413.90**	-	0.00%	-	0.00%
Replace Disconnects (2026–2028)	-	-	-	-	-	-	169.10	169.10	2,325.60	**2,494.70**	-	-	-	-	-	23.89	145.21	2,325.60	**2,494.70**	-	0.00%	-	0.00%
Terminal Station In-Service Failures (2026)	-	-	-	-	-	-	3,291.80	3,291.80	-	**3,291.80**	-	-	-	-	-	16.10	3,275.70	-	**3,291.80**	-	0.00%	-	0.00%
Replace Terminal Station Battery Banks and Chargers (2026–2027)	-	-	-	-	-	-	326.10	326.10	236.70	**562.80**	-	-	-	-	-	6.33	319.77	236.70	**562.80**	-	0.00%	-	0.00%
Replace Instrument Transformers (2026–2027)	-	-	-	-	-	-	371.20	371.20	196.10	**567.30**	-	-	-	-	-	33.11	338.09	196.10	**567.30**	-	0.00%	-	0.00%
Upgrade Power Transformers (2026–2027)	-	-	-	-	-	-	1,705.00	1,705.00	401.80	**2,106.80**	-	-	-	-	-	834.80	870.20	401.80	**2,106.80**	-	0.00%	-	0.00%
Replace Roof (2026–2027) - Hopedale	-	-	-	-	-	-	190.60	190.60	1,791.00	**1,981.60**	-	-	-	-	-	26.32	164.28	1,791.00	**1,981.60**	-	0.00%	-	0.00%
Diesel In-Service Failures (2026)	-	-	-	-	-	-	817.00	817.00	-	**817.00**	-	-	-	-	-	2,078.43	895.23	-	**2,973.66**	2,156.66	263.97%	2,156.66	263.97%
Overhaul Diesel Units (2026)	-	-	-	-	-	-	2,353.70	2,353.70	-	**2,353.70**	-	-	-	-	-	259.16	2,752.30	-	**3,011.46**	657.76	27.95%	657.76	27.95%
Inspect Fuel Storage Tanks (2026) - Rigolet	-	-	-	-	-	-	504.80	504.80	-	**504.80**	-	-	-	-	-	25.93	478.87	-	**504.80**	-	0.00%	-	0.00%
Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights (2026)	-	-	-	-	-	-	6,114.90	6,114.90	-	**6,114.90**	-	(0.00)	-	-	-	1,943.64	4,762.58	-	**6,706.22**	591.32	9.67%	591.32	9.67%
Supply & Install Runner- Unit 2 Cat Arm	-	-	-	-	-	-	582.20	582.20	4,254.70	**4,836.90**	-	-	-	-	-	14.63	567.57	4,254.70	**4,836.90**	-	0.00%	-	0.00%
Replace Fuel Storage Tanks (2026) - Happy Valley	-	-	-	-	-	-	696.40	696.40	-	**696.40**	-	-	-	-	-	66.92	629.48	-	**696.40**	-	0.00%	-	0.00%
Replace 125 Vdc Battery Bank (2026–2027) - Hardwoods	-	-	-	-	-	-	108.90	108.90	37.80	**146.70**	-	-	-	-	-	6.14	102.76	37.80	**146.70**	-	0.00%	-	0.00%
Replace dc Fuel Pump (2026–2027) - Hardwoods	-	-	-	-	-	-	90.40	90.40	58.40	**148.80**	-	-	-	-	-	13.74	76.66	58.40	**148.80**	-	0.00%	-	0.00%
Hydraulic In-Service Failures (2026)	-	-	-	-	-	-	2,660.30	2,660.30	-	**2,660.30**	-	-	-	-	-	73.44	2,586.86	-	**2,660.30**	-	0.00%	-	0.00%
Upgrade Spherical Valve Controls (2026–2029) - Bay d'Espoir	-	-	-	-	-	-	314.90	314.90	1,038.20	**1,353.10**	-	-	-	-	-	26.37	288.53	1,038.20	**1,353.10**	-	0.00%	-	0.00%
Replace Battery Bank (2026–2027) - Granite Canal	-	-	-	-	-	-	138.80	138.80	44.20	**183.00**	-	-	-	-	-	14.25	124.55	44.20	**183.00**	-	0.00%	-	0.00%
Replace Fuel Storage Tank (2026) - McCallum	-	-	-	-	-	-	1,008.40	1,008.40	-	**1,008.40**	-	-	-	-	-	51.60	956.80	-	**1,008.40**	-	0.00%	-	0.00%
L23/24 Steel Tower Transmission Line Renewal (2026–2029)	-	-	-	-	-	-	576.20	576.20	8,001.20	**8,577.40**	-	-	-	-	-	25.01	551.19	8,001.20	**8,577.40**	-	0.00%	-	0.00%
Perform Major Inspection - Synchronous Condenser 1 (2026–2027) - Wabush Terminal Station	-	-	-	-	-	-	43.00	43.00	700.70	**743.70**	-	-	-	-	-	9.33	33.67	700.70	**743.70**	-	0.00%	-	0.00%
Renew Distribution Feeders (2026–2027)	-	-	-	-	-	-	1,015.30	1,015.30	3,053.00	**4,068.30**	-	-	-	-	-	29.75	985.55	3,053.00	**4,068.30**	-	0.00%	-	0.00%
Transmission In-Service Failures (2026)	-	-	-	-	-	-	183.40	183.40	-	**183.40**	-	-	-	-	-	34.31	149.09	-	**183.40**	-	0.00%	-	0.00%
Wood Pole Line Management (2026)	-	-	-	-	-	-	6,313.70	6,313.70	-	**6,313.70**	-	-	-	-	-	1,340.26	4,973.44	-	**6,313.70**	-	0.00%	-	0.00%
Replace Emergency Diesel Genset (2025–2027) - Cat Arm	-	-	-	-	266.20	162.60	1,221.10	1,383.70	113.90	**1,601.20**	-	-	-	-	103.60	52.49	1,194.46	30.00	**1,380.55**	(220.65)	-13.78%	(136.75)	-9.88%
Overhaul Hydraulic Units (2025) - Bay d'Espoir	-	-	-	-	4,972.40	1,322.59	-	1,322.59	-	**4,972.40**	-	-	-	-	3,602.66	339.66	982.93	-	**4,925.25**	(47.15)	-0.95%	-	0.00%
Overhaul Turbine and Valves - Unit 3 (2025) - Holyrood	-	-	-	-	15,975.90	3,566.26	-	3,566.26	-	**15,975.90**	-	-	-	-	19,795.75	3,442.11	124.15	-	**23,362.01**	7,386.11	46.23%	-	0.00%
Rewind Stator (2025–2026) - Hinds Lake	-	-	-	-	5,233.20	3,090.02	9,695.50	12,785.52	-	**14,928.70**	-	-	-	-	3,309.85	1,609.83	11,175.69	-	**16,095.37**	1,166.67	7.81%	-	0.00%
Update Flame Scanners - Unit 3 (2025) - Holyrood	-	-	-	-	140.60	128.56	-	128.56	-	**140.60**	-	-	-	-	147.02	37.44	91.12	-	**275.57**	134.97	96.00%	-	0.00%
Replace Disconnects (2025–2026)	-	-	-	-	145.30	(1.53)	1,245.50	1,243.97	-	**1,390.80**	-	-	-	-	146.83	234.23	855.61	-	**1,236.68**	(154.12)	-11.08%	(154.12)	-12.39%
Refurbish Marine Terminal (2025–2026) - Holyrood	-	-	-	-	1,190.80	540.84	1,295.60	1,836.44	-	**2,486.40**	-	-	-	-	467.81	109.97	1,726.47	-	**2,304.25**	(182.15)	-7.33%	-	0.00%
Replace Instrument Transformers (2025–2026)	-	-	-	-	112.50	437.20	356.40	793.60	-	**468.90**	-	-	-	-	131.23	300.13	964.59	-	**1,395.96**	927.06	197.71%	471.13	59.37%
Renew Circuit Breakers (2025–2026)	-	-	-	-	129.70	321.07	2,531.30	2,852.37	-	**2,661.00**	-	-	-	-	91.63	368.34	2,484.02	-	**2,944.00**	283.00	10.64%	-	0.00%
Replace 250 Vdc Battery Bank (2025–2026) - Stephenville	-	-	-	-	73.00	38.15	296.90	335.05	-	**369.90**	-	-	-	-	34.85	28.22	306.83	-	**369.90**	-	0.00%	-	0.00%
Replace Terminal Station Battery Banks and Chargers (2025–2026)	-	-	-	-	123.20	46.37	315.30	361.67	-	**438.50**	-	-	-	-	76.83	144.98	216.69	-	**438.50**	-	0.00%	-	0.00%
Replace Igniter System (2025-2026) - Harwoods & Stephenville	-	-	-	-	341.41	341.41	104.06	445.47	-	**445.47**	-	-	-	-	-	248.37	197.10	-	**445.47**	-	0.00%	-	0.00%
Replace Protective Relays (2025–2026)	-	-	-	-	668.60	275.52	2,282.60	2,558.12	-	**2,951.20**	-	-	-	-	393.09	956.03	1,602.09	-	**2,951.21**	0.01	0.00%	-	0.00%
Upgrade Power Transformers (2025–2026)	-	-	-	-	811.90	1,150.47	1,173.90	2,324.37	-	**1,985.80**	-	-	-	-	407.88	241.56	2,082.82	-	**2,732.25**	746.45	37.59%	-	0.00%
Install Carbon Dust Collection System (2025–2026) - Hinds Lake	-	-	-	-	244.90	97.98	376.00	473.98	-	**620.90**	-	-	-	-	146.92	24.80	449.18	-	**620.90**	-	0.00%	-	0.00%
Replace Circuit Breaker Reclosing Controllers (2025–2026) - Cow Head and Massey Drive	-	-	-	-	104.60	81.12	164.30	245.42	-	**268.90**	-	-	-	-	23.48	42.09	203.33	-	**268.90**	-	0.00%	-	0.00%
Perform Major Inspection - Synchronous Condenser 2 (2025–2026) - Wabush	-	-	-	-	22.80	(827.71)	1,249.03	421.32	-	**1,271.83**	-	-	-	-	850.54	60.96	360.32	-	**1,271.83**	-	0.00%	(0.03)	-0.01%
Install Breaker Failure Protection (2025–2027) - Holyrood	-	-	-	-	177.80	(7.44)	320.90	313.46	166.50	**665.20**	-	-	-	-	185.24	110.64	75.85	-	**371.73**	(293.47)	-44.12%	(126.97)	-40.50%
Upgrade Data Alarm Systems (2025–2026) - Hardwoods	-	-	-	-	184.00	143.37	188.70	332.07	-	**372.70**	-	-	-	-	40.63	77.85	254.22	-	**372.70**	-	0.00%	-	0.00%
Replace Diesel Gensets (2025–2027)	-	-	-	-	418.20	53.29	1,718.99	1,772.28	4,086.41	**6,223.60**	-	-	-	-	364.91	322.60	1,449.69	4,086.41	**6,223.60**	0.00	0.00%	0.00	0.00%
Replace Human Machine Interface (2025) - Stephenville	-	-	-	-	277.00	154.42	-	154.42	-	**277.00**	-	-	-	-	283.58	27.22	127.20	-	**438.00**	161.00	58.12%	-	0.00%
Refurbish Intake 2 (2025–2026) - Bay d'Espoir	-	-	-	-	284.40	467.67	3,069.40	3,537.07	-	**3,353.80**	-	-	-	-	134.21	727.16	3,231.33	-	**4,092.69**	738.89	22.03%	421.41	11.91%
Perform Level 2 Condition Assessment - Unit 7 Intake and Draft Tube (2025) - Bay d'Espoir	-	-	-	-	471.50	593.64	-	593.64	-	**471.50**	-	-	-	-	529.09	102.75	490.89	-	**1,122.73**	651.23	138.12%	-	0.00%
Replace Power Line Carrier (2024-2025) - TL247	-	-	-	87.20	667.40	231.00	-	231.00	-	**754.60**	-	-	-	88.18	435.42	67.96	163.05	-	**754.60**	-	0.00%	-	0.00%
Replace Diesel Gensets (2024–2026)	-	-	-	535.80	478.00	(2,112.98)	2,404.67	291.69	-	**3,418.47**	-	-	-	180.01	2,447.59	391.92	1,397.40	-	**4,416.92**	998.45	29.21%	1,497.63	513.43%
Replace Annunciator - Phase 2 (2024–2025) - Bay d'Espoir	-	-	-	294.10	187.50	228.63	-	228.63	-	**481.60**	-	-	-	147.88	786.32	243.95	(15.32)	-	**1,162.83**	681.23	141.45%	-	0.00%
Upgrade Distribution (2024–2025) - Bay d'Espoir Terminal Station 2	-	-	-	93.20	331.50	118.58	-	118.58	-	**424.70**	-	-	-	75.95	372.55	66.22	52.36	-	**567.08**	142.38	33.52%	-	0.00%
Upgrade Data Alarm Systems (2024–2025) - Western Avalon Terminal Station	-	-	-	137.00	156.90	177.88	-	177.88	-	**293.90**	-	-	-	42.76	92.96	44.96	132.92	-	**313.60**	19.70	6.70%	-	0.00%
Penstock Life Extension - Phase 1 (2023–2025)	-	-	2,105.00	5,748.29	58,022.73	847.23	-	847.23	-	**65,876.02**	-	-	1,132.36	6,720.93	54,190.60	247.33	599.90	-	**62,891.12**	(2,984.90)	-4.53%	-	0.00%
Replace Circuit Breaker Reclosing Controllers (2023–2024) - Hardwoods	-	-	81.60	149.60	-	106.37	-	106.37	-	**231.20**	-	-	43.84	129.77	132.17	11.07	95.30	-	**412.15**	180.95	78.27%	-	0.00%
Diesel Genset Replacement Program (2023–2025)	-	-	819.10	174.00	1,415.10	71.77	-	71.77	-	**2,408.20**	-	-	683.62	598.79	2,102.94	119.00	(47.23)	-	**3,457.12**	1,048.92	43.56%	-	0.00%
Replace Unit 2047 (2021–2023) - Ramea	307.71	2,010.80	118.30	-	-	41.28	-	41.28	-	**2,436.81**	49.04	216.05	1,096.33	1,226.50	538.16	59.80	(18.52)	-	**3,167.37**	730.56	29.98%	-	0.00%
Refurbish Ebbegunbaeg Control Structure	3,236.82	3,238.30	3,470.10	2,781.60	4,952.20	2,042.43	-	2,042.43	-	**17,679.02**	2,196.44	4,301.54	3,923.59	5,494.12	5,398.46	1,001.06	1,638.82	-	**23,954.03**	6,275.01	35.49%	597.45	29.25%
Total	**3,544.53**	**5,249.10**	**6,594.10**	**10,000.79**	**98,581.24**	**13,928.05**	**88,685.41**	**102,613.47**	**33,987.81**	**246,642.99**	**2,245.48**	**4,517.59**	**6,879.75**	**14,704.89**	**97,764.80**	**21,893.43**	**86,695.53**	**33,737.41**	**268,438.87**	**21,795.88**		**5,975.49**	

[1] Numbers may not add due to rounding.

2026 Capital Expenditures By Investment Classification
General Plant
($000)[1]

	Capital Budget									Actual Expenditure and Forecast								Variance			
	A				B	C	D (B+C)	E	F (A+C+E)	G				H	I	J	K (G+H+I+J)	K-F		H-D	
Project	2022	2023	2024	2025	Carryover to 2026	Original 2026	Revised 2026	2027 and Beyond	Total	2022	2023	2024	2025	Original 2026	2026 Forecast Remaining Jun–Dec	Beyond	Total	Project		Annual	
Perform Facilities Refurbishments (2026)	-	-	-	-	-	3,027.90	3,027.90	-	**3,027.90**	-	-	-	-	112.42	2,915.48	-	**3,027.90**	-	0.00%	-	0.00%
Fabricate and Install Stoplog Storage Racks (2026–2027) - Bay d'Espoir	-	-	-	-	-	85.00	85.00	659.10	**744.10**	-	-	-	-	-	85.00	659.10	**744.10**	-	0.00%	-	0.00%
Replace Backup Generators at Microwave Repeater Sites (2026–2027)	-	-	-	-	-	94.50	94.50	391.30	**485.80**	-	-	-	-	39.32	55.18	391.30	**485.80**	-	0.00%	-	0.00%
Replace Network Communications Equipment (2026–2027)	-	-	-	-	-	1,038.40	1,038.40	99.00	**1,137.40**	-	-	-	-	191.29	847.11	99.00	**1,137.40**	-	0.00%	-	0.00%
Telecommunications In-Service Failures (2026)	-	-	-	-	-	123.60	123.60	-	**123.60**	-	-	-	-	74.08	49.52	-	**123.60**	-	0.00%	-	0.00%
Upgrade Remote Terminal Units (2026)	-	-	-	-	-	252.20	252.20	-	**252.20**	-	-	-	-	15.24	236.96	-	**252.20**	-	0.00%	-	0.00%
Purchase Tools and Equipment (2026)	-	-	-	-	-	1,849.36	1,849.36	-	**1,849.36**	-	-	-	-	308.44	1,540.93	-	**1,849.36**	-	0.00%	-	0.00%
Install CCTV Systems (2026)	-	-	-	-	-	450.20	450.20	-	**450.20**	-	-	-	-	47.93	402.27	-	**450.20**	-	0.00%	-	0.00%
Replace 48 V Battery Banks and Chargers (2026–2027)	-	-	-	-	-	250.10	250.10	524.40	**774.50**	-	-	-	-	45.95	204.15	524.40	**774.50**	-	0.00%	-	0.00%
Procure Accommodations (2026) - Makkovik	-	-	-	-	-	684.70	684.70	-	**684.70**	-	-	-	-	198.99	485.71	-	**684.70**	-	0.00%	-	0.00%
Replace GRID Application (2026–2027)	-	-	-	-	-	134.95	134.95	363.85	**498.80**	-	-	-	-	3.02	131.92	363.85	**498.80**	-	0.00%	-	0.00%
Implement Safety Audits and Inspections System (2026)	-	-	-	-	-	304.70	304.70	-	**304.70**	-	-	-	-	-	304.70	-	**304.70**	-	0.00%	-	0.00%
Modify Office Buildings and Procure Furniture, Fixtures, and Equipment (2026)	-	-	-	-	-	447.50	447.50	-	**447.50**	-	-	-	-	150.44	297.06	-	**447.50**	-	0.00%	-	0.00%
Roll Out Document Control System (2026)	-	-	-	-	-	607.30	607.30	-	**607.30**	-	-	-	-	-	-	-	**-**	(607.30)	-100.00%	(607.30)	-100.00%
Purchase Personal Computers (2026)	-	-	-	-	-	1,115.70	1,115.70	-	**1,115.70**	-	-	-	-	452.40	663.30	-	**1,115.70**	-	0.00%	-	0.00%
Replace Peripheral Infrastructure (2026)	-	-	-	-	-	278.50	278.50	-	**278.50**	-	-	-	-	3.09	275.41	-	**278.50**	-	0.00%	-	0.00%
Upgrade Core OT Infrastructure (2026)	-	-	-	-	-	799.60	799.60	-	**799.60**	-	-	-	-	93.81	705.79	-	**799.60**	-	0.00%	-	0.00%
Update Cybersecurity Infrastructure (2026)	-	-	-	-	-	413.30	413.30	-	**413.30**	-	-	-	-	170.96	242.34	-	**413.30**	-	0.00%	-	0.00%
Perform Software Upgrades and Minor Enhancements - Operational Technology (2026)	-	-	-	-	-	262.80	262.80	-	**262.80**	-	-	-	-	18.47	244.33	-	**262.80**	-	0.00%	-	0.00%
Replace Heavy-Duty Vehicles (2026–2028)	-	-	-	-	-	1,524.10	1,524.10	2,992.90	**4,517.00**	-	-	-	-	5.68	1,518.42	2,992.90	**4,517.00**	-	0.00%	-	0.00%
Replace Light-Duty Vehicles (2026–2027)	-	-	-	-	-	2,547.50	2,547.50	548.60	**3,096.10**	-	-	-	-	5.18	2,542.32	548.60	**3,096.10**	-	0.00%	-	0.00%
Backup Critical Control Systems (2026) - Holyrood	-	-	-	-	-	329.40	329.40	-	**329.40**	-	-	-	-	269.46	59.94	-	**329.40**	-	0.00%	-	0.00%
Perform Software Upgrades and Minor Enhancements - Information Technology (2026–2027)	-	-	-	-	-	649.90	649.90	1,097.20	**1,747.10**	-	-	-	-	350.90	299.00	1,097.20	**1,747.10**	-	0.00%	-	0.00%
Migrate Legacy Applications (2026)	-	-	-	-	-	611.00	611.00	-	**611.00**	-	-	-	-	133.63	477.37	-	**611.00**	-	0.00%	-	0.00%
Upgrade Core IT Infrastructure (2026–2027)	-	-	-	-	-	871.64	871.64	522.86	**1,394.50**	-	-	-	-	21.58	850.06	522.86	**1,394.50**	-	0.00%	-	0.00%
Refurbish Meteorological Stations - Phase 2 (2026–2027)	-	-	-	-	-	528.10	528.10	167.40	**695.50**	-	-	-	-	21.07	507.03	167.40	**695.50**	-	0.00%	-	0.00%
Replace UPS System - Backup Control Center (2026) - Holyrood	-	-	-	-	-	322.80	322.80	-	**322.80**	-	-	-	-	23.05	299.75	-	**322.80**	-	0.00%	-	0.00%
Replace Teleprotection Equipment (2026–2028)	-	-	-	-	-	964.40	964.40	535.40	**1,499.80**	-	-	-	-	36.74	927.66	535.40	**1,499.80**	-	0.00%	-	0.00%
Replace Radio Link to Hydraulic Control Structure (2026–2027) - Ebbegunbaeg	-	-	-	-	-	470.50	470.50	756.80	**1,227.30**	-	-	-	-	9.77	460.73	756.80	**1,227.30**	-	0.00%	-	0.00%
Purchase Mobile Devices (2026)	-	-	-	-	-	315.90	315.90	-	**315.90**	-	-	-	-	0.51	315.39	-	**315.90**	-	0.00%	-	0.00%
Replace Walkway to Toe of Dam (2026–2027) - Paradise River	-	-	-	-	-	16.80	16.80	566.10	**582.90**	-	-	-	-	16.12	0.68	566.10	**582.90**	-	0.00%	-	0.00%
Replace Light-Duty Mobile Equipment (2026)	-	-	-	-	-	1,212.90	1,212.90	-	**1,212.90**	-	-	-	-	25.29	1,187.61	-	**1,212.90**	-	0.00%	-	0.00%
Replace Heavy-Duty Mobile Equipment (2026–2028)	-	-	-	-	-	173.80	173.80	3,921.90	**4,095.70**	-	-	-	-	5.20	168.60	3,921.90	**4,095.70**	-	0.00%	-	0.00%
Perform Accessibility Improvements (2025) - Hydro Place	-	-	-	742.09	552.20	-	552.20	-	**742.09**	-	-	-	189.89	47.49	504.72	-	**742.09**	-	0.00%	-	0.00%
Perform Office Renovations (2025-2026) - MOU	-	-	-	20.30	(31.05)	613.10	582.05	-	**633.40**	-	-	-	51.35	734.80	(152.76)	-	**633.40**	-	0.00%	-	0.00%
Upgrade Energy Management System (2025–2026)	-	-	-	284.40	257.12	188.50	445.62	-	**472.90**	-	-	-	27.28	17.53	428.10	-	**472.90**	-	0.00%	-	0.00%
Replace Interconnect Microwave Radios (2025)	-	-	-	1,103.00	329.99	-	329.99	-	**1,103.00**	-	-	-	669.39	170.15	159.85	-	**999.39**	(103.61)	-9.39%	-	0.00%
Replace GPS Clocks (2025–2026)	-	-	-	448.30	143.45	132.40	275.85	-	**580.70**	-	-	-	304.85	144.73	131.12	-	**580.70**	-	0.00%	-	0.00%
Install Fire Protection - 230 kV Stations (2025–2026) - Come by Chance	-	-	-	51.70	25.13	534.50	559.63	-	**586.20**	-	-	-	26.57	21.99	537.65	-	**586.20**	-	0.00%	-	0.00%
Replace Mobile Equipment (2025–2027)	-	-	-	1,973.60	2,212.07	54.60	2,266.67	2,619.40	**4,647.60**	-	-	-	344.44	1,373.65	893.02	2,619.40	**5,230.52**	582.92	12.54%	0.00	0.00%
Replace Light- and Heavy-Duty Vehicles (2025–2027)	-	-	-	2,714.60	2,601.79	1,675.80	4,277.59	3,147.20	**7,537.60**	-	-	-	412.81	2,027.49	2,250.10	3,147.20	**7,837.60**	300.00	3.98%	(0.00)	0.00%
Install Electric Vehicle Chargers (2025–2026) - Hydro Sites	-	-	-	368.00	149.64	288.20	437.84	-	**656.20**	-	-	-	218.36	57.16	380.68	-	**656.20**	-	0.00%	-	0.00%
Implement SCADA Points Application (2025–2026)	-	-	-	241.90	143.46	143.40	286.86	-	**385.30**	-	-	-	98.44	104.47	182.39	-	**385.30**	-	0.00%	-	0.00%
Upgrade Work Protection Code Application (2025–2026)	-	-	-	452.00	(257.67)	256.64	(1.03)	-	**708.64**	-	-	-	592.21	-	(1.03)	-	**591.18**	(117.46)	-16.58%	0.00	0.00%
ArcGIS - Electronic Tailboards (2025)	-	-	-	250.80	244.37	-	244.37	-	**250.80**	-	-	-	6.43	23.43	220.94	-	**250.80**	-	0.00%	-	0.00%
Project Controls Management System - Major Projects (2025)	-	-	-	252.40	136.53	-	136.53	-	**252.40**	-	-	-	115.87	(63.16)	199.69	-	**252.40**	0.00	0.00%	-	0.00%
Replacement of Reporting Management Tools (2025–2026)	-	-	-	1,518.61	1,510.30	195.89	1,706.19	-	**1,714.50**	-	-	-	8.32	18.28	1,687.90	-	**1,714.50**	-	0.00%	-	0.00%
Replace VHF Radio System (2024–2025)	-	-	1,261.60	290.60	349.17	-	349.17	-	**1,552.20**	-	-	128.56	1,380.45	151.19	197.98	-	**1,858.18**	305.98	19.71%	-	0.00%
Replace Powerhouse 1 Roof (2024-2025) - Bay d'Espoir	-	-	140.20	1,819.20	285.96	-	285.96	-	**1,959.40**	-	-	79.44	1,962.96	24.50	261.46	-	**2,328.37**	368.97	18.83%	-	0.00%
Install Public EV Ultra Fast Charger (2024) - Conne River	-	-	219.99	242.57	221.96	-	221.96	-	**462.57**	-	-	7.74	232.87	51.12	170.84	-	**462.57**	-	0.00%	-	0.00%
Replace Plant Lighting (2024) - Holyrood	-	-	139.77	549.53	433.05	-	433.05	-	**689.30**	-	-	141.27	114.98	87.46	345.59	-	**689.30**	-	0.00%	-	0.00%
Replace Light- and Heavy-Duty Vehicles (2024–2026)	-	-	1,479.10	4,148.80	1,834.43	1,133.40	2,967.83	-	**6,761.30**	-	-	2,053.79	3,218.97	215.45	2,752.38	-	**8,240.59**	1,479.29	21.88%	-	0.00%
Purchase 50' Material Handler Aerial Device on Tracked Unit (2024–2026) - Happy Valley Goose Bay	-	-	24.00	841.80	114.46	7.10	121.56	-	**872.90**	-	-	22.45	652.63	122.82	(1.26)	-	**796.65**	(76.25)	-8.74%	-	0.00%
Refurbish Control Building (2024–2025) - Grandy Brook and Doyles	-	-	109.40	444.70	171.74	-	171.74	-	**554.10**	-	-	154.11	588.03	101.75	69.99	-	**913.88**	359.78	64.93%	-	0.00%
Install Ultra-Fast dc Electric Vehicle Chargers - Supplemental	-	62.50	1,766.00	231.30	275.04	-	275.04	-	**2,059.80**	-	11.24	1,040.15	1,453.38	166.45	108.59	-	**2,779.80**	720.00	34.95%	-	0.00%
Upgrade Water and Fire Suppression Systems (2023–2024) - Bishop's Falls	-	353.70	2,886.30	-	1,579.55	-	1,579.55	-	**3,240.00**	-	316.19	410.13	3,494.13	884.08	695.47	-	**5,800.00**	2,560.00	79.01%	-	0.00%
Total	**-**	**416.20**	**8,026.36**	**18,990.21**	**13,282.70**	**27,982.58**	**41,265.28**	**18,913.41**	**74,328.76**	**-**	**327.42**	**4,037.65**	**16,164.61**	**9,332.88**	**31,325.10**	**18,913.41**	**80,101.08**	**5,772.31**		**(607.30)**	

[1] Numbers may not add due to rounding.

2026 Capital Expenditures By Investment Classification
System Growth
($000)[1]

	Capital Budget										Actual Expenditure and Forecast										Variance			
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F		H-D	
Project	2021	2022	2023	2024	2025	Carryover to 2026	Original 2026	Revised 2026	2027 and Beyond	Total	2021	2022	2023	2024	2025	Original 2026	2026 Forecast Remaining Jun–Dec	Beyond	Total	Project		Annual	
Additions for Load Growth and Customer Interconnection - English Harbour West (2026-2027)	-	-	-	-	-	-	2,559.10	2,559.10	691.60	**3,250.70**	-	-	-	-	-	234.31	2,324.79	691.60	**3,250.70**	-	0.00%	-	0.00%
Additions for Load - Cartwright (2024–2027)	-	-	-	19.72	0.89	6.75	0.93	7.68	486.29	**507.83**	-	-	-	-	13.86	16.95	(9.27)	486.29	**507.83**	-	0.00%	-	0.00%
Additions for Load Growth - Unit 2065 Replacement and Fuel Storage Upgrades (2024–2027) - Rigolet	-	-	-	50.07	226.36	(1,162.08)	3,082.90	1,920.82	69.89	**3,429.22**	-	-	-	21.87	1,831.30	232.15	1,688.67	69.89	**3,843.88**	414.67	12.09%	-	0.00%
Additions for Load Growth - Upgrade Transformer Capacity (2023–2024) - Jean Lake Terminal Station	-	-	580.00	-	6,459.60	4,582.98	-	4,582.98	3,960.10	**10,999.70**	-	-	52.02	596.75	1,807.86	64.63	855.08	-	**3,376.34**	(7,623.36)	-69.31%	(3,663.27)	-79.93%
Wabush Terminal Station Upgrades	2,301.72	4,935.50	1,632.90	3,808.00	-	254.72	-	254.72	-	**12,678.12**	794.01	1,843.19	7,992.32	4,607.69	1,680.20	189.24	65.48	-	**17,172.12**	4,494.00	35.45%	-	0.00%
Total	**2,301.72**	**4,935.50**	**2,212.90**	**3,877.79**	**6,686.84**	**3,682.37**	**5,642.93**	**9,325.30**	**5,207.88**	**30,865.56**	**794.01**	**1,843.19**	**8,044.34**	**5,226.30**	**5,333.21**	**737.28**	**4,924.75**	**1,247.79**	**28,150.87**	**(2,714.69)**		**(3,663.27)**	

[1] Numbers may not add due to rounding.

2026 Capital Expenditures By Investment Classification
Access
($000)[1]

Project	Capital Budget								Actual Expenditure and Forecast								Variance			
	A				B	C	D (B+C)	E	F (A+C+E)	G				H	I	J	K (G+H+I+J)	K-F		H-D	
	2022	2023	2024	2025	Carryover to 2026	Original 2026	Revised 2026	2027 and Beyond	Total	2022	2023	2024	2025	Original 2026	2026 Forecast Remaining Jun–Dec	Beyond	Total	Project		Annual	
Provide Service Extensions (2026)	-	-	-	-	-	5,401.90	5,401.90	-	**5,401.90**	-	-	-	-	1,920.88	3,481.02	-	**5,401.90**	(0.00)	0.00%	(0.00)	0.00%
Battle Harbour Data Solutions Interconnection (2027)	-	-	-	-	-	334.40	334.40	264.70	**599.10**	-	-	-	-	-	334.40	264.70	**599.10**	-	0.00%	-	0.00%
Upgrade Hydro Road (2026–2027) - Hillcrest	-	-	-	-	-	408.70	408.70	932.70	**1,341.40**	-	-	-	-	9.33	399.37	932.70	**1,341.40**	-	0.00%	-	0.00%
Interconnection and Integration of the Puffin Wind Inc. Renewable Energy Project (2025–2027) - Rannia	-	-	-	344.20	128.59	901.80	1,030.39	32.00	**1,276.00**	-	-	-	215.61	47.77	982.61	31.00	**1,276.00**	-	-	-	-
Total	-	-	-	**344.20**	**128.59**	**7,046.80**	**7,175.39**	**1,249.40**	**8,640.40**	-	-	-	**215.61**	**1,977.98**	**5,197.41**	**1,249.40**	**8,640.40**	**(0.00)**		(0.00)	

[1] Numbers may not add due to rounding.

2026 Capital Expenditures By Investment Classification
Service Enhancement
($000)[1]

	Capital Budget									Actual Expenditure and Forecast								Variance			
	A				B	C	D (B+C)	E	F (A+C+E)	G				H	I	J	K (G+H+I+J)	K-F		H-D	
Project	2022	2023	2024	2025	Carryover to 2026	Original 2026	Revised 2026	2027 and Beyond	Total	2022	2023	2024	2025	2026	2026 Forecast Remaining Jun–Dec	Beyond	Total	Project		Annual	
Remove Safety Hazards (2026)	-	-	-	-	-	240.60	240.60	-	**240.60**	-	-	-	-	28.28	212.32	-	**240.60**	-	0.00%	-	0.00%
Install Dam Monitoring Equipment - Roddickton	-	-	-	-	-	51.60	51.60	-	**51.60**	-	-	-	-	-	51.60	-	**51.60**	-	0.00%	-	0.00%
Perform Minor Telecommunications Enhancements (2026)	-	-	-	-	-	175.50	175.50	-	**175.50**	-	-	-	-	73.30	102.20	-	**175.50**	-	0.00%	-	0.00%
Install Intelligent Electronic Devices Management Software (2026–2028)	-	-	-	-	-	297.20	297.20	973.00	**1,270.20**	-	-	-	-	52.40	244.80	973.00	**1,270.20**	-	0.00%	-	0.00%
Upgrade Excitation System (2026–2027) - Paradise River	-	-	-	-	-	218.70	218.70	203.50	**422.20**	-	-	-	-	28.71	189.99	203.50	**422.20**	-	0.00%	-	0.00%
Replace Expansion Joint and Rock Scaling (2026–2027) - Paradise River	-	-	-	-	-	516.90	516.90	230.40	**747.30**	-	-	-	-	29.66	487.24	230.40	**747.30**	-	0.00%	-	0.00%
Upgrade Cooling (2026–2027) - Hardwoods	-	-	-	-	-	100.60	100.60	344.50	**445.10**	-	-	-	-	40.05	60.55	344.50	**445.10**	-	0.00%	-	0.00%
Relocate Section of Line (2026–2028) - TL220	-	-	-	-	-	79.70	79.70	4,011.70	**4,091.40**	-	-	-	-	27.65	52.05	4,011.70	**4,091.40**	-	0.00%	-	0.00%
Upgrade Worst-Performing Distribution Feeders (2026–2027)	-	-	-	-	-	756.30	756.30	3,534.90	**4,291.20**	-	-	-	-	11.09	745.21	3,534.90	**4,291.20**	-	0.00%	-	0.00%
Upgrade Terminal Station for Mobile Substation (2026–2027) - St. Anthony Diesel	-	-	-	-	-	66.10	66.10	328.60	**394.70**	-	-	-	-	15.31	50.79	328.60	**394.70**	-	0.00%	-	0.00%
Install Mid-Span Structures - TL220 (2025–2026)	-	-	-	881.30	666.66	229.30	895.96	-	**1,110.60**	-	-	-	214.64	177.45	718.51	-	**1,110.60**	-	0.00%	-	0.00%
Install Dynamic Line Rating System (2025–2026)	-	-	-	2.20	2.20	593.30	595.50	-	**595.50**	-	-	-	-	0.32	595.18	-	**595.50**	-	0.00%	-	0.00%
Upgrade Worst-Performing Distribution Feeders (2025–2027)	-	-	-	2,678.90	2,455.89	3,677.40	6,133.29	2,529.80	**8,886.10**	-	-	-	223.01	1,201.09	4,932.20	2,529.80	**8,886.10**	-	0.00%	-	0.00%
Upgrade Instrumentation (2024–2025) - Hardwoods Gas Turbine	-	-	60.90	157.20	96.83	-	96.83	-	**218.10**	-	-	95.78	360.48	25.01	71.81	-	**553.09**	334.99	153.59%	-	0.00%
Automate Bulk Metering (2024–2026)	-	-	302.60	214.40	123.57	289.70	413.27	-	**806.70**	-	-	171.46	221.97	91.24	267.63	-	**752.30**	(54.40)	-6.74%	(54.40)	-13.16%
Purchase Spare Generator Step-Up Transformer (2023–2028)	-	39.60	1,298.90	1,822.10	2,298.81	-	2,298.81	9,162.90	**12,323.50**	-	17.53	51.05	793.21	26.39	2,272.42	9,163.40	**12,324.00**	0.50	0.00%	-	0.00%
Total	**-**	**39.60**	**1,662.40**	**5,756.10**	**5,643.96**	**7,292.90**	**12,936.86**	**21,319.30**	**36,070.30**	**-**	**17.53**	**318.29**	**1,813.31**	**1,827.94**	**11,054.52**	**21,319.80**	**36,351.39**	**281.09**		**(54.40)**	

[1] Numbers may not add due to rounding.

2026 Capital Expenditures By Investment Classification
Mandatory
($000)[1]

	Capital Budget									Actual Expenditure and Forecast									Variance			
	A				B	C	D (B+C)	E	F (A+C+E)	G				H	I	J	K (G+H+I+J)	K-F		H-D	
Project	2022	2023	2024	2025	Carryover to 2026	Original 2026	Revised 2026	2027 and Beyond	Total	2022	2023	2024	2025	2026	2026 Forecast Remaining Jun–Dec	Beyond	Total	Project		Annual	
Purchase Meters and Metering Equipment (2026)	-	-	-	-	-	705.60	705.60	-	**705.60**	-	-	-	-	83.51	622.09	-	**705.60**	-	0.00%	-	0.00%
Upgrade PLX Metering System (2026–2028) - Labrador East	-	-	-	-	-	1,188.80	1,188.80	980.10	**2,168.90**	-	-	-	-	14.91	1,173.89	980.10	**2,168.90**	-	0.00%	-	0.00%
Purchase Meters and Metering Equipment (2025–2026)	-	-	-	446.20	(137.70)	278.40	140.70	-	**724.60**	-	-	-	583.90	164.41	(23.71)	-	**724.60**	0.00	0.00%	-	0.00%
Total	-	-	-	**446.20**	**(137.70)**	**2,172.80**	**2,035.10**	**980.10**	**3,599.10**	-	-	-	**583.90**	**262.83**	**1,772.27**	**980.10**	**3,599.10**	**0.00**	**0.00**	-	-

1 Numbers may not add due to rounding.

Appendix B

Capital Expenditures and Carryover Report for the Year Ended December 31, 2025



Newfoundland and Labrador Hydro
Hydro Place. 500 Columbus Drive
P.O. Box 12400. St. John's. NL
Canada A1B 4K7
t. 709.737.1400 I f. 709.737.1800
nlhydro.com

April 1, 2026

Board of Commissioners of Public Utilities
Prince Charles Building
120 Torbay Road, P.O. Box 21040
St. John's, NL A1A 5B2

Attention: Mike McNiven
Board Secretary

Re: Capital Expenditures and Carryover Report for the Year Ended December 31, 2025

Enclosed please find Newfoundland and Labrador Hydro's ("Hydro") "Capital Expenditures and Carryover Report for the Year Ended December 31, 2025," filed pursuant to the Board of Commissioners of Public Utilities ("Board") Order No. P.U. 28(2024), and in compliance with Section 41(4) of the *Public Utilities Act.*

This report provides information on Hydro's capital expenditures for all programs and projects proposed and approved as part of its "2025 Capital Budget Application"[1] and additional supplemental capital budgets approved by the Board. As per the "Capital Budget Application Guidelines (Provisional),"[2] this report provides key performance indicator data as well as details and explanations of reportable variances between budgeted and actual expenditures for programs and projects with expenditures in 2025. This report also provides a listing of budgets carried over to future years and specific details regarding the execution of the Remove Safety Hazards (2025) program, the Perform Software Upgrades and Minor Enhancements (2025) program, various In-Service Failures programs, and the Boiler Condition Assessment and Miscellaneous Upgrades (2025) – Holyrood program.

Should you have any questions, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO

Shirley A. Walsh
Senior Legal Counsel, Regulatory
SAW/sk

Encl.

[1] "2025 Capital Budget Application," Newfoundland and Labrador Hydro, July 16, 2024.
[2] "Capital Budget Application Guidelines (Provisional)," Board of Commissioners of Public Utilities, January 2022.

Mike McNiven 2
Board of Commissioners of Public Utilities

ecc:

Board of Commissioners of Public Utilities Jacqui H. Glynn
Ryan Oake
Board General

Island Industrial Customer Group
Paul L. Coxworthy, Stewart McKelvey
Denis J. Fleming, Cox & Palmer
Glen G. Seaborn, Poole Althouse

Labrador Interconnected Group
Senwung F. Luk, Olthuis Kleer Townshend LLP
Nicholas E. Kennedy, Olthuis Kleer Townshend LLP

Consumer Advocate
Adrienne H.Y. Ding, O'Dea Earle
Justin W. King, O'Dea Earle

Newfoundland Power Inc. Dominic J. Foley
Douglas W. Wright
Regulatory Email

Capital Expenditures and Carryover Report

For the Year Ended December 31, 2025

April 1, 2026

A report to the Board of Commissioners of Public Utilities





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1.0 Overview

This report is filed pursuant to correspondence from the Board of Commissioners of Public Utilities ("Board") on February 13, 2023,[1] Board Order No. P.U. 28(2024), and in compliance with Section 41(4) of the *Public Utilities Act ("Act").*[2] It provides information on Newfoundland and Labrador Hydro's ("Hydro") capital expenditures for all programs and projects proposed and approved as part of the 2025 Capital Budget Application ("CBA").[3] As noted within this report, information is also provided on capital expenditures related to additional supplemental capital budgets approved by the Board. As per the "Capital Budget Application Guidelines (Provisional)" ("Provisional Guidelines"),[4] this report provides key performance indicator ("KPI") data as well as details and explanations regarding the reportable variances between budgeted and actual expenditures for programs and projects with expenditures in the 2025 calendar year. Appendix A provides the variances by investment classification, and Appendix B provides specific details regarding the execution of the following programs:

- Remove Safety Hazards (2025);
- Perform Software Upgrades and Minor Enhancements (2025);
- In-Service Failures (2025) for various asset categories; and
- Perform Boiler Condition Assessment and Miscellaneous Upgrades (2025) – Holyrood.

Historically, Information Systems ("IS") sat within Nalcor Energy ("Nalcor") and was charged to Hydro through an administration fee; however, following the amalgamation of Nalcor and Hydro, effective January 1, 2025, these assets are now owned by Hydro and are not exempt from the *Act.* Therefore, any IS expenditures for new Information Technology ("IT") assets, as well as sustaining capital on existing IT assets, will now be subject to application to the Board pursuant to the *Act.*

There are certain 2025 capital expenditures for which Nalcor had approved, initiated and completed the procurement required for the project prior to amalgamation. As a result of amalgamation, Hydro is now bound to any contractual agreements of Nalcor and proceeded with the execution of any applicable capital work accordingly. These projects and programs are outlined in Appendix C to this report. Hydro has applied to the Board to transfer these assets from the non-regulated business segment to Hydro's

[1] "Annual Capital Expenditures Reports – Filing Schedule," Board of Commissioners of Public Utilities, February 13, 2023.
[2] *Public Utilities Act*, RSNL 1990, c P-47, s 41(4).
[3] "2025 Capital Budget Application," Newfoundland and Labrador Hydro, July 16, 2024.
[4] "Capital Budget Application Guidelines (Provisional)," Board of Commissioners of Public Utilities, January 2022.

regulated business segment in its Application for the Recovery of Costs Associated with Information Systems Assets,[5] which is pending review and approval by the Board. For 2025 capital expenditures for which no procurement commitments had been made upon amalgamation, Hydro applied to the Board for approval of these projects throughout 2025, as required by the *Act*.

1.1 Expenditures[6]

Hydro's 2025 capital expenditures totalled $223.5 million, excluding Major Projects currently before the Board.[7] Renewal of existing assets was the largest driver of investment in 2025, accounting for $167.3 million. General Plant and Service Enhancement investments accounted for $32.9 million and $9.4 million, respectively, followed by Access at $5.6 million, System Growth at $6.3 million, and Mandatory investments at $2.1 million.

Expenditures by asset category are provided in Appendix A.

1.2 Expenditures Compared to Approved Budget

Expenditures in Hydro's overall capital campaign for 2025 were under budget by $12.9 million (5.5%). Hydro completed an analysis of 2025 capital expenditure variances to determine the categories of under- and over-expenditure variances from the approved capital budget.

The primary category of capital under-expenditures in 2025 was carryover of work to future years, including deferred completion of some projects, carryover of activities within some multi-year projects, and re-pacing of scopes of work within various programs.

The primary category of capital over-expenditures in 2025 was planned work completed at a net higher cost than the original budget estimates, mostly associated with required expenditures that were not anticipated at the time of the original budget estimates. Another significant category of over-expenditures was refurbishment work to address findings of condition assessments, with expenditures

[5] "Recovery of Costs Associated with Information Systems Assets," Newfoundland and Labrador Hydro, April 1, 2026.
[6] Numbers may not add due to rounding.
[7] This total does not include expenditures related to Hydro's Early Execution Application for the Avalon Combustion Turbine and Bay d'Espoir Unit 8 projects, approved in Board Order P.U. No. 17(2025) for $47.4 million. Hydro's expenditures and forecast information for these projects are reported separately to the Board monthly. For information on Hydro's 2025 year-end expenditures, please refer to "Major Projects Monthly Update," Newfoundland and Labrador Hydro, February 16, 2026, Appendix B.

exceeding the budget allowances for such work. Sections 2.0 and 4.0 of this report provide more details on under- and over-expenditures.

1.3 Carryover

In 2025, Hydro carried over $36.5 million of budget to future years; this includes carryover of $14.5 million associated with the deferred completion of scopes previously planned for completion in 2025 and $22.0 million associated with reallocation of cost flow within the years of approved projects and programs. For comparison, the average carryover amount for the previous ten years, 2016–2025, was $29.8 million. Section 6.0 provides the overall carryover amount for the ten years 2016–2025.

Hydro's analysis of 2025 expenditure variances concluded that the main drivers of carryover of capital activities from 2025 to future years were:

- Challenges scheduling sufficient design and construction resources for the volume and timing of required work;
- Deliberate pause of work for re-assessment of the scope, budget, required timing, and/or justification;
- Delayed delivery of materials from vendors;
- Design and procurement challenges; and
- Unavailability of required specialized tools or equipment.

This carryover was partially offset by the necessary advancement of some project and program activities from future years into 2025, as well as carryover from 2024 to 2025. Sections 2.0 and 6.0 provide additional details on carryover.

2.0 Capital Budget versus Actual Expenditures 2015–2024

Appendix A provides a summary of capital expenditures for programs and projects that were active in 2025, with associated expenditures broken out annually for the periods 2021–2025 (expenditures) and 2026 and beyond (forecast). Table 1 and Chart 1 provide a summary of Hydro's capital budget variances for the years 2016–2025.

Table 1: Capital Budget vs. Expenditures 2016–2025

Year	Approved Budget ($000)	Expenditures ($000)	Variance ($000)
2025	236,408	223,535	(12,873)
2024	134,200	154,176	19,976
2023	146,403	148,876	2,473
2022	138,136	103,408	(34,728)
2021	136,304	113,492	(22,812)
2020	134,752	87,555	(47,197)
2019	164,194	126,575	(37,619)
2018	213,050	156,985	(56,065)
2017	340,501	340,741	240
2016	350,601	203,941	(146,660)

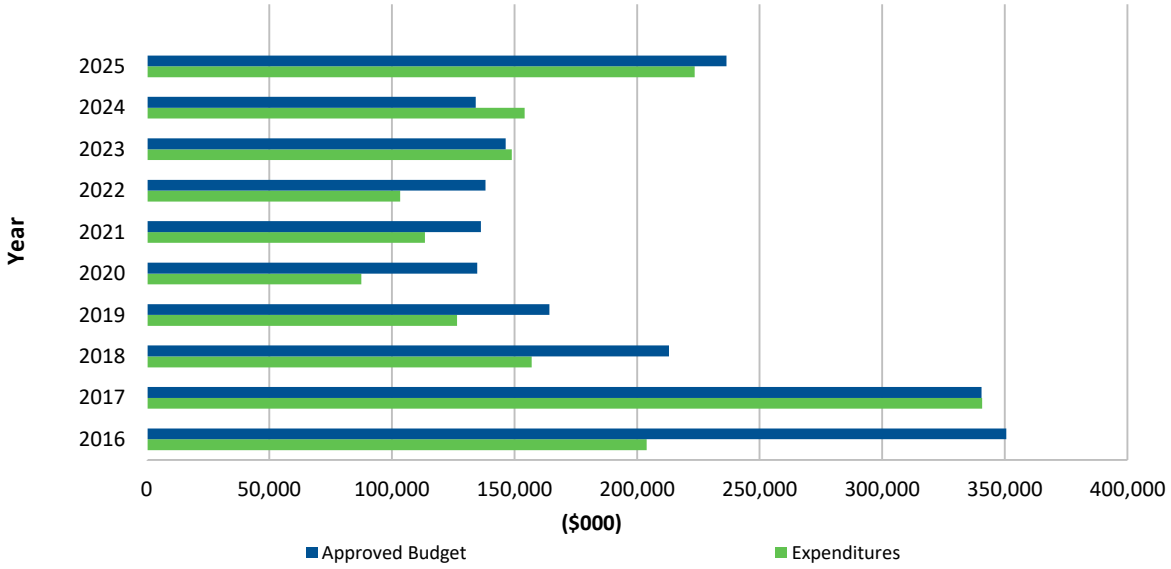


Chart 1: Capital Budgets vs. Actual Expenditures 2016–2025

In 2025, expenditures were under budget in Hydro's overall capital campaign by $12.9 million (5.5%), as shown in Table 2 and Chart 1. Hydro completed an analysis of the expenditure variances for the 2025 capital campaign to determine the categories of variances from the approved capital budget.

The main category of 2025 program and project under-expenditures was carryover of activities to future years, including:

- Re-paced scopes of work within programs;

- Carryover of activities within multi-year projects; and
- Deferred completion of projects.

Two main categories of 2025 program and project over-expenditures were identified:

- Planned work completed for a net higher cost than the original budget estimates; and
- Unanticipated refurbishment work to address findings of condition assessments, with expenditures exceeding the budget for such work.

The results of Hydro's analysis are summarized in Chart 2 and discussed in more detail herein.[8]

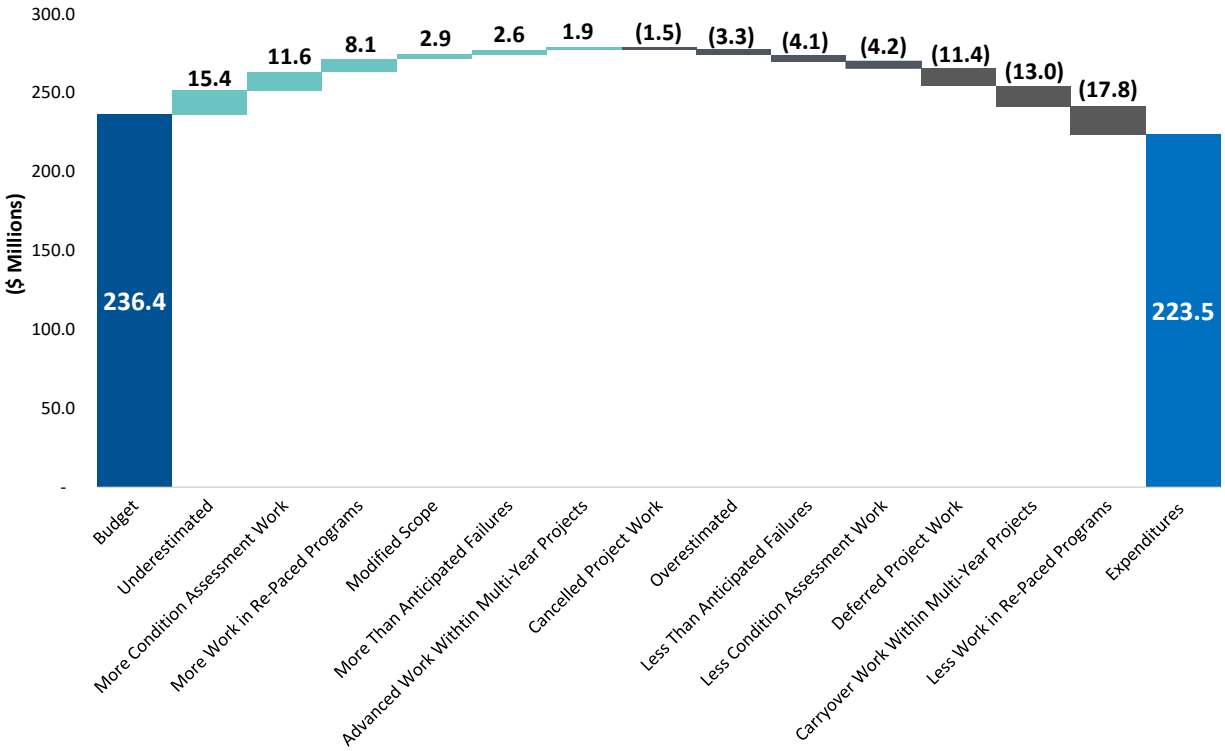


Chart 2: Analysis of 2025 Budget to Actual Capital Expenditures[9]

[8] Projects and programs with a material variance (at least $100,000 and 10%) are listed within their respective sections herein. Per the Provisional Guidelines, variance explanations for underspent projects and programs are not required; however, underspent projects and programs are listed and a brief description of the factors contributing to underspend are provided within this section.

[9] Numbers may not add due to rounding.

2.1 Re-Pacing of Programs

The pace of work within programs impacted Hydro's 2025 capital expenditures. As shown in Chart 2, programs with less work completed in 2025 compared to the budget estimate accounted for an under-expenditure of $17.8 million, while those with more work completed in 2025 accounted for an over-expenditure of $8.1 million. The net under-expenditure due to program re-pacing was therefore $9.7 million.[10] Three main drivers of the re-pacing of program work to future years have been identified as follows.

1) Design and Construction Resource Challenges: Some program scopes have carried over to 2026 as a result of scheduling challenges for design and construction resources, as well as supply chain-related challenges. The projects with material under-expenditures due to these challenges are:

- **a.** Replace Light- and Heavy-Duty Vehicles (2025–2027): Vehicle deliveries originally planned for 2025 were delayed to 2026, due to global supply chain challenges (e.g., availability and longer delivery time frames for vehicles).
- **b.** Overhaul Hydraulic Units (2025) – Bay d'Espoir: Some of the overhaul activities for Bay d'Espoir Unit 2 turbine and generator were carried over to 2026 due to scheduling challenges associated with required construction resources.
- **c.** Upgrade Power Transformers (2024–2025): Several scopes of work from this program were deferred to the Upgrade Power Transformers (2025–2026) program, primarily due to delayed delivery of materials and scheduling challenges associated with construction resources.
- **d.** Replace Mobile Equipment (2025–2027): Mobile equipment deliveries originally planned for 2025 were delayed to 2026, due to global supply chain challenges (e.g., availability and longer delivery timeframes for vehicles).

2) Unavailable Tools or Equipment: A portion of the work for one program carried over to 2026 due to the unavailability of the equipment required to complete the work:[11]

- **a.** Overhaul Turbine and Valves – Unit 3 (2025) – Holyrood.

[10] Numbers may not add due to rounding.
[11] Refer to the variance explanation in Section 4.0 for further information on this program.

3) Paused for Re-Assessment of the Scope, Budget, Required Timing, and/or Justification: The scope within one program had material under-expenditures related to a pause for re-assessment:

a. Upgrade Worst-Performing Distribution Feeders (2025–2027): Planned construction work was paused while a new customer service request was under review, which resulted in a change to the size of the conductor to be replaced as part of the program. Once the customer request was finalized, it was too late to complete the feeder upgrade in 2025. This work is now expected to be completed in 2026.

The decreased pacing of some programs in 2025 was partially offset by increased pacing on other programs. The programs with increased pacing that contributed materially to over-expenditures in 2025 are:[12]

- Replace Diesel Gensets (2024–2026);
- Overhaul Major Pumps (2025) – Holyrood;
- Wood Pole Line Management (2025); and
- Replace Light- and Heavy-Duty Vehicles (2023–2025).

2.2 Changes within Continuing Multi-Year Projects

Schedule changes are made to some multi-year projects often without affecting the project completion date, but impacting the annual cost flow. As shown in Chart 2, expenditures that are now expected to be incurred in future years within multi-year projects account for $13.0 million in 2025 under-expenditures, while costs advanced from future years into 2025 account for $1.9 million in over-expenditures. Therefore, changes within continuing multi-year projects resulted in a net under-expenditure of $11.1 million.[13]

Two main drivers of schedule changes within continuing multi-year projects resulting in under-expenditure have been identified.

1) Delayed Delivery of Materials: Some expenditures for material deliveries in multi-year projects have carried over to future years as a result of delays in delivery or revised design and

[12] Refer to the variance explanation in Section 4.0 for further information on these programs.
[13] Numbers may not add due to rounding.

fabrication schedules impacting the timing of payments. The projects with material under-expenditures are:

a. Purchase Spare Generator Step-Up Transformer (2023–2028): The vendor provided an updated design and fabrication schedule that has shifted progress payments from 2025 into future years, without impacting the expected delivery of the transformer in 2028.

b. Rewind Stator (2025–2026) – Hinds Lake: The vendor provided an updated design and fabrication schedule that has shifted progress payments from 2025 into 2026, without impacting the expected delivery of the new generator stator windings in 2026.

c. Refurbish Marine Terminal (2025–2026) – Holyrood: The lead time for materials for refurbishment of the jetty fender and side bumpers was longer than originally estimated, resulting in some of the planned 2025 construction carrying into the second year of the project.

d. Replace Igniter System (2025–2026) – Hardwoods and Stephenville: Material originally scheduled to be delivered in 2025 was received in January 2026, without impacting the expected project completion date.

2) Paused for Re-Assessment of the Scope, Budget, Required Timing, and/or Justification: When information becomes available during execution of a project that may materially impact the scope, budget, required timing or justification, Hydro will pause the project for further assessment. Such pauses have resulted in carryover of expenditures within some multi-year projects. One project had material 2025 under-expenditures of this nature:

a. Additions for Load Growth – Upgrade Transformer Capacity (2023–2028) – Jean Lake Terminal Station.[14]

[14] Refer to the variance explanation in Section 4.3.1.

3) Design and Procurement Challenges: The following project encountered significant challenges associated with the design or procurement that resulted in material carryover of expenditures from 2025 to 2026:

a. Replacement of Information Systems (2025–2026):[15] Gathering internal stakeholder requirements and the procurement process for this new software application took longer than originally anticipated, delaying the start of this project.

The projects with material impacts that were advanced from future years are as follows:

- Additions for Load Growth – Unit 2065 Replacement and Fuel Storage Upgrades (2024–2027) – Rigolet;[16] and
- Upgrade Work Protection Code Application (2025–2026).[17]

2.3 Deferred Project Scopes of Work

As shown in Chart 2, several projects planned for completion in 2025 have had activities carried over to 2026, resulting in 2025 under-expenditures of $11.4 million. Four main themes related to these deferrals were identified:

1) Design and Procurement Challenges: The following projects encountered significant challenges associated with design or procurement that resulted in a material carryover of expenditures from 2025 to 2026:

a. Upgrade Water and Fire Suppression Systems (2023–2024) – Bishop's Falls: During engineering design, challenges were experienced with sizing the new fire pump due to low flow rate and pressure values, which delayed sizing and procurement of the generator, load bank, and panel, leading to a late start to construction.

b. Perform Accessibility Improvements (2025): The scope of this supplemental project changed to include upgrades in different areas of the building than originally planned to address changing staff accessibility requirements. This, combined with the late receipt of detailed

[15] This supplemental project related to the replacement of two outdated software applications—Hydro's Learning Management System and Reporting Tools.
[16] Refer to the variance explanation in Section 4.3.2.
[17] Refer to Section 2.4.

design from the third-party architect, resulted in a carryover of a portion of the construction to 2026.

2) Delayed Delivery of Materials: The following projects encountered material carryover as a result of delayed material delivery:

a. Refurbish Control Structure (2021–2025) – Ebbegunbaeg: Replacement of the screw stem hoist systems for Gates 1 and 3 has been carried over to 2026 due to the delayed delivery of the new equipment.

b. Replace Interconnect Microwave Radios (2025): Installation of the new microwave radio communications equipment carried over into 2026 due to the delayed delivery of the new equipment from the vendor.

3) Work Paused to Reassess Justification or Re-Evaluate Alternatives: When information becomes available during execution of a project that may materially impact the project scope, budget, required timing, or justification, Hydro will pause the project for further assessment. Such pauses have resulted in carryover of expenditures within projects originally planned to be completed in 2025. Two projects had material 2025 under-expenditures of this nature:

a. Additions for Load – Wabush Substation Upgrades (2021–2025): Hydro paused this project in 2025 to review the budget and schedule due to recent project experience in Wabush that indicates significantly higher construction contract and materials costs than originally estimated.

b. Replace VHF Radio System (2024–2025): A review of alternative technology solutions resulted in a changed scope that delayed project progress. Installation of approximately half of the communications equipment has been carried over to 2026.

4) Longer than Expected Construction Duration: The following projects encountered material carryover as a result of longer than expected construction duration:

a. Replace Powerhouse 1 Roof (2024–2025) – Bay d'Espoir: The start of construction was delayed to investigate and mitigate electrical induction hazards associated with high voltage powerlines. Installation was substantially completed in 2025, but some sections of the new

roof system could not be installed in 2025 due to unfavourable weather and difficulty in securing the generation unit outages required for safe execution of the work.

b. Wabush Terminal Station Upgrades (2021–2024): Planned scope to install a new Transformer T4 was completed in 2025, but the associated work to remove and dispose of the old transformer carried over to 2026 due to longer-than-expected field activity.

2.4 Expenditure Variances from Estimates

As shown in Chart 2, capital program and project work completed in 2025 for more than the original budget estimates accounted for approximately $15.4 million of over-expenditure and work completed in 2025 for less than the original budget estimates accounted for $3.3 million in under-expenditure, for a net over-expenditure of $12.1 million associated with the estimates. The majority of these over-expenditures were for expenditures that were necessary for the successful completion of the project or program objectives but were not anticipated at the time of the original budget estimates. For example, additional expenditures were incurred for Overhaul Turbine and Valves – Unit 3 (2025) – Holyrood to expedite the unit reassembly and commissioning activities and return the unit to service as quickly as possible, to minimize risk to winter readiness.[18]

The programs and projects with material over-expenditures in this category are:[19]

- Overhaul Turbine and Valves – Unit 3 (2025) – Holyrood;
- Replace Metering System (2022–2024);
- Diesel Genset Replacement Program (2023–2025);
- Wabush Terminal Station Upgrades (2021–2024);
- Refurbish Surge Tank 1 (2024–2025); – Bay d'Espoir;
- Replace Protective Relays (2024–2025);
- Replace Annunciator - Phase 2 (2024–2025) – Bay d'Espoir;
- Perform Level 2 Condition Assessment – Intake 4 and Unit 7 Draft Tube (2025) – Bay d'Espoir;
- Upgrade Worst-Performing Distribution Feeders (2024–2025); and

[18] Refer to the variance explanation in Section 4.1.2 for further information.
[19] Refer to the variance explanation in Section 4.0 for further information on these programs.

- Install Breaker Failure Protection (2023–2024) – Sunnyside.

The programs and projects with material under-expenditures in this category are:

- Upgrade Work Protection Code Application (2025–2026): Originally planned for completion in 2026, the project was accelerated and completed in 2025 at a lower cost than originally estimated due to fewer customizations than expected and the accelerated schedule.
- Replace Diesel Gensets (2024–2026): The engineering, procurement, and construction costs for this program were less than originally estimated.

2.5 Work Required to Address Condition Assessments

Some programs and projects involve taking assets out-of-service for condition assessment to determine the extent of refurbishment required. For these programs and projects, budget estimates are typically based on historical expenditures and engineering judgment. In 2025, as shown in Chart 2, programs and projects of this nature with expenditures exceeding the budget allowances accounted for $11.6 million in over-expenditures, and those with expenditures less than estimated accounted for $4.2 million in under-expenditures. The net over-expenditure for programs and projects with refurbishment work to address findings of condition assessments was therefore $7.4 million.

As an example, inspection of the Holyrood Unit 3 turbine lower steam chest[20] within the Overhaul Turbine and Valves – Unit 3 (2025) – Holyrood program identified the requirement to remediate additional cracks,[21] a scope of work that was not anticipated at the time of budget estimate preparation.

The programs and projects in this category with material over-expenditures are:[22]

- Overhaul Turbine and Valves – Unit 3 (2025) – Holyrood;
- Perform Boiler Condition Assessment and Miscellaneous Upgrades (2025) – Holyrood; and
- Refurbish Control Structure (2021–2025) – Ebbegunbaeg.

[20] A turbine steam chest is a valve casing for the turbine control valves.
[21] The original planned scope of work included the remediation of one known crack in the lower steam chest, but additional cracks were discovered in 2025.
[22] Refer to the variance explanation in Section 4.0 for further information on these programs.

The programs and projects in this category with material under-expenditures are:

- Flatten Downstream Slope (2024–2025) – Hinds Lake: A portion of the downstream slope flattening was determined to be no longer required following the completion of geotechnical work and an engineering assessment.
- Penstock 1 Life Extension – Phase 1 (2023–2025): Hydro has reported on the under-expenditures relevant to the Penstock 1 Life Extension project in its Major Projects Monthly Project Updates.[23]

2.6 Modified Scopes of Work

Following approval of the Board, the scopes of work within projects and programs may be modified if new information or conditions impact the originally intended execution approach. As shown in Chart 2, capital programs and projects with modified scope accounted for approximately $2.9 million of over-expenditures. There were two programs with material impacts in 2025:[24]

- Upgrade Worst-Performing Distribution Feeders (2024–2025); and
- Renew Distribution Feeders (2024–2025).

2.7 Cancelled Scopes of Work

Following approval by the Board, projects and programs may be cancelled in whole or in part when new information or conditions impact the original scope justification. As shown in Chart 2, cancelled scopes of work resulted in approximately $1.5 million in 2025 under-expenditure. There was one program with a material scope cancellation in 2025:

- Renew Distribution Feeders (2024–2025).[25]

2.8 Work Required to Address In-Service Failures

In-Service Failures programs for various asset classifications have undefined scopes of work at the time of budget estimate preparation. Budget estimates for these programs are typically based on historical expenditures and engineering judgment. Hydro's annual capital budget also includes $1.0 million in the

[23] Please refer to Appendix B of "Bay d'Espoir Penstock 1 Life Extension Project Update," Newfoundland and Labrador Hydro, January 15, 2026.
[24] Refer to the variance explanation in Section 4.0 for further information on these programs.
[25] Refer to the variance explanation in Section 4.0 for further information on this program.

Allowance for Unforeseen Items Account as another mechanism to address in-service failures; this account was not utilized in 2025.

In 2025, as shown in Chart 2, programs addressing failures with expenditures in excess of estimates accounted for $2.6 million in over-expenditures, while those with expenditures less than estimates accounted for $4.1 million in under-expenditures. Therefore, the net under-expenditure for work to address in-service failures was $1.5 million.[26]

2.9 Cloud-Based Expenditures

In Order No. P.U. 35(2025), the Board approved the creation of a Cloud Cost Deferral Account effective January 1, 2025 ("Deferral Account"). The operating costs incurred in the implementation of cloud-based software solutions will be charged to the Deferral Account; specifically, the costs that would have been capitalized if the solution had been on-premises. The amount charged to this account will include up-front payments for implementation costs and other directly attributable costs for cloud-based solutions, and capitalized interest as calculated in accordance with Hydro's Capitalization Guidelines.

Hydro proposes IS projects through the regulatory CBA process, as Hydro does not typically know whether a solution for a proposed project will be a cloud-based or on-premises solution until the completion of the procurement process, at the earliest.[27] This process is necessary to facilitate Board approval of any potential capital expenditures in accordance with the *Act*. In terms of Board approval for the cloud-based projects listed herein, the Email Migration project was ongoing and known to be a cloud-based solution as of the date of amalgamation; therefore, Hydro applied separately to the Board for approval to include the implementation costs of this project in the Deferral Account. The other cloud-based projects listed herein are under $750,000 and were therefore approved internally by Hydro and reported to the Board in the Report on Amalgamation Activities.[28]

Each of the projects listed below incorporates a cloud-based software solution provided to Hydro as a subscription-based SaaS[29] model, whereby Hydro is provided access to the software in exchange for monthly user access or license payments throughout the contract term. The costs identified for each of

[26] Please refer to Section 4.1.1 for a detailed breakdown of the in-service failure capital projects.
[27] If a situation arises wherein a project is known to be a cloud-based solution in the planning stage in advance of procurement and is therefore not a capital project, Hydro will continue to follow the same or a similar process and seek Board approval prior to the deferral of any cloud-based implementation costs.
[28] "Report on Amalgamation Activities," Newfoundland and Labrador Hydro, rev. April 17, 2025 (originally filed April 15, 2025).
[29] Software as a Service ("SaaS").

the projects are the one-time operating costs associated with the implementation of these programs for Hydro's use. There are no monthly or annual license or subscription fees included in these implementation costs. The portion of these implementation costs that apply to serving Hydro's non-regulated lines of business will be recovered in accordance with Hydro's Intercompany Transactions Costing Guidelines as the Deferral Account is amortized.

In its Report on Amalgamation Activities, Hydro noted that it would provide the Board with information on cloud-based expenditures within its Capital Expenditures and Carryover Report; details on the projects in this category are included herein.

Email Migration[30]

Variance Type	Budget ($000)	Expenditures and Forecast ($000)	Variance ($000)
2025 Annual	305.5	1,857.9	1,552.4
Project	3,214.8	2,863.9	(356.9)

While the overall project estimate did not change, the actual spend timing during execution has differed. Hydro has spent $2.9 million as of the end of 2025, $1.0 million of which was incurred as operating costs in 2024. In Board Order No. P.U. 1(2026), the Board approved that the 2025 cloud-based implementation operating costs be transferred to the Cloud Cost Deferral Account.

Implement Document Control Software for Major Projects (2025)[31]

Variance Type	Budget ($000)	Expenditures and Forecast ($000)	Variance ($000)
Project	170.0	132.3	(37.7)

Migrate Legacy Applications (2025)

Hydro has legacy custom-built applications that require replacement due to supportability and compatibility issues with new technologies, as well as the potential for security risks. In 2025, Hydro

[30] As reported in "2025 Implementation Costs to the Cloud Cost Deferral Account", Newfoundland and Labrador Hydro, December 11, 2025, sch. 1.
[31] As reported in "2025 Implementation Costs to the Cloud Cost Deferral Account", Newfoundland and Labrador Hydro, December 11, 2025, sch. 2.

replaced several of its custom-built applications with newer standard and custom technology solutions through the Migrate Legacy Applications (2025) project, which included the Microsoft Power Apps and Emergency Response Application projects.[32] Portions of these scopes were cloud-based expenditures—$104,000 for Microsoft Power Apps and $23,800 for the Emergency Response Application in 2025. Total capital expenditures for the Migrate Legacy Applications (2025) project in 2025 are provided in Appendix A of this report.

3.0 Key Performance Indicators

As set out in the Provisional Guidelines,[33] this report includes a summary of KPIs for capital expenditures specific to projects and programs for the last ten years.

The KPIs for projects are:

- The number of projects planned and completed by Materiality Threshold;[34] and
- The original budget value of projects completed, and the final cost of projects completed by Materiality Threshold.[35]

The KPIs for programs are:

- The number of units planned and completed by Materiality Threshold; and
- The estimated average unit cost and actual average unit cost.

In 2023, Hydro began tracking its capital expenditures in a manner that allows reporting of these KPIs. KPI data is now available and presented herein for the three-year period from 2023 to 2025.[36]

[32] Microsoft Power Apps and Emergency Response Application projects were included within the Migrate Legacy Applications (2025) project as reported in Appendix A of the "Report on Amalgamation Activities," Newfoundland and Labrador Hydro, rev. April 17, 2025 (originally filed April 15, 2025).
[33] The Provisional Guidelines require the inclusion of ten years of data for each KPI. The Provisional Guidelines introduced a new definition for programs and, as Hydro did not track the required metrics for each indicator prior to the approval of the Provisional Guidelines, Hydro has provided this data beginning with 2023 and will continue to add data with each subsequent annual report.
[34] The Materiality Thresholds are defined in the Provisional Guidelines and are applied to the original total budget for each project or program. KPI data includes projects approved as part of annual CBAs and approved supplemental projects.
[35] Does not include projects continuing in 2026.
[36] As the existing IS assets currently in service as of January 1, 2025 will continue to be recorded in Hydro's non-regulated operating segment pending approval of Hydro's Existing IS Assets Application, they are not included within the KPI data presented herein. These projects and programs are outlined in Appendix C to this report.

3.1 Project Key Performance Indicators

3.1.1 Planned versus Completed Projects by Year and Materiality Threshold

In this section, Hydro has provided tabular and graphical representations, both in aggregate and for each Investment Classification, of the planned versus completed projects by Materiality Threshold.[37] Hydro completed[38] 52 of the 77 projects planned[39] for completion in 2025. The primary contributing factors for projects that were planned for completion but were not completed in 2025 were:

- Design and procurement challenges,
- Delayed delivery of materials,
- Longer-than-anticipated construction duration, and
- Resource scheduling challenges.

Hydro has assessed the risks associated with the delayed completion of these projects and, where necessary, has applied appropriate mitigations. As such, none of the projects carried over into 2026 represents a significant risk to the supply of electricity to customers.

[37] For this metric, a project is deemed complete when the full project scope is complete, all assets are in service, and the project is closed. For projects that have multiple assets planned to go into service, some assets may be in service when planned, while others may have been carried over. Of the 24 projects that carried over, 14 had some assets placed in service in 2025 or prior years, 4 of which were over 85% complete.
[38] Of the 77 planned projects, 1 project, the Webex Migration and Room Upgrades, was cancelled in 2025, as Hydro has moved to a different video conferencing tool.
[39] Does not include the 2025–2026 project that was completed early in 2025—Upgrade Work Protection Code Application (2025–2026).

Table 2: Planned vs. Completed Projects – Aggregate

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	Planned Projects	Completed Projects	Planned Projects	Completed Projects	Planned Projects	Completed Projects
2025	57	41	15	9	5	2
2024	37	24	12	8	5	3
2023	37	29	12	6	2	0

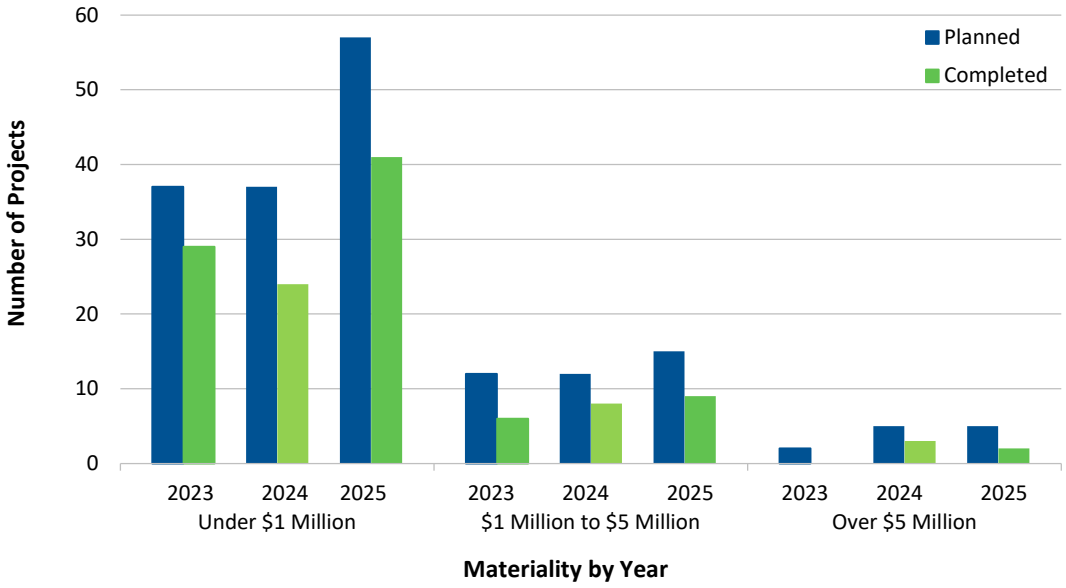


Chart 3: Planned vs. Completed Projects – Aggregate

Renewal

Table 3: Planned vs. Completed Projects – Renewal

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	Planned Projects	Completed Projects	Planned Projects	Completed Projects	Planned Projects	Completed Projects
2025	22	14	8	7	2	0
2024	14	7	6	3	1	1
2023	23	18	8	5	0	0

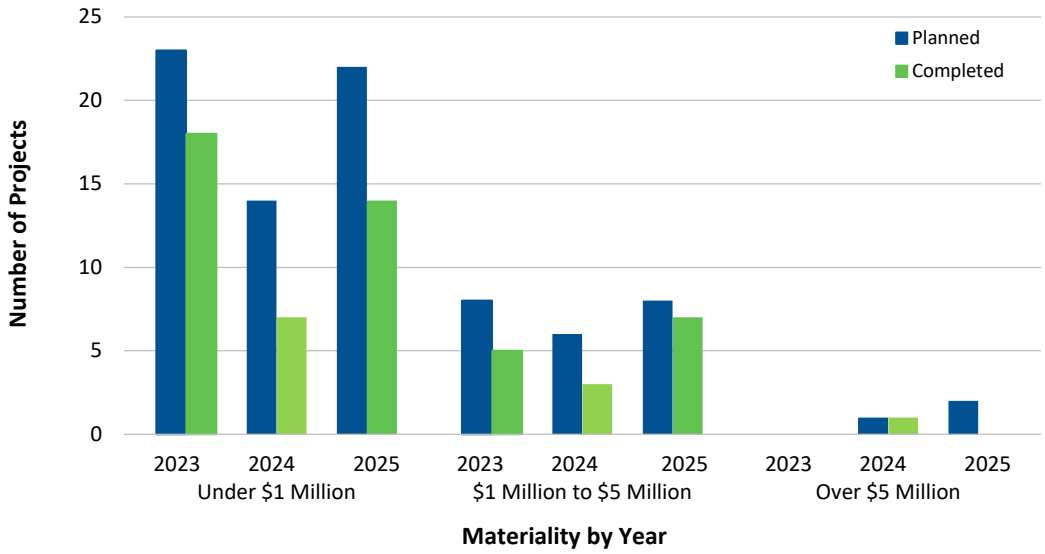


Chart 4: Planned vs. Completed Projects – Renewal

General Plant

Table 4: Planned vs. Completed Projects – General Plant

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	Planned Projects	Completed Projects	Planned Projects	Completed Projects	Planned Projects	Completed Projects
2025	27	20	7	2	0	0
2024	14	10	3	2	0	0
2023	5	5	2	1	0	0

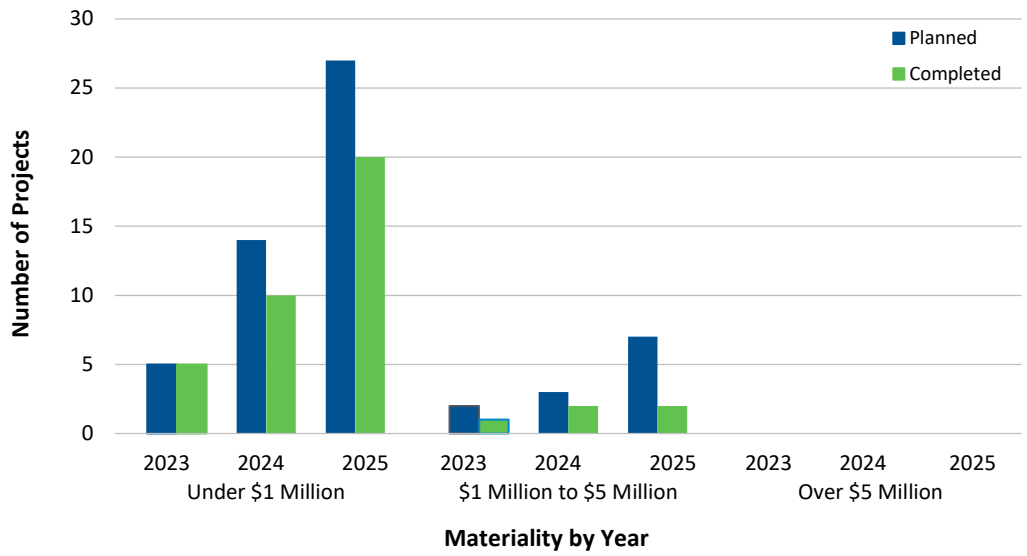


Chart 5: Planned vs. Completed Projects – General Plant

System Growth

Table 5: Planned vs. Completed Projects – System Growth

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	Planned Projects	Completed Projects	Planned Projects	Completed Projects	Planned Projects	Completed Projects
2025	2	2	0	0	2	1[40]
2024	1	0	0	0	1	0
2023	1	0	0	0	0	0

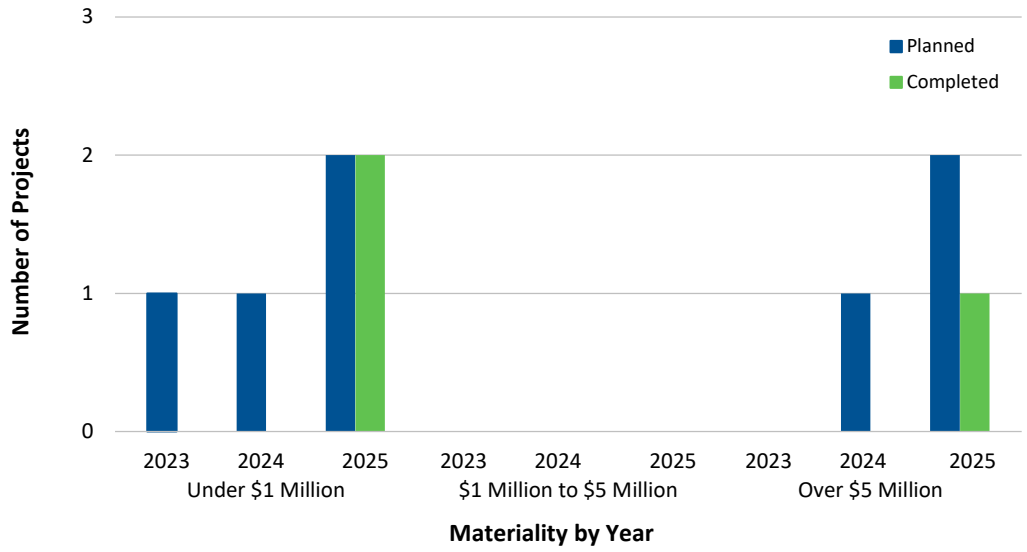


Chart 6: Planned vs. Completed Projects – System Growth

[40] Hydro considers the Additions for Load - Wabush Substation Upgrades (2021–2025) project partially complete, as assets have been placed in service.

Access

Table 6: Planned vs. Completed Projects – Access

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	Planned Projects	Completed Projects	Planned Projects	Completed Projects	Planned Projects	Completed Projects
2025	0	0	0	0	0	0
2024	0	0	0	0	1	1
2023	1	1	0	0	1	0

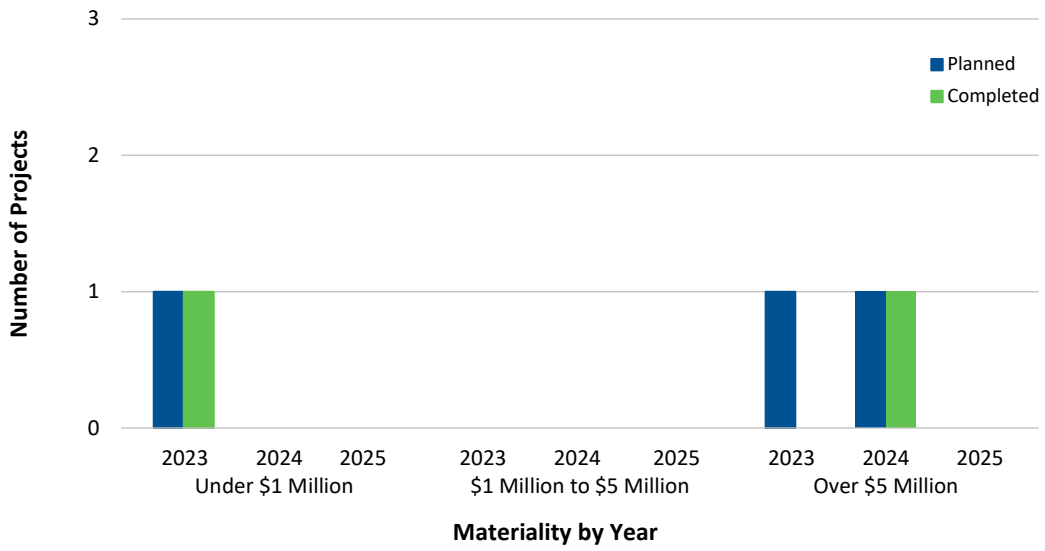


Chart 7: Planned vs. Completed Projects – Access

Service Enhancements

Table 7: Planned vs. Completed Projects – Service Enhancements

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	Planned Projects	Completed Projects	Planned Projects	Completed Projects	Planned Projects	Completed Projects
2025	3	2	0	0	1	1
2024	7	7	2	2	2	1
2023	7	5	2	0	1	0

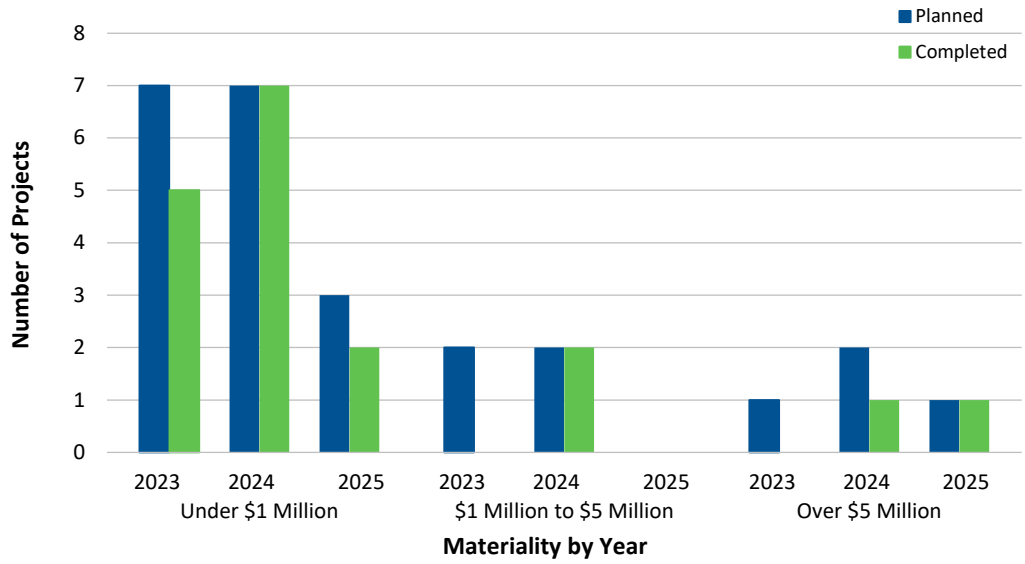


Chart 8: Planned vs. Completed Projects – Service Enhancements

Mandatory

Table 8: Planned vs. Completed Projects – Mandatory

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	Planned Projects	Completed Projects	Planned Projects	Completed Projects	Planned Projects	Completed Projects
2025	3	3	0	0	0	0
2024	1	0	1	1	0	0
2023	0	0	0	0	0	0

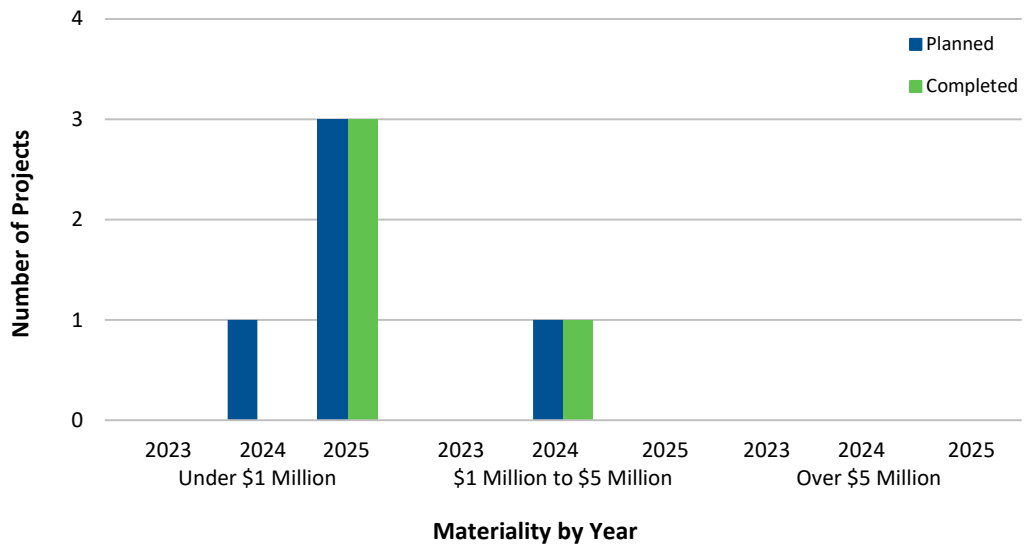


Chart 9: Planned vs. Completed Projects – Mandatory

3.1.2 Budget versus Expenditures by Year and Materiality Threshold

In this section, Hydro has provided tabular and graphical representations, both in aggregate and for each Investment Classification, of the planned budget versus expenditures for completed projects by Materiality Threshold. The expenditures for projects in these tables include total expenditures across all years of the projects. Major drivers of project variances are provided in Section 2; a detailed discussion of variances exceeding $100,000 and 10% are provided in Section 4.0.

Table 9: Budget vs. Expenditures – Completed Projects – Aggregate ($000)[41]

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	**Budget**	**Expenditures**	**Budget**	**Expenditures**	**Budget**	**Expenditures**
2025	17,629	22,478	18,180	16,524	16,570	18,291
2024	10,384	10,877	13,962	19,146	29,631	27,937
2023	9,406	10,470	12,816	17,834	0	0

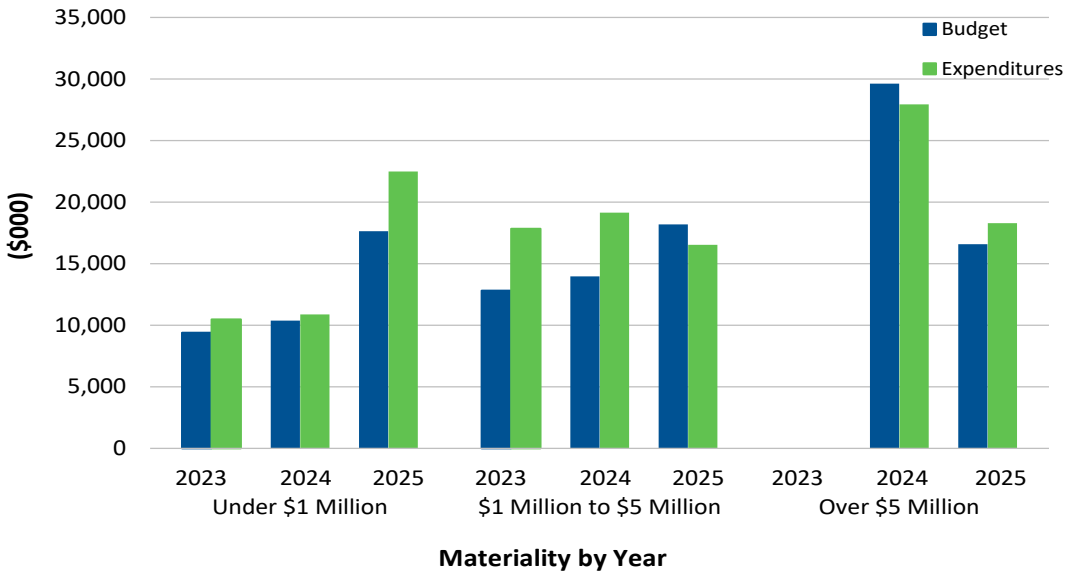


Chart 10: Budget vs. Actual Expenditures – Completed Projects – Aggregate

[41] Numbers may not add due to rounding.

Renewal

Table 10: Budget vs. Expenditures – Completed Projects – Renewal

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	**Budget**	**Expenditures**	**Budget**	**Expenditures**	**Budget**	**Expenditures**
2025	6,506	10,606	15,530	13,807	0	0
2024	3,267	3,029	5,738	9,411	6,409	6,673
2023	6,875	7,480	11,680	16,349	0	0

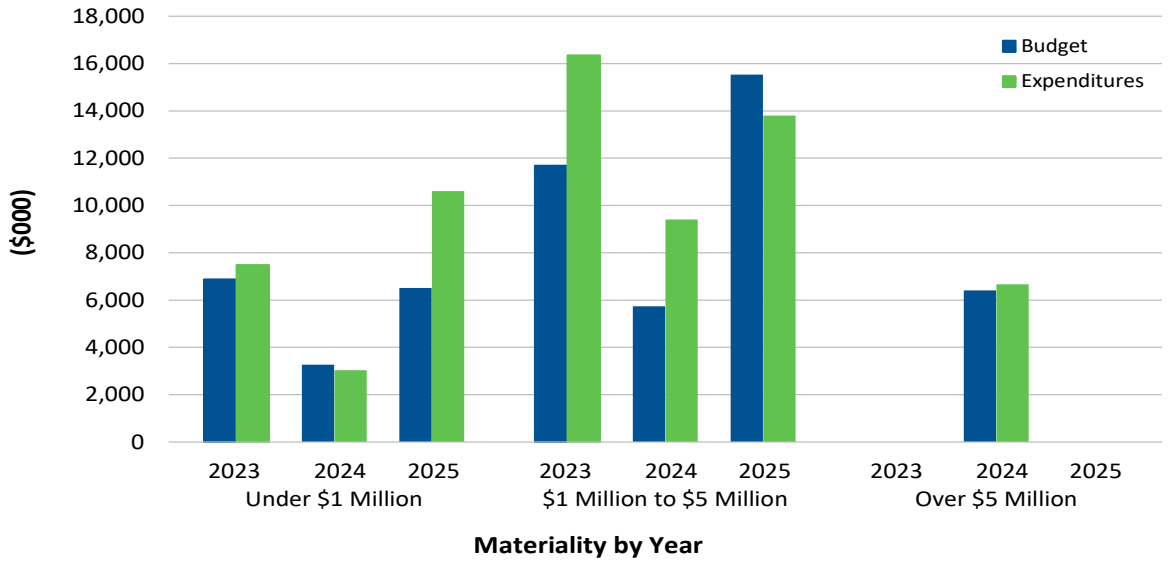


Chart 11: Budget vs. Actual Expenditures – Completed Projects – Renewal

General Plant

Table 11: Budget vs. Expenditures – Completed Projects – General Plant

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	Budget	Expenditures	Budget	Expenditures	Budget	Expenditures
2025	7,773	7,933	2,649	2,717	0	0
2024	4,866	5,245	3,060	4,282	0	0
2023	857	1,166	1,136	1,485	0	0

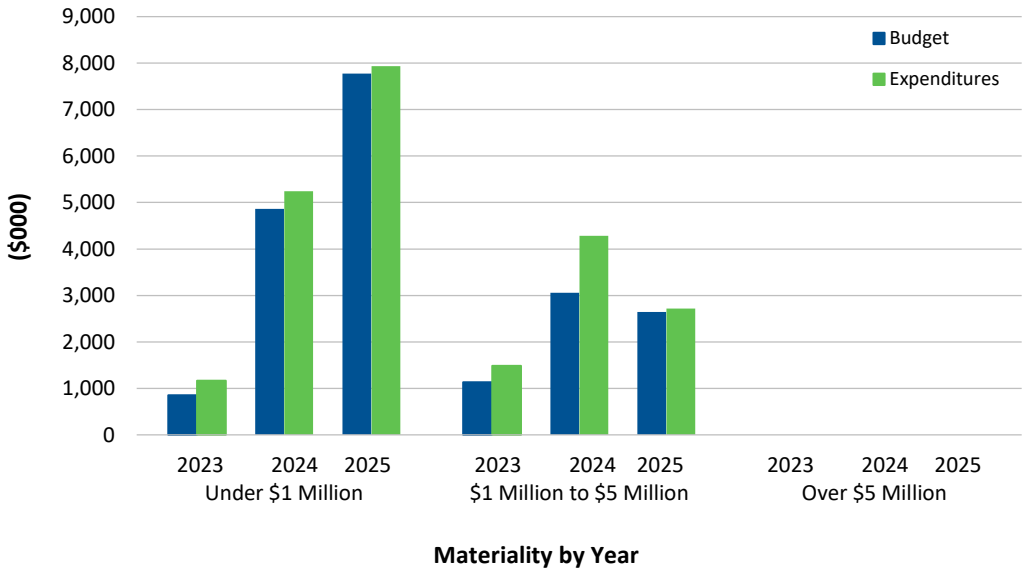


Chart 12: Budget vs. Actual Expenditures – Completed Projects – General Plant

System Growth

Table 12: Budget vs. Expenditures – Completed Projects – System Growth

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	**Budget**	**Expenditures**	**Budget**	**Expenditures**	**Budget**	**Expenditures**
2025	712	667	0	0	10,694	8,995
2024	0	0	0	0	0	0
2023	0	0	0	0	0	0

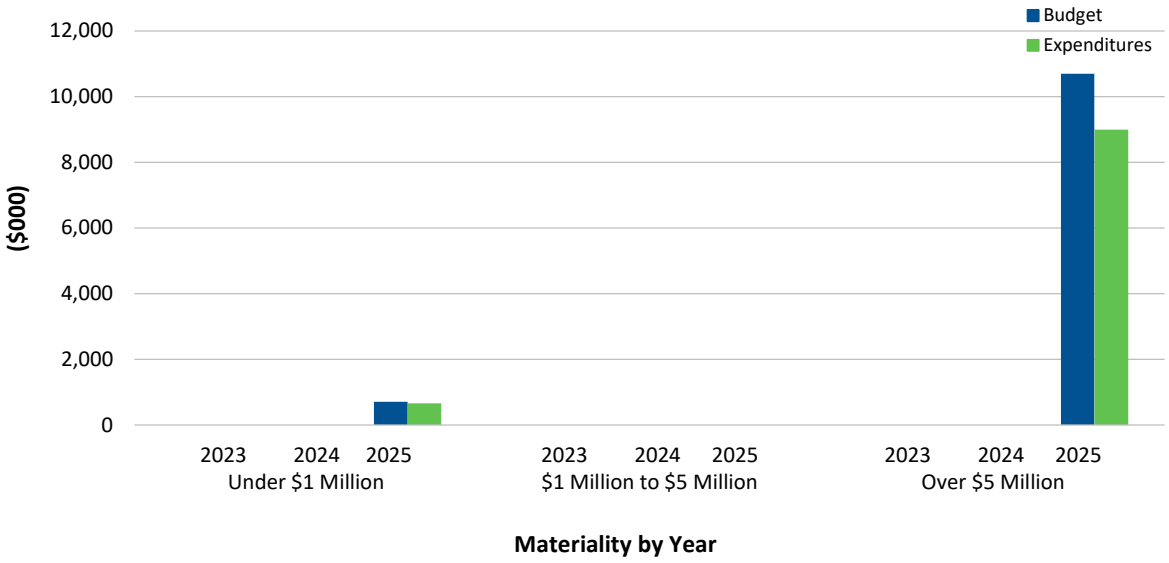


Chart 13: Budget vs. Actual Expenditures – Completed Projects – System Growth

Access

Table 13: Budget vs. Expenditures – Completed Projects – Access

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	Budget	Expenditures	Budget	Expenditures	Budget	Expenditures
2025	0	0	0	0	0	0
2024	0	0	0	0	16,347	16,149
2023	227	203	0	0	0	0

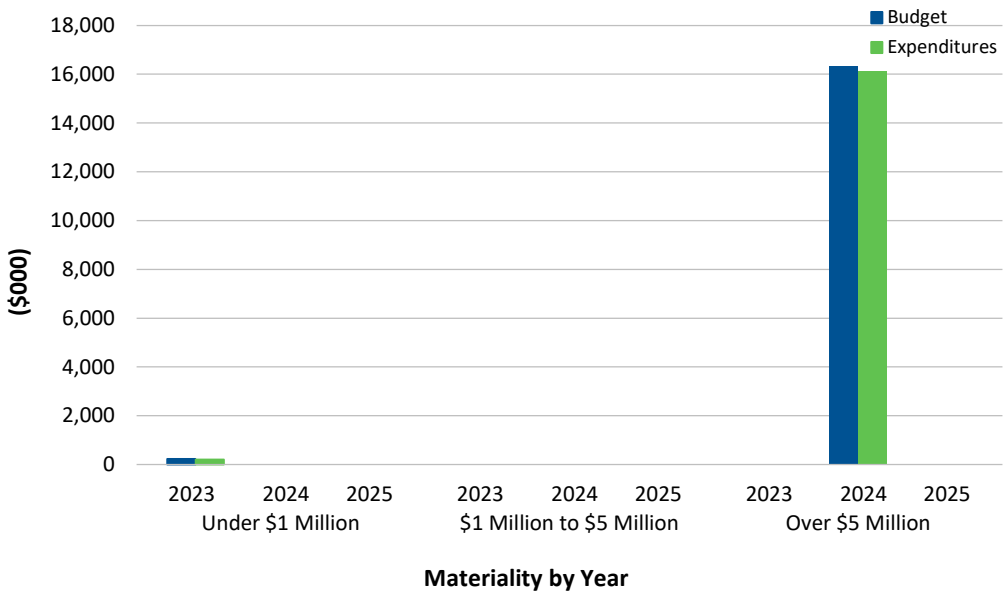


Chart 14: Budgets vs. Actual Expenditures – Completed Projects – Access

Service Enhancements

Table 14: Budget vs. Expenditures – Completed Projects – Service Enhancements

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	**Budget**	**Expenditures**	**Budget**	**Expenditures**	**Budget**	**Expenditures**
2025	592	584	0	0	5,876	9,295
2024	2,250	2,602	3,244	3,302	6,875	5,116
2023	1,448	1,620	0	0	0	0

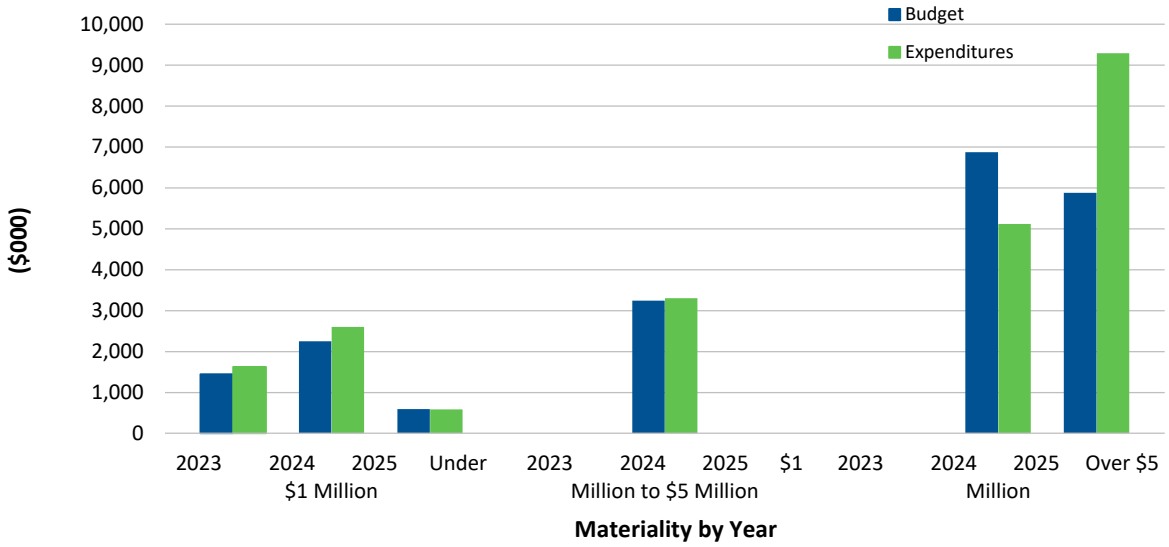


Chart 15: Budget vs. Actual Expenditures – Completed Projects – Service Enhancements

Mandatory

Table 15: Budget vs. Expenditures – Completed Projects – Mandatory

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	**Budget**	**Expenditures**	**Budget**	**Expenditures**	**Budget**	**Expenditures**
2025	2,046	2,688	0	0	0	0
2024	0	0	1,920	2,151	0	0
2023	0	0	0	0	0	0

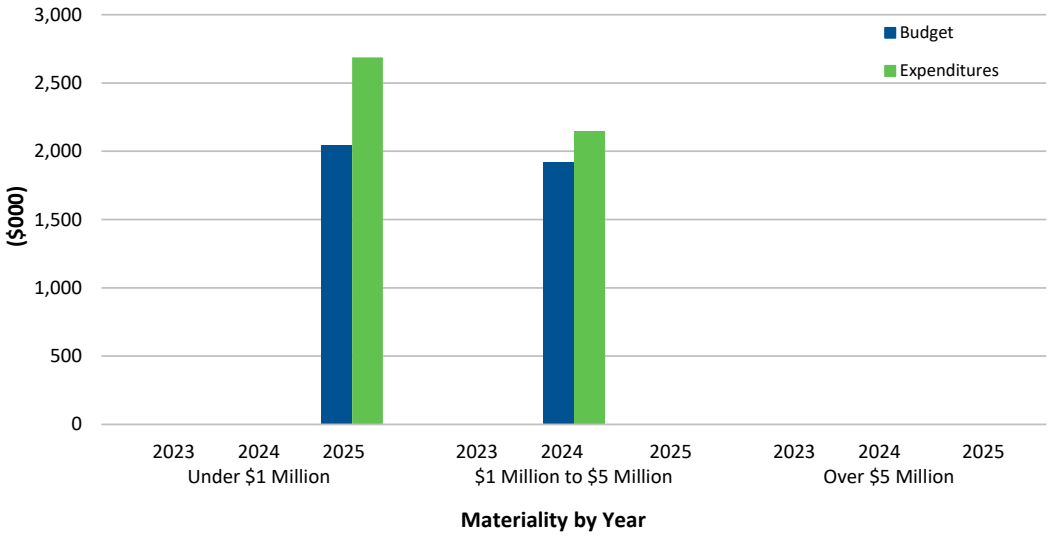


Chart 16: Budget vs. Actual Expenditures – Completed Projects – Mandatory

3.2 Program Key Performance Indicators

Planned versus completed units and budget versus actual weighted average unit costs for programs in 2025 are presented in Sections 3.2.1 and 3.2.2 respectively.[42] Some programs do not lend themselves to unitization,[43] despite otherwise meeting the definition of a program; therefore, they are excluded from the program KPIs herein. These programs are:

- Perform Software Upgrades and Minor Enhancements (2025);

[42] Hydro notes that KPI data is presented for programs beginning in 2023, and is not available for programs that were proposed prior to the implementation of the Provisional Guidelines.
[43] Programs that do not lend themselves to unitization include those with undefined scopes, scopes that change materially year to year, or scopes that are not made up of discrete components.

- Perform Minor Telecommunications Enhancements (2025);
- Upgrade Core OT Infrastructure (2025);
- Update Cyber Security Infrastructure (2025);
- Upgrade Energy Management System (2025–2026);
- Overhaul Turbine and Valves – Unit 3 (2025) – Holyrood;
- Diesel In-Service Failures (2025);
- Gas Turbine In-Service Failures (2025);
- Transmission In-Service Failures (2025);
- Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights (2025);
- Perform Boiler Condition Assessment and Miscellaneous Upgrades (2025) – Holyrood;
- Purchase Tools and Equipment (2025);
- Modify Office Buildings and Procure Furniture, Fixtures and Equipment (2025);
- Wood Pole Line Management (2025);
- Thermal In-Service Failures (2025);
- Hydraulic In-Service Failures (2025);
- Telecommunications In-Service Failures (2025);
- Terminal Station In-Service Failures (2025);
- Provide Service Extensions (2025);[44]
- Perform Major Inspection – Synchronous Condenser 2 (2025–2026) – Wabush;
- Remove Safety Hazards (2025); and
- Upgrade Worst-Performing Distribution Feeders (2025–2027).

[44] Hydro began to provide an estimated unit cost per new service request completed beginning in its 2026 CBA; as such, unit costs for this program will be provided in its 2026 Capital Expenditures & Carryover Report.

The following programs had no assets planned for completion in 2025, and therefore are also excluded from Sections 3.2.1 and 3.2.2:

- Renew Circuit Breakers (2025–2026);
- Replace Protective Relays (2025–2026)
- Upgrade Power Transformers (2025–2026);
- Replace Instrument Transformers (2025–2026);
- Replace Disconnects (2025–2026);
- Purchase Meters and Metering Equipment (2025-2026)
- Replace Diesel Gensets (2024–2026);
- Replace Diesel Gensets (2025–2027); and
- Replace Terminal Station Battery Banks and Chargers (2025–2026).

In total, Hydro completed the installation or refurbishment of 585 units, compared to 640 planned units in 2025. The reduction in units completed is primarily attributed to the delayed delivery of new mobile equipment and light- and heavy-duty vehicles.

3.2.1 Planned versus Completed Units by Year and Materiality Threshold

In this section, Hydro will provide tabular and graphical representations, both in aggregate and for each Investment Classification, of the planned number of units versus the actual number of units completed by year and Materiality Threshold.

Hydro began tracking its capital expenditures in a manner that allows reporting of these KPIs in 2023. KPI data is now available and presented herein for the three-year period, from 2023 to 2025, unless otherwise noted.

Table 16: Planned vs. Completed Program Units – Aggregate

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	Planned Units	Completed Units	Planned Units	Completed Units	Planned Units	Completed Units
2023	341	450	53	53	0	0
2024[45]	1810	1988	68	96	0	0
2025	474	500	114	75	52	10

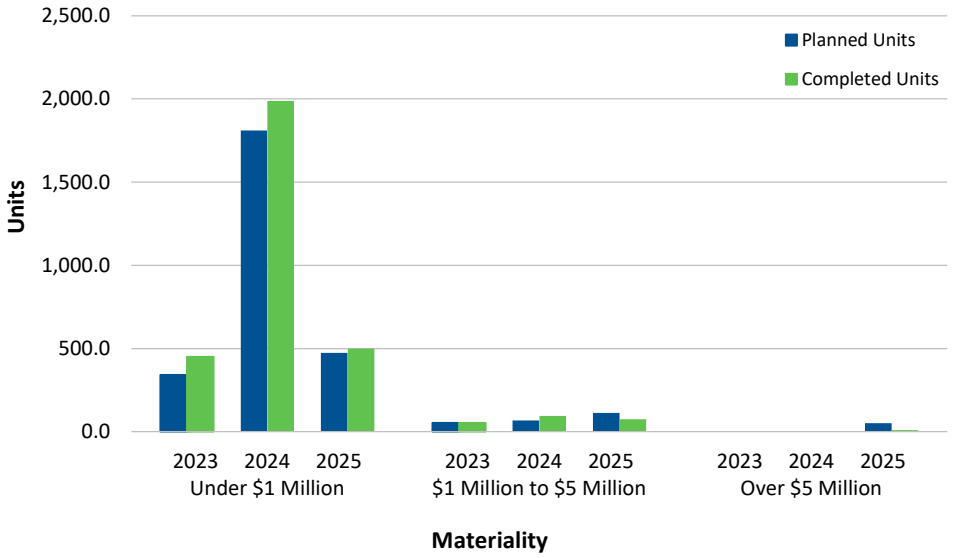


Chart 17: Planned vs. Completed Program Units – Aggregate

[45] The greater quantity of planned and completed units in 2024 is primarily attributed to the Purchase Meters and Metering Equipment (2024) program, which included 1,392 meters.

Renewal

Table 17: Planned vs. Completed Program Units – Renewal

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	Planned Units	Completed Units	Planned Units	Completed Units	Planned Units	Completed Units
2023	31	34	14	15	0	0
2024	165	305	36	53	0	0
2025	16	10	66	65	0	0

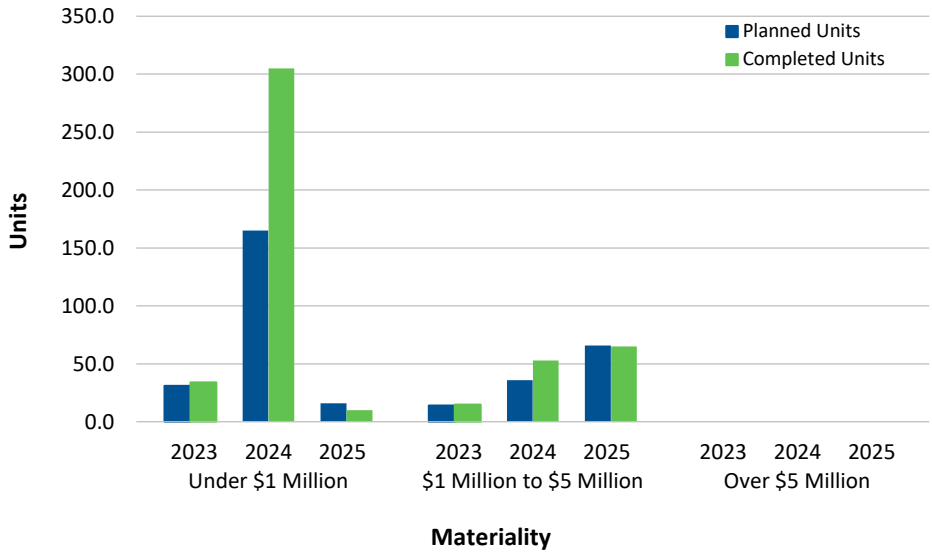


Chart 18: Planned vs. Completed Program Units – Renewal

General Plant

Table 18: Planned vs. Completed Program Units – General Plant

	Under $1 Million		$1 Million to $5 Million		Over $5 Million	
Year	Planned Units	Completed Units	Planned Units	Completed Units	Planned Units	Completed Units
2023	310	416	39	38	0	0
2024	253	291	32	43	0	0
2025	458	490	48	10	52	10

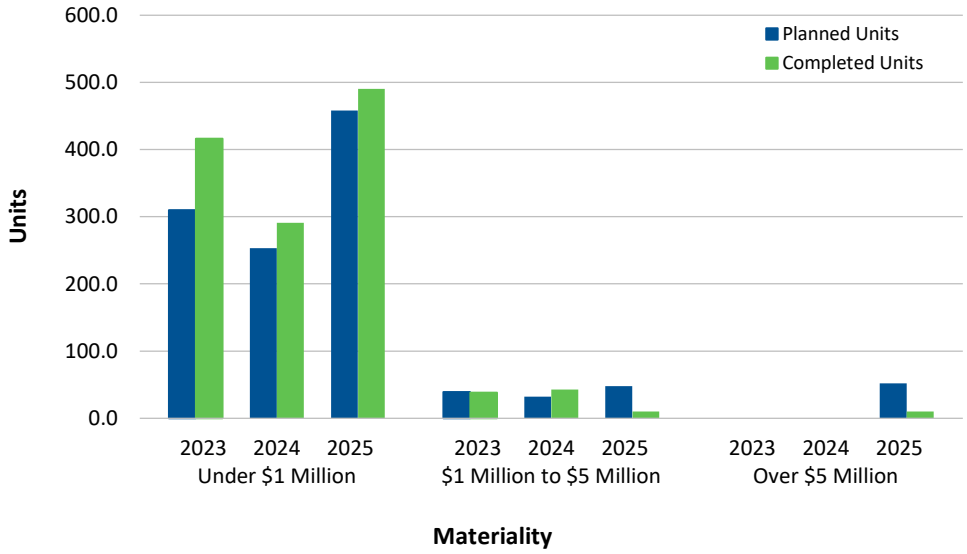


Chart 19: Planned vs. Completed Program Units – General Plant

3.2.2 Estimated versus Actual Weighted Average Unit Cost

In this section, Hydro will provide tabular and graphical representations, both in aggregate and for each Investment Classification, of the estimated weighted average unit cost versus the actual weighted average unit cost by year.

Hydro began tracking its capital expenditures in a manner that allows reporting of these KPIs in 2023. KPI data is now available and presented herein for the three-year period, from 2023 to 2025, unless otherwise noted.

Table 19: Estimated vs. Actual Weighted Average Unit Cost – Aggregate ($000)

Year	Estimated Weighted Average Unit Cost	Actual Weighted Average Unit Cost
2023	24.1	21.0
2024	15.7	11.2
2025	78.4	53.2

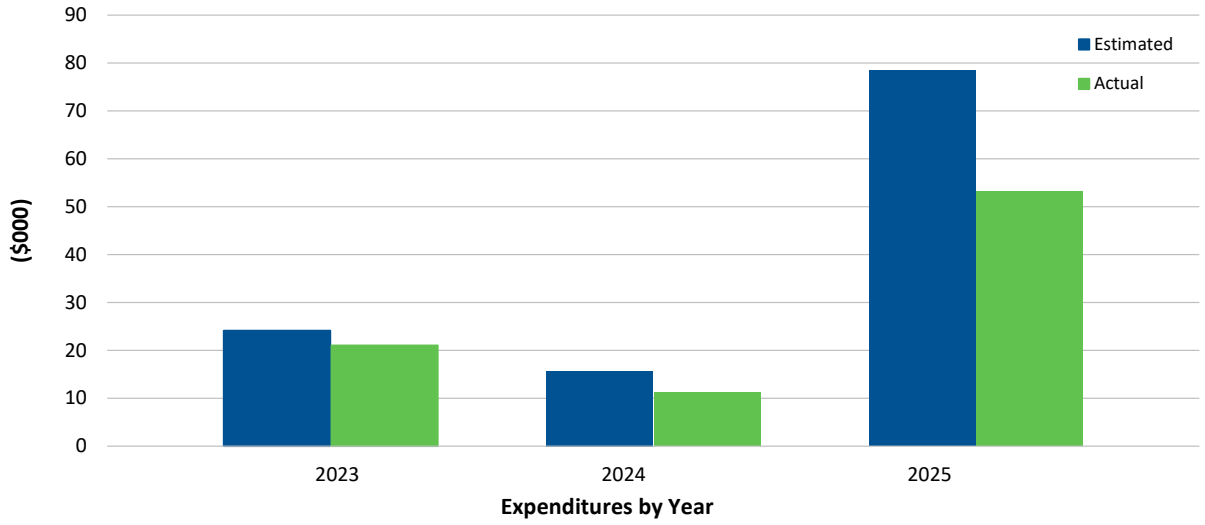


Chart 20: Estimated vs. Actual Weighted Average Unit Cost – Aggregate

Renewal

Table 20: Estimated vs. Actual Weighted Average Unit Cost – Renewal ($000)

Year	Estimated Weighted Average Unit Cost	Actual Weighted Average Unit Cost
2023	123.3	134.5
2024	116.5	50.6[46]
2025	381.5	313.6

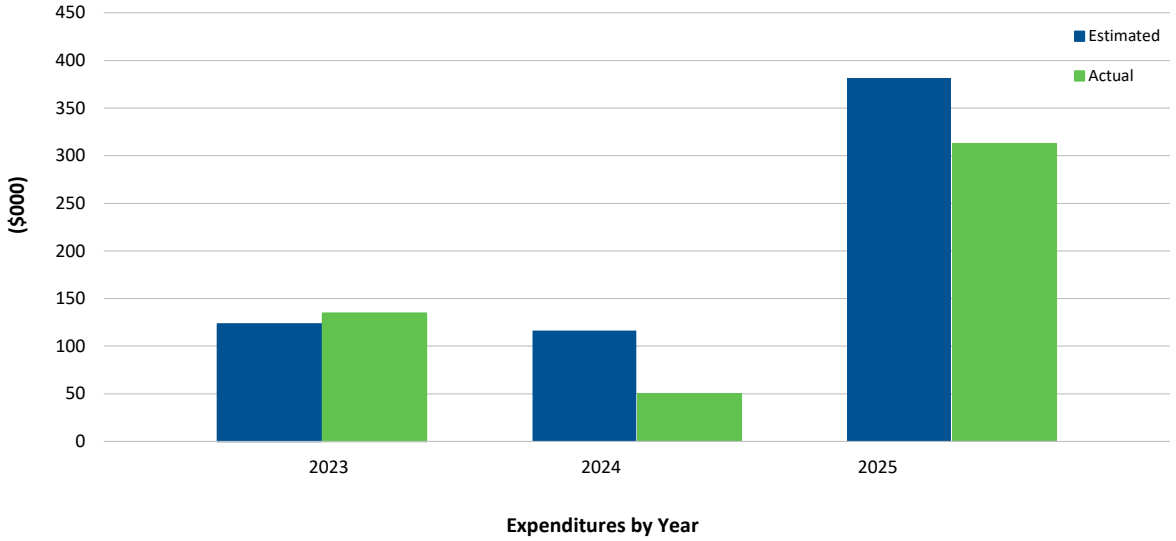


Chart 21: Estimated vs. Actual Weighted Average Unit Cost – Renewal

[46] Low actual unit cost in 2024 is primarily related to mobile devices, which were incorrectly categorized as Renewal in 2024 CBA. Mobile Devices are categorized as General Plant in 2025 CBA and beyond.

General Plant

Table 21: Estimated vs. Actual Weighted Average Unit Cost – General Plant ($000)

Year	Estimated Weighted Average Unit Cost	Actual Weighted Average Unit Cost
2023	11.4	8.7
2024	19.7	14.1
2025	33.9	14.8[47]

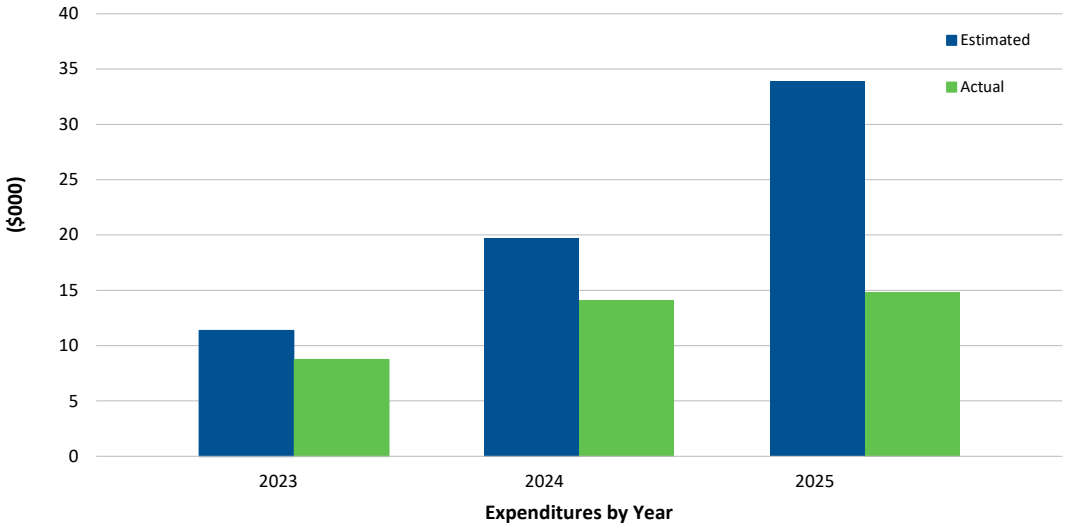


Chart 22: Estimated vs. Actual Weighted Average Unit Cost – General Plant

4.0 Variance Explanations

As per the Provisional Guidelines set forth by the Board, Hydro is required to report on actual capital expenditure variances that exceed the approved total program or project budget by more than 10% and $100,000. Hydro has also included variance explanations for programs or projects continuing beyond 2025 with forecasted variances exceeding the threshold, and for 2025 programs or projects where expenditures exceeded the approved 2025 budget by more than 10% and $100,000. For multi-year projects and programs, annual and overall variances are reported.[48] For programs and projects ongoing in 2025 that were budgeted to be under $750,000, Hydro has included variance explanations if the

[47] Low actual weighted average unit cost is primarily attributed to the low actual unit quantity of new mobile equipment and light- and heavy-duty vehicles received due to their delayed delivery.
[48] In cases where actual expenditures of only one of the annual and overall project/program budgets meets the reporting thresholds (exceeding the budget by 10% and 100,000), only the applicable variance includes an explanation.

expenditures and forecast exceed $750,000. Explanations are also provided for projects and programs for which Hydro has cancelled or significantly reduced the scope of work, or has modified the scope to an alternative solution. The programs and projects are ordered in the sections below based on investment classification and Materiality Thresholds, then alphabetically.

4.1 Renewal

4.1.1 In-Service Failures (2025)[49]

Program	Budget ($000)	Expenditures ($000)	Variance ($000)
Gas Turbine	500.0	1,868.2	1,368.2
Hydraulic	2,000.0	2,723.2	723.2
Thermal	3,900.0	3,058.7	(841.3)
Diesel	800.0	758.4	(41.6)
Terminal Station	2,500.0	516.0	(1,984.0)
Telecommunications[50]	94.1	77.0	(17.1)
Distribution[51]	6,397.0	5,624.9	(772.1)
Transmission	184.3	162.3	(22.0)
Total[52]	**16,375.4**	**14,788.7**	**(1,586.7)**

In-Service Failures are one-year programs (2025) that closed in 2025. The scope of work for these annual programs includes the refurbishment or replacement of assets due to the occurrence of actual failures, the identification of incipient failures, or the determination of faster-than-anticipated equipment deterioration for Hydro's assets; it also includes the procurement of capital spares required to support such work.[53] Budget estimates for In-Service Failure programs are based on historical averages, along with Hydro's experience and engineering judgment. As many of these programs have been introduced in recent years and have limited historical data, Hydro expects that it may take several years of

[49] While some individual In-Service Failure programs did not meet the threshold for reportable variance, all 2025 In-Service Failures programs are listed herein for completeness.
[50] The Telecommunications In-Service Failure program is classified as General Plant in Hydro's 2025 CBA; however, it is presented in the Renewal In-Service Failures (2025) section of this report for completeness.
[51] The budget for Distribution In-Service Failures, Miscellaneous Upgrades, and Street Lights (2025) included $1,042,442 for the purchase of a new capital spare substation power transformer. The ordering of this transformer has been delayed to 2026, as there have been technical challenges in the selection of a transformer that can serve as a spare for multiple locations across Hydro's system.
[52] Numbers may not add due to rounding.
[53] The Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights program includes distribution system upgrades and the installation of LED streetlights in addition to in-service failures.

implementation to determine an appropriate baseline estimate for annual in-service failure expenditures.

The variance in 2025 expenditures for each asset group is attributed to the scope of work required to address in-service failures in 2025 that require expenditures higher or lower than the budgeted allowance. Further details on material expenditures for In-Service Failure programs are provided in Appendix B.

4.1.2 Approved Budgets Over $5 Million

Hydraulic Generation Refurbishment and Modernization (2022–2023)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Program	6,759.5	7,768.1	1,008.6

This two-year program (2022–2023) carried over and was completed in 2025. The program scope included the replacement or refurbishment of failing or failed assets at hydraulic generating facilities, and included sub-programs for generating units, hydraulic structures, reservoirs, site buildings and services, and common auxiliary systems. All sub-programs[54] were closed in 2023, with the exception of the draft tube deck substructure Level 2 Condition Assessment for Powerhouse 1 at the Bay d'Espoir Hydroelectric Generating Facility ("Bay d'Espoir"), within the site buildings and services sub-program.

The variance in overall program expenditures is primarily attributed to the draft tube deck substructure condition assessment. There were additional construction expenditures associated with a requirement to schedule the in-water inspections in stages, necessitated by unforeseen challenges in taking the Bay d'Espoir generating units offline to allow for the safe completion of inspection work. In 2022, the work was impacted by a forest fire in Central Newfoundland that resulted in the closure of the Bay d'Espoir Highway (Route 360). Standby costs were incurred as construction resources responsible for the underwater portion of the inspection were unable to travel to the project site, and resources already mobilized to site were stranded in the Bay d'Espoir area until the highway reopened. The generation outages necessary to complete the underwater portion of the inspection could not be rescheduled

[54] The Hydraulic Generation Refurbishment and Modernization scope was classified by Hydro as a program prior to the implementation of the Provisional Guidelines. The draft tube deck substructure Level 2 Condition Assessment completed in 2025 better fits the Provisional Guidelines definition of a project, and is therefore classified as such in Section 3.0 of this report.

within 2022, 2023, or 2024[55] due to unplanned outages on the Island Interconnected System. Hydro completed in-water inspections of the draft tube deck substructure for Units 1 to 4 in 2025 and will use these results to form assumptions on the condition of Units 5 and 6.

The variance is also associated with the additional refurbishment work required for the overhaul of Bay d'Espoir Unit 6, completed in 2022. More refurbishment work was required for the turbine runner and various components of the generator rotor than was anticipated at the time of budget estimate preparation.

Overhaul Turbine and Valves – Unit 3 (2025) – Holyrood

Variance Type	Budget ($000)	Expenditures and Forecast ($000)	Variance ($000)
Annual	15,975.9	19,795.8	3,819.9
Program	15,975.9	23,362.0	7,386.1

This one-year program (2025) has carried over into 2026. This annual program is for scheduled overhauls for the three generating unit turbines on a nine-year cycle, the turbine valves on a three-year cycle, and the generators on a six-year cycle. The scope of work for the 2025 program includes the overhaul of the turbine and turbine valves for Unit 3,[56] including the remediation of a crack in the lower steam chest[57] of the turbine.

The inspection and overhaul of the turbine and turbine valves and the remediation of the lower steam chest were substantially completed in 2025. During the project discovery phase, damage was discovered on a turbine rotor diaphragm that required additional time to refurbish at the original equipment manufacturer's ("OEM") facility. The diaphragm refurbishment work was completed, but this unplanned refurbishment delayed the expected return to service of Unit 3. Failure of the turbine hall overhead crane at the Holyrood TGS, which is required to reassemble the turbine, further delayed the expected

[55] In 2024, the inspection contractor was mobilized to site, but the required generation outages for this underwater inspection could not proceed due to an unanticipated delay in the return to service of Bay d'Espoir Unit 7 and the Unit 3 Synchronous Condenser at the Holyrood Thermal Generating Station ("Holyrood TGS"), resulting in further mobilization, standby, and demobilization contract costs.
[56] The Unit 3 generator overhaul is not due to be performed until 2027 and is therefore not included in the 2025 program scope.
[57] A turbine steam chest is a valve casing for the turbine control valves.

return to service of the unit to the first quarter of 2026. Unit 3 returned to service on February 14, 2026, upon completion of the major overhaul of the steam turbine and valves.

The variance in 2025 expenditures and the forecasted variance in overall program expenditures are primarily attributed to the unforeseen additional refurbishment scope. The original program budget was based on historical turbine and valve overhaul expenditures. The full extent of refurbishment work can only be determined after the unit is removed from service and disassembled for inspection during program execution. In this case, the extent of the required refurbishment was greater than originally estimated. The following additional refurbishment work was identified and completed in 2025:

- High-pressure and intermediate-pressure turbine casing refurbishment, including the replacement of the turbine casing studs;
- Remediation of additional cracks discovered in the turbine lower steam chest; and
- Turbine rotor diaphragm, governor, and control valve refurbishment at the OEM's facility.

The variance in 2025 expenditures and forecasted variance in overall program expenditures are also attributed to additional expenditures to expedite unit reassembly and commissioning to return Unit 3 to service as quickly as possible. The additional refurbishment work described herein, combined with the turbine hall overhead crane being out of service for approximately seven weeks, resulted in the program work extending beyond the start of the winter readiness period. To minimize impact on winter readiness, Hydro implemented a second shift (night crew) starting in mid-November 2025, resulting in additional contract and internal labour expenditures. There are no viable alternatives for this program, and Hydro proceeded with execution.

Overhaul Unit 1 Turbine Valves and Generator (2024) – Holyrood

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Program	5,181.4	11,722.3	6,540.9

This one-year program (2024) carried over and was completed in 2025. The scope of work for the 2025 program included the overhaul of the Holyrood Unit 1 turbine valves and generator.

The variance in overall program expenditures is attributed to the unanticipated additional scope required to refurbish the turbine. The original program budget was based on historical turbine valve and

generator overhaul expenditures. The full extent of refurbishment work can only be determined after the unit is removed from service and disassembled for inspection during program execution. In this case, significant additional refurbishment was required.

As part of the supplemental Replace Unit 1 and 2 Last Stage Turbine Blades – Holyrood project,[58] the turbine rotor was removed and sent to the OEM facility to replace the last stage turbine blades. While at the facility, inspection revealed extensive damage on the rotor diaphragms and bearing journals, which required refurbishment and replacement of the L-1 (second-last stage) turbine blades. Hydro proceeded with this additional refurbishment work while the turbine rotor was at the OEM's facility and determined that it was most appropriate to execute this scope of work as part of the Overhaul Unit 1 Turbine Valves and Generator (2024) program, as outlined in the 2024 CBA. The additional turbine rotor refurbishment work was completed at the OEM facility, and the rotor was returned to the Holyrood TGS in 2024. Installation and commissioning of the unit were completed in 2025. There were no viable alternatives for this program, and Hydro proceeded with execution.

Refurbish Control Structure (2021–2025) – Ebbegunbaeg

Variance Type	Budget ($000)	Expenditures and Forecast ($000)	Variance ($000)
Project	17,679.0	23,356.6	5,677.6

This five-year project (2021–2025) has carried over into 2026. The project scope of work includes the refurbishment of the three water control gates and associated equipment at the Ebbegunbaeg Control Structure. The remaining scope of work in 2025 included:

- The refurbishment of the stop log gains for all three gates—completed in 2025; and
- The replacement of the screw stem hoist systems for Gates 1 and 3—carried over to 2026 due to late delivery of the new equipment.

The forecasted variance in overall project expenditures is attributed to:

- Higher-than-originally-estimated contract tendered pricing for refurbishment work completed on Gates 1 and 2 in 2023 and 2024, respectively;

[58] Approved by the Board in Order No. P.U 12(2023).

- Greater extent of required refurbishment of the lintels for Gates 1 and 2 identified during the detailed inspection, compared to the budget allowance for this work;
- The forecasted cost increase to refurbish Gates 1 and 3 screw hoists and the upstream stoplog gains for all three bays; and
- Greater internal engineering, construction management, and project management effort required during the construction and commissioning of the work from 2023 to 2026.

There are no viable alternatives for this project, and Hydro is proceeding with execution.

4.1.3 Approved Budgets Between $1 and $5 Million

Diesel Genset Replacement Program (2023–2025)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	1,125.8	2,102.9	977.1
Program	2,408.2	3,457.1	1,048.9

This three-year program (2023–2025) has carried over into 2026. The program scope of work includes:

- Replacement of Unit 2053 and replace or upgrade associated equipment at the Hopedale Diesel Generating Station; and
- Replacement of Unit 2056 and the replacement or upgrading of the associated equipment at the St. Brendan's Diesel Generating Station, which was completed in 2023.

In 2023, Hydro issued a tender for the new 1,067 kW, 1,200 rpm genset planned for Hopedale; tendered pricing was significantly higher than originally estimated. This tender was cancelled. An updated analysis of alternatives concluded that a genset between 700 kW and 850 kW at 1,800 rpm proved to be the least-cost alternative. Hydro changed the scope of work to the lower-cost alternative and extended the project schedule into 2026, as reflected in a budget update in the 2024 CBA.

After the budget update in the 2024 CBA, Hydro anticipated improvements to the schedule and budget, and a further update was provided in the 2025 CBA. At that time, the expected delivery time of the genset was shorter than previously anticipated, which would allow construction to commence in 2024 and be completed in 2025; however, the new unit failed acceptance testing at the factory, and it was not delivered in time to allow for installation to begin in 2024.

The genset was installed, and the associated equipment upgrades and replacements were completed in 2025. The program has carried over into 2026 to address additional scope that was identified during execution:

- Installation of a hydronic heating system for the Hopedale Diesel Generating Station that will utilize waste heat from the diesel genset to heat the powerhouse. This system is expected to lower the overall generating station operating expenditures and reduce the environmental impact through a reduction in the quantity of diesel fuel consumed to power electric heaters. The materials for the heating system were procured, and the system was installed in 2024 and 2025. The installation of the controls for the hydronic heating system is expected to be completed in 2026.
- Installation of a new hospital plus grade silencer[59] to address noise concerns for the surrounding community that were identified following the genset installation. The new silencer is expected to be installed in 2026.

The variance in 2025 expenditures and the forecasted variance in overall program expenditures are attributed to:

- Scope additions of a hydronic heating system and hospital plus grade silencer;
- Unforeseen requirement to utilize contractor resources for the electrical scope of work due to the unavailability of internal forces; and
- Higher-than-originally-estimated project management, engineering and construction expenditures.

Diesel Genset Replacements (2021–2022)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	84.5	283.5	199.1
Program	2,846.8	3,346.8	500.0

[59] A hospital plus grade silencer is a high-performance exhaust silencer providing superior noise attenuation for critical, ultra-low noise environments such as hospitals and residential areas.

This two-year program (2021–2022) carried over and was completed in 2025. The program scope included the replacement of a diesel genset and the upgrade of associated mechanical, electrical, and protection and control equipment at the Nain Diesel Generating Station.

The program scope was substantially completed in 2022. A portion of the plant automation work carried over due to protection and control resources being dedicated to higher-priority work. Work completed in 2023–2024 included installation of communications equipment, field modifications to the main switchgear, and engineering design for modifications to the Generator G4 switchgear. The remaining work—modification of the G4 switchgear and updates to the overall plant automation system—was completed in 2025.

The variance in 2025 expenditures and the variance in overall program expenditures are attributed to:

- Carrying the program an additional three years due to resource constraints; and
- Use of a contractor for the remaining switchgear modifications due to unavailability of internal construction resources, resulting in additional engineering, project management and construction expenditures.

Overhaul Diesel Units (2025)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	1,000.0	1,102.3	102.3
Program	1,000.0	1,102.3	102.3

This one-year program (2025) closed in 2025. The program scope is to overhaul diesel gensets when they reach or exceed the recommended number of operating hours between overhauls.

The variance in 2025 and overall program expenditures is attributed to higher-than-originally-estimated materials and contract expenditures for the engine overhaul of Unit 2074 at the Hopedale Diesel Generating Station. This over-expenditure was partially offset by fewer overhauls required in 2025 than were included in the budget estimate. At the time of the budget estimate preparation, six overhauls were anticipated in 2025, whereas five were required. There were no viable alternatives for this scope of work, and Hydro proceeded with execution.

Overhaul Major Pumps (2025) – Holyrood

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	1,101.9	2,826.1	1,724.2
Program	1,101.9	2,826.1	1,724.2

This one-year program (2025) closed in 2025. This program included the inspection and associated refurbishments and replacements of major pumps for the three generating units at the Holyrood TGS. Pumps are overhauled on an average interval of 12 years, except for the boiler feedwater pumps, which are typically overhauled on a 6-year cycle, depending on the condition of the pump's internal components.

Despite continued maintenance and refurbishment of major pumps at the Holyrood TGS, reliability and operational issues have persisted due to their age and deterioration. When the Life Extension Condition Assessment ("LECA") that was conducted by Hatch Ltd. ("Hatch") as part of the *Reliability and Resource Adequacy Review* proceeding ("*RRA Study Review*")[60] was refreshed in March 2025,[61] a review of the failure history of cooling water, vacuum, and condensate extraction pumps indicated that failures are occurring within the 12-year overhaul cycle. As such, it was recommended to reduce the overhaul interval for these major pumps to be less than 12 years and to include the pump motor in the overhaul plan. The recommendation to include the pump motor in the overhaul plan has been incorporated into the scope of this program beginning in 2026.

The original program scope of work for 2025 included the following work at the Holyrood TGS:

- Overhaul the Unit 3 West Boiler Feedwater Pump, completed in 2025; and
- Replacement of the Unit 3 North Vacuum Pump including the motor and all required components such as valves, discharge separator tank, liquid cooler, instrumentation, and control devices, completed in 2025.

[60] "*Reliability and Resource Adequacy Study Review* – Assessment to Determine the Potential Long-Term Viability of the Holyrood Thermal Generating Station," Newfoundland and Labrador Hydro, March 31, 2022, att. 2.
[61] "*Reliability and Resource Adequacy Study Review* – Holyrood Thermal Generating Station Capital Plan Refresh," Newfoundland and Labrador Hydro, March 7, 2025, att. 1.

The variance in 2025 and overall program expenditures is primarily attributed to:

- The addition of the Unit 2 East Boiler Feedwater Pump and motor overhaul that was originally planned for 2024, but was deferred to 2025 due to the requirement to shorten the planned Unit 2 outage in 2024[62], leaving insufficient time to overhaul the pump;
- The advancement of the Unit 3 North Extraction Pump and motor overhaul from 2029 to 2025 due to in-service failure of some components during the 2024–2025 winter operating season; and
- The addition of the Unit 3 South Extraction Pump and motor overhaul, originally planned for 2026 but advanced to 2025 due to the in-service failure of a similar Unit 3 North Extraction Pump.

There were no viable alternatives for this program's scope of work, and Hydro proceeded with execution.

Perform Boiler Condition Assessment and Miscellaneous Upgrades (2025) – Holyrood

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	4,905.8	8,085.7	3,179.9
Program	4,905.8	8,085.7	3,179.9

This one-year program (2025) closed in 2025. The program scope was to perform a Level 2 Condition Assessment on the internal components of the boilers and associated high-energy piping and to complete refurbishment work required before the winter operating season.

The variance in 2025 and overall program expenditures was primarily attributed to the extent of the required boiler refurbishment work. Upon disassembly and assessment of the boilers in 2024[63] and 2025, the level of necessary refurbishment identified for execution in 2025 was greater than anticipated at the time of the original budget estimate.[64] The project is required for the continued safe and reliable

[62] The Unit 2 outage was shortened in 2024 due to system conditions and to ensure that planned outages to other generating units could proceed as required for critical work.
[63] Boiler condition assessment results and recommendations from the prior year (2024 in this case) are typically not available at the time of capital budget estimate preparation for the following year (2025 in this case).
[64] A summary of refurbishment work identified and executed in 2025 as part of the Boiler Condition Assessment and Miscellaneous Upgrades (2025) – Holyrood program is included in Appendix B.

operation of the boilers for Units 1, 2, and 3 and associated high-energy piping through the Bridging Period[65] until the capacity of Holyrood TGS can be adequately replaced, and therefore proceeded with execution.

Perform Major Inspection – Synchronous Condenser 2 (2025–2026) – Wabush

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	22.8	850.5	827.7

This two-year program (2025–2026) commenced in 2025. The program scope is to perform a major inspection of Wabush Synchronous Condenser 2 ("SC2") and complete any necessary refurbishment work identified during the inspections.

An unexpected failure of the SC2 rotor poles occurred in January 2025, which required the refurbishment of the rotor by the OEM. This scope of work was added to this program and completed in 2025, as reflected in a budget update included within the 2026 CBA.[66] To leverage the duration of the unplanned outage resulting from the rotor poles' failure, the majority of the planned major inspection activity was advanced from 2026 to 2025. The program will remain open in 2026 to complete the remaining inspection activities.

The variance in 2025 expenditures is attributed to the unplanned rotor refurbishment work and the opportunistic advancement of the majority of the planned inspection activity from 2026 to 2025. There are no identified viable alternatives for this program, and Hydro is proceeding with the work.

Refurbish Superstructure (2023–2024) – Salmon River Spillway

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	113.2	247.4	134.2

[65] Hydro considers the Bridging Period to be from the present to 2030. During the Bridging Period, the system would rely primarily on existing sources of generation capacity to maintain reliability while new generation capacity is built. The primary, readily available supply options in this period are extending the retirements of the Holyrood TGS, the Stephenville Gas Turbine, and the Hardwoods Gas Turbine until their capacities can be adequately replaced.
[66] "2026 Capital Budget Application," Newfoundland and Labrador Hydro, July 15, 2025, vol. I, sch. 5, s. 2.8.

This two-year project (2023–2024) carried over and was completed in 2025. The original project scope of work included the refurbishment of the Salmon River Spillway steel superstructure. Most of the original project scope of work was cancelled, as explained herein.

During execution of the planned structural analysis as part of this project, the engineering consultant advised that more extensive refurbishment and/or replacement of the superstructure would be required, which could include replacing steel members and installing additional supports, or a full replacement of the superstructure. Such a level of refurbishment would require significantly more expenditures than were budgeted in this project. As a result, the following scopes of work that would have directly interfaced with structural members were cancelled and may be reconsidered in a future CBA:

- Replacement of deteriorated grout beneath column base plates;
- Replacement of defective welds with bolted connections;
- Replacement of horizontal bracing and gusset plates;
- Replacement of expansion joints; and
- Surface preparation and application of the coating system.

Hydro completed the following project scopes of work that would not be impacted by future superstructure refurbishment work or were required to address safety risks:

- Completion of a structural analysis;
- Replacement of missing anchors;
- Replacement of handrails on spillway bridge deck with traffic barriers;
- Replacement of the access ladder to the top of the superstructure; and
- Replacement of missing/deteriorated bolts.

Hydro completed the following additional scopes of work that were identified during the project execution to address safety hazards:

- Replacement of handrails on the upper superstructure deck;
- Installation of new safety gates; and

- Installation of fall arrest anchors and lifelines.

The variance in 2025 expenditures is primarily attributed to construction contract expenditures exceeding the amount included in the revised project estimate following the above-noted project scope changes. During construction, there was a requirement identified to modify the new traffic barrier posts and guardrails because of interference with rebar in the concrete and existing electrical equipment. The traffic barrier railing was also modified to enable removable sections for future crane access to the structure, concrete piers, and gate height indicators.

Refurbish Surge Tank 1 (2024–2025) – Bay d'Espoir

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	2,206.1	3,404.5	1,198.5
Project	2,287.2	3,485.7	1,198.5

This two-year project (2024–2025) was completed in 2025. The project scope of work included the refurbishment of the interior of Surge Tank 1 at Bay d'Espoir in accordance with the condition assessment completed by an external consultant.

The variance in 2025 and overall project expenditures is primarily attributed to higher-than-originally-estimated contract pricing. Hydro issued an open call for bids to complete the contractor scope of work, which resulted in no compliant bidders. Hydro did not award this tender and then issued a limited call to all registered bidders and two additional potential bidders. Hydro received one compliant bid, from the same original bidder, which was materially higher than the estimated contract cost included in the original project budget. Hydro awarded the contract, and the work was completed at a higher-than-originally-estimated cost. In addition, a requirement was identified to complete the refurbishment of an exterior section of the surge tank, which was executed in 2025 as part of this project. There were no viable alternatives for this project, and Hydro proceeded with execution.

Renew Circuit Breakers (2025–2026)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Program	2,661.0	2,944.0	283.0

This two-year program (2025–2026) commenced in 2025. The program scope includes the refurbishment or replacement of select 69 kV, 138 kV, and 230 kV circuit breakers.

Hydro is forecasting an increase in the planned number of circuit breakers to be replaced and refurbished under this program. The original budget estimate was based on the replacement of one circuit breaker and the refurbishment of five circuit breakers, as follows:

- Wabush Terminal Station 69 kV Circuit Breaker B4L34 replacement;
- Buchans 69 kV Circuit Breaker B2L64 refurbishment;
- Stephenville 230 kV Circuit Breaker B1L09 refurbishment;
- Upper Salmon 230 kV Circuit Breaker L34L63 refurbishment;
- Western Avalon 230 kV Circuit Breaker B1T1 refurbishment; and
- Western Avalon 230 kV Circuit Breaker B1T2 refurbishment.

As part of a budget update in the 2026 CBA,[67] two additional circuit breaker replacements previously scheduled in 2025 as part of the Renew Circuit Breakers (2024–2025) program are also planned to be completed in this program:

- Hardwoods 66 kV Circuit Breaker B8T3 replacement: This breaker is now planned for replacement in 2026 to better align with long-term asset planning criteria.
- Howley 138 kV Circuit Breaker B1L43 replacement: Previously scheduled for refurbishment, this breaker will now be replaced in 2026. Replacement is required as the OEM has determined that the operating mechanism is obsolete and unable to be refurbished.

The forecasted variance in overall program expenditures is attributed to the increase in the number of circuit breakers to be refurbished since the 2026 CBA budget update. Four additional circuit breaker refurbishments have been transferred to this program from the Renew Circuit Breakers (2024–2025) program, with planned execution in 2026:

- Deer Lake 230 kV Circuit Breaker B3L47 refurbishment and Massey Drive 230 kV Circuit Breaker B1L48 refurbishment, carried over from 2025 due to late delivery of parts from the OEM.

[67] "2026 Capital Budget Application," Newfoundland and Labrador Hydro, July 15, 2025, vol. I, sch. 5, s. 2.7.

- South Brook 138 kV Circuit Switcher L22T1 refurbishment, carried over from 2025 due to the unavailability of the mobile substation required for the work.
- Wabush Terminal Station 46 kV Circuit Breaker B4T7 refurbishment, carried over from 2025 due to cancellation of the OEM representative's travel to Wabush due to service issues at the Wabush Airport; the OEM was unable to reschedule a flight within their availability window in 2025.

There are no identified viable alternatives for this program, and Hydro is proceeding with execution.

Renew Distribution Feeders (2024–2025)

This two-year program (2024–2025) closed in 2025. The original scope of this program for 2024–2025 was to upgrade St. Brendan's Distribution System Line 1 and Bottom Waters Distribution System Line 4. Although there is no over-expenditure and therefore no reportable variance required, Hydro is providing an explanation, as there was a significant change in the scope of work. Specifically, the refurbishment of St. Brendan's Line 1 was cancelled.

Prior to completing the detailed engineering for the St. Brendan's work, Hydro identified that there could be a significant change to the system load profile, due to the local home heating fuel oil supplier indicating they would no longer deliver to residential customers in the area. This change presented Hydro with the possibility of unanticipated load growth that would impact the design of the distribution system. The upgrades for St. Brendan's were therefore removed from the scope of work of the Renew Distribution Feeders (2024–2025) program and will be considered in a future year, when there is greater certainty in the load profile.

Refurbishment of Bottom Waters Line 4 was completed in 2025 at a higher cost than originally estimated. During detailed project planning, it was determined that temporary generation would be required during construction to reduce the impact on customers, the cost of which was not included in the original budget estimate. Upon review, Hydro identified an alternative design for upgrading the distribution line that involved re-routing a portion of the line, and would not require temporary generation. This alternative design was determined as the least-cost option compared to the original scope of work with the temporary generation included, and Hydro proceeded with the work.

Additional unforeseen expenditures to complete the refurbishment of Bottom Waters Line 4 were less than the budget estimate for the cancelled St. Brendan's work; therefore, the overall program expenditures were less than budget.

Replace Diesel Genset 1 (2023–2024) – Ebbegunbaeg

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	421.1	525.3	104.2
Project	1,026.3	1,130.5	104.2

This two-year project (2023–2024) carried over and was completed in 2025. The project scope included the replacement of Diesel Genset 1 and the associated auxiliary equipment at the Ebbegunbaeg Control Structure, as well as conducting a load study to determine appropriate unit sizing prior to replacement. The project was carried over to 2025 due to engineering and construction resource limitations in 2024. The variance in 2025 and overall project expenditures is attributed to:

- Additional labour expenditures associated with a requirement to schedule the construction in multiple phases due to limited on-site accommodations;
- Additional labour expenditures required to address various technical challenges during testing and commissioning of the new genset;
- Storage preservation expenditures for the new diesel genset and additional interest during construction costs related to project carryover into 2025; and
- Structural steel material costs for outdoor-mounted equipment that were not included in the original budget estimate.

There were no viable alternatives for this project, and Hydro proceeded with execution.

Replace Diesel Gensets (2024–2026)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	833.8	2,447.6	1,613.8

This three-year program (2024–2026) commenced in 2024. The program scope of work includes:

- Replacement of Unit 2085 at the Nain Diesel Generating Station with a new 1,600 kW 1,800 rpm diesel genset;
- Replacement of Unit 3033 at Makkovik Diesel Generating Station with a 545 kW 1,800 rpm diesel genset;
- Design, procurement, and installation of associated equipment for both gensets, including exhaust stack, radiator, aftercooler, switchgear with breaker, and all other equipment necessary to facilitate the proper function of the new units; and
- Upgrade some existing protection and control equipment for both new gensets, including additions to the motor control centre programmable logic controller ("PLC") cabinet, modifications to the main PLC, and modification/testing of PLC logic.

The variance in 2025 expenditures is attributed to the delivery of the two new gensets in 2025, ahead of their expected delivery date in 2026. The early delivery of the genset for Makkovik allowed for its installation to be advanced and completed in 2025. The remaining scope of work is expected to be completed in 2026.

Replace Disconnects (2024–2025)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	1,346.0	2,093.7	747.7
Program	1,485.5	2,233.2	747.7

This two-year program (2024–2025) closed in 2025. The program scope of work included the replacement of select high voltage disconnect switches at various terminal stations, and originally anticipated replacement of 17 disconnect switches. Three more disconnect switch replacements were added to the program for completion in 2025:

- Bay d'Espoir 230 kV Disconnect Switch B1B10-2 and Oxen Pond 66 kV Disconnect Switch B2B3, carried over from the Replace Disconnect Switches (2023–2024) program due to outage unavailability in 2024.
- Bear Cove 138 kV B1L56-BP, advanced from a future year due to an in-service failure.

The following disconnect switch replacements have been deferred to the Replace Disconnect Switches (2025-2026) Replacement Program due to outage unavailability in 2025:

- Wabush Terminal Station 230 kV Disconnect/Ground Switches B1T1/T1G;
- Wabush Terminal Station 230 kV Disconnect/Ground Switches B1L23-2/L23G;
- Stony Brook 230 kV Disconnect/Ground Switches L05L35-2/L35G; and
- Sunnyside L100L109-2/L109G Ground Switch Modifications.

The variance in 2025 and overall program expenditures is attributed to:

- Higher-than-originally-estimated procurement and construction expenditures for the originally planned disconnect switches that were replaced; and
- Higher net cost for the added disconnect switch replacement scopes of work compared to the scopes of work deferred to the future program.

There were no viable alternatives to this program, and Hydro proceeded with execution.

Replace Protective Relays (2024–2025)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	3,508.9	4,157.8	648.9
Program	3,439.1	5,120.0	1,680.9

This two-year program (2024–2025) closed in 2025. The program scope of work includes the replacement of protective relay systems at various terminal stations and generating stations; it originally anticipated the replacement of 16 systems in 2024–2025. Ten more protective relay system replacements were added to the program for completion in 2025 as a result of transfers of incomplete scopes from the Terminal Station Renewal (2023–2024) program and Upgrades for the Future Retirement of Stephenville Gas Turbine project, including protective relay systems for:

- Granite Canal Generator G1;
- Granite Canal Transformer T1;
- Western Avalon Transmission Line TL 237;
- Come By Chance Transmission Line TL 237;

- Stephenville Transformer T3;
- Stephenville Transformer GT1;
- Bottom Brook Transformer T1;
- Bottom Brook Transformer T3;
- Bottom Brook Transmission Line TL 214; and
- Sunnyside Transformer T4.

Completion of the following protective relay work scopes has been deferred from 2025 to 2026 and transferred from this program to the Replace Protective Relays (2025–2026) program:

- Buchans Transmission Line TL 228, due to unavailability of resources in 2025;
- Massey Drive Transmission Line TL 228, due to the unavailability of internal resources in 2025;
- Come By Chance Transformer Protection T1; and
- Come By Chance Transformer Protection T2.[68]

The variance in 2025 expenditures and the variance in overall program expenditures is attributed to:

- The net increase in the number of protection systems replaced;
- Utilization of contractor resources for five of the protective relay replacements, as internal forces did not have the capacity to execute all additional scope; and
- Labour and consultant expenditures that exceeded the original estimates for several protective relay replacements.

There were no viable alternatives to this program, and Hydro proceeded with execution.

Replace Unit 2047 (2021-2023) – Ramea

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	2,436.8	3,167.4	730.6

[68] This protective relay work for Transformers T1 and T2 at Come by Chance is specifically assigned to Braya Renewable Fuels ("Braya"). Given some uncertainty surrounding the customer's operations in 2025, these protective relay replacements were deferred to 2026. Hydro assessed this deferral as low risk, and the customer was consulted and has no objections to the deferral.

This three-year supplemental project (2021–2023) has carried over into 2026. The project scope includes the replacement of Unit 2047 in the Ramea Diesel Generating Station with a new 500 kW, 1,800 rpm diesel genset and the replacement of the associated exhaust stack, radiator, aftercooler, switchgear, and breaker. The scope of work also includes the installation of fuel coolers and upgrades to some existing protection and control equipment, and the existing cooling system.

The new genset and associated new mechanical and electrical components were installed and placed in service in 2024. Challenges with the availability of protection and control engineering and construction resources resulted in the carryover of a portion of the automation and communications work to 2025 and 2026. The majority of the remaining automation and communications scope of work was completed in 2025. Modification of the engine hall PLC, representing approximately 3% of the overall project scope, has carried over into 2026.

The forecasted variance in overall project expenditures is attributed to the following required activities that were not included in the budget estimate:

- Additional labour and travel expenditures for resources to complete the construction and commissioning activities;
- An external engineering consultant for the commissioning of switchgear modifications;
- Replacement of the silencer for the new unit to reduce noise in the community; and
- Modifications of the powerhouse hydronic heating system and fire alarm system for compatibility with the new genset.

There were no viable alternatives for this project, and Hydro is proceeding with execution.

Upgrade Power Transformers (2024–2025)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Program	3,575.9	5,209.2	1,633.3

This two-year program (2024–2025) closed in 2025. The program scope includes the refurbishment of power transformers at a number of terminal stations. The variance in overall program expenditures is attributed to:

- Additional transformer refurbishments completed in 2025 deferred from the Terminal Station Renewal (2023–2024) program due to:
  - Challenges in sourcing a supplier for new oil dehydrators;
  - Unavailability of equipment outages at the Stephenville Terminal Station; and
  - Lack of access to the mobile substation required for work at Glenburnie and Wiltondale Terminal Stations.
- Additional transformer bushing replacements at the Sunnyside and Stephenville Terminal Stations are required to comply with federal PCB[69] regulations; and
- Additional refurbishments based on updated asset condition assessments.

This over-expenditure was partially offset by deferral of several scopes of work from this program to the Upgrade Power Transformers (2025–2026) program, primarily due to late delivery of materials and construction resource scheduling challenges. There were no viable alternatives for this program, and Hydro proceeded with execution.

Upgrade Power Transformers (2025–2026)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Program	1,985.8	2,732.3	746.5

[69] Polychlorinated biphenyls (“PCB”).

This two-year program (2025–2026) commenced in 2025. The program scope includes the refurbishment of power transformers at a number of terminal stations. The forecasted variance in overall program expenditures is attributed to additional planned transformer refurbishment activities in 2026, including:

- Happy Valley Transformer T4 and Rocky Harbour Transformer T1 on-line oil dehydrator installations, paused in 2025 for further analysis to determine if the equipment is still required, and transferred from the Upgrade Power Transformers (2024-2025) program.
- Peter's Barren Transformer T1 dissolved gas analyzer installation and on-line tap changer overhaul, transferred from the Upgrade Power Transformers 2024–2025 program to coordinate with other planned work at Peter's Barren in 2026.
- Upper Salmon Transformer SS1 high voltage bushings replacement required to comply with federal PCB regulations.

There are no identified viable alternatives for this program, and Hydro is proceeding with execution.

Wood Pole Line Management Program (2025)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	4,281.3	5,877.5	1,596.2
Program	4,281.3	5,877.5	1,596.2

This one-year program (2025) closed in 2025. This annual program scope is to inspect, refurbish, or replace wood pole transmission line components, including poles, structures, hardware, and conductors.

The variance in 2025 and overall program expenditures is attributed to re-pacing of work originally planned for 2024 into 2025. Hydro experienced higher contract expenditures in 2024 compared to historical costs, and additional activities were required to mitigate environmental risk when accessing transmission lines through bogs and wetlands. There are no viable alternatives for this program other than re-pacing of the work. To partially mitigate the over-expenditure in 2024, Hydro reviewed the timing of the program activities and deferred a portion of the work to 2025 and 2026. The re-pacing was not established in time to inform the estimate in the 2025 CBA, but the estimate for the 2026 CBA was adjusted.

4.1.4 Approved Budgets Under $1 Million

Inspect Fuel Tanks (2024) – Hardwoods Gas Turbines

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	628.8	974.7	345.9
Project	692.9	1,038.8	345.9

This one-year project (2024) carried over and was completed in 2025. The project scope of work was to inspect the fuel storage tank at the Hardwoods Gas Turbine and complete any necessary tank refurbishment.

The variance in 2025 and overall project expenditures is attributed to refurbishment activities required to address inspection findings beyond the budget allowance for tank refurbishment. Specifically, it was required to replace internal steel plates and refurbish the bottom perimeter of the tank to address settlement. This over-expenditure was partially offset by the budget for an engineering consultant that was not required. There were no viable alternatives for this project, and Hydro proceeded with execution.

Inspect Fuel Tanks (2025) – Stephenville

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	676.9	1,048.2	371.3
Project	676.9	1,048.2	371.3

This one-year project (2025) was completed in 2025. The project scope of work includes the inspection of the three fuel storage tanks at the Stephenville Gas Turbine and completing any necessary tank refurbishment. The variance in 2025 and overall project expenditures is attributed to:

- Higher-than-originally-estimated tendered pricing for the fuel tank inspections; and
- Refurbishment activities to address inspection findings that were higher than the budget allowance for tank refurbishment. Specifically, it was required to apply protective coating on the floor and the first metre of the shell for each of the three tanks.

There were no viable alternatives for this project, and Hydro proceeded with execution.

Install Breaker Failure Protection (2023-2024) – Sunnyside

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	92.1	621.0	528.9
Project	289.7	1,477.5	1,187.8

This two-year project (2023–2024) carried over and was completed in 2025. The project scope of work addresses upgrades to the 230 kV breaker failure protection at Sunnyside Terminal Station. The variance in 2025 expenditures and the variance in overall project expenditures are primarily attributed to:

- Execution of a portion of the scope of work at Sunnyside by contractor resources in 2025, due to the unavailability of resources.
- The addition of breaker failure protection upgrades at Oxen Pond and Massey Drive Terminal Stations, which were partially completed as part of the scope for the Terminal Station Refurbishment and Modernization (2021–2022) program, as approved as part of the 2021 CBA, but could not be fully completed in 2022 due to resource challenges and outage unavailability.
- Additional effort required to complete the scope of work due to the unforeseen complexity of the work and difficulty in scheduling the required outages required to complete the work.

The work at Massey Drive was completed in 2023. The work at Sunnyside and Oxen Pond was substantially completed in 2025, and the remaining deficiency work will be completed under the Install Breaker Failure Protection (2025–2027) - Holyrood project. There were no viable alternatives to this project, and Hydro proceeded with execution.

Perform Level 2 Condition Assessment – Intake 4 and Unit 7 Draft Tube (2025) – Bay d'Espoir

Variance Type	Budget ($000)	Expenditures and Forecast ($000)	Variance ($000)
Project	471.5	1,122.7	651.2

This one-year project (2025) has carried over into 2026. The project scope of work is to perform a Level 2 Condition Assessment of Bay d'Espoir Intake 4 and the Powerhouse 2[70] draft tube structure.

The majority of the field inspection activity for this condition assessment was unable to proceed in 2025 due to the unavailability of stop logs required for dewatering the equipment for inspection. The existing stop logs that can be used for any of the seven generating units at Bay d'Espoir were in use on other units for their annual outages in 2025. An additional set of stop logs was purchased in 2025 on a separate project[71] and were expected to be available for this condition assessment work; however, they could not be used due to design issues, which will be resolved by the supplier under warranty. This prevented the condition assessment of the Intake 4 head gate, gains, and embedded parts from being completed in 2025.

Additionally, a delay in the start of the planned outage to Bay d'Espoir Unit 7 due to constraints on the Island Interconnected System prevented the completion of work utilizing a remotely operated vehicle ("ROV"). The consultant was unable to align their availability with the revised outage dates, preventing the condition assessment of the Unit 7 draft tube gains and embedded parts by use of an ROV.

The consultant completed the condition assessment work that was possible without the use of stop logs and a generation outage. The forecasted variance in overall project expenditures is attributed to:

- Higher-than-originally-estimated consultant pricing to perform the Level 2 Condition Assessment study following an open call for bids; and
- Additional consultant costs anticipated for remobilization in 2026 to complete the remaining inspections.

There are no viable alternatives for this project, and Hydro is proceeding with execution.

[70] Powerhouse 2 houses Bay d'Espoir Unit 7, and Intake 4 is the intake for Unit 7.
[71] The stop logs were procured on the under $750,000 project "Procure Stop Logs Units 1–7 (2025) – Bay d'Espoir", as reported in "Quarterly Regulatory Report for the Quarter Ended March 31, 2025," Newfoundland and Labrador Hydro, rev. August 5, 2025 (originally filed June 30, 2025), tab 1, sec. 6.1, Table 13.

Replace Annunciator – Phase 2 (2024–2025) – Bay d'Espoir

Variance Type	Budget ($000)	Expenditures and Forecast ($000)	Variance ($000)
Annual	333.7	786.3	452.6
Project	481.6	1,162.8	681.2

This two-year project (2024–2025) has carried over into 2026. The project scope includes the replacement of the Bay d'Espoir Units 1 to 6 obsolete annunciator panels with a PLC-based system. Project carryover into 2026 is attributed to protection and control engineering and construction resource limitations in 2024 and 2025. The Bay d'Espoir Units 1, 2, and 3 annunciator panels were replaced in 2025, and the replacement of the Units 4, 5, and 6 annunciator panels is expected to be completed in 2026.

The variance in 2025 expenditures and forecasted variance in overall project expenditures is attributed to additional project management, engineering, procurement, and construction costs to address evolved design philosophy and scope of work refinement, including:

- An increase in PLC hardware requirements, network architecture and panel sizes to accommodate future planned generating unit and spherical valve controls upgrades;
- An increase in PLC hardware and cabling requirements for the transfer of transducers and gauges for generating unit monitoring, trips, and alarms from the existing turbine-generator panel to the new PLC-based system;
- Additional network switches and cabling to provide redundancy in communications links/paths, for improved reliability; and
- Replacement of cabling from existing field devices to the annunciator panels that were determined to contain PCBs.

There are no viable alternatives for this project, and Hydro is proceeding with execution.

Replace Instrument Transformers (2024–2025)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	621.3	1,095.7	474.3
Program	869.7	1,344.0	474.3

This two-year program (2024–2025) closed in 2025. The program scope included the replacement of instrument transformers at various terminal stations and generating stations, and originally anticipated the replacement of 13 instrument transformers. The planned replacement of Cat Arm Transmission Line TL 247 C phase potential transformer was removed from this program scope for replacement under a separate project titled Replace Power Line Carrier (2024–2025) – TL247. The replacement of four instrument transformers was added to the scope:

- Hardwoods 230 kV Circuit Breaker B2L42 A, B, and C phase current transformers, transferred from the Replace Instrument Transformers (2023–2024) program, which did not proceed in 2024 due to late delivery of the new equipment as a result of delays in Measurement Canada approvals; and
- Churchill Falls 230 kV Bus B24 A phase capacitive voltage transformer, added to this program due to the possible presence of PCBs in the oil for this sealed unit.

Engineering and procurement were completed for all scopes in 2024 and 2025, but the construction portion of the following ten scopes has been transferred from this program to the Replace Instrument Transformers (2025–2026) program:

- Hardwoods 230 kV B2L42 A, B, and C phase current transformers, due to outage unavailability in 2025;
- Holyrood 230 kV B12L18 A, B, and C phase current transformers, due to resource unavailability in 2025;
- Wabush Terminal Station 230 kV Breaker B1L23 A, B, and C phase current transformers, due to vendor equipment delivery delays; and
- Stony Brook 230 kV Bus B1 B phase potential transformer, due to installation issues in 2025 that require correction.

The variance in 2025 and overall program expenditures is attributed to:

- Expenditures for the four added scope items;
- Higher-than-originally-estimated project management expenditures; and
- Higher cost per unit than was budgeted.

There were no viable alternatives for this program, and Hydro proceeded with execution.

Replace Instrument Transformers (2025–2026)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Program	468.9	924.8	455.9

This two-year program (2025–2026) commenced in 2025. The program scope includes the replacement of instrument transformers in various terminal and generating stations.

The program scope originally anticipated the replacement of 5 instrument transformers; 13 instrument transformers were added to the scope:

- The construction portions of ten instrument transformer replacements were added to this program from the Replace Instrument Transformers (2024–2025) program.[72]
- Three replacements were added to this program due to the possible presence of PCBs in the oil for these sealed units:
  - Churchill Falls 230 kV Transmission Line L24 A phase capacitive voltage transformer; and
  - Churchill Falls 230 kV Transmission Line L23 A and C phase capacitive voltage transformers.

The forecasted variance in overall program expenditures is attributed to the increase in the number of instrument transformers to be replaced, as described herein. There are no viable alternatives for this program, and Hydro is proceeding with execution.

[72] Details on these ten instrument transformers are provided in the Replace Instrument Transformers (2024–2025) variance explanation within this report.

Replace Intermediate Fuel Storage Tanks (2023–2024) – Nain

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	721.1	1,313.8	592.7

This two-year project (2023–2024) carried over and was completed in 2025. The project scope included increasing the intermediate fuel storage system capacity at the Nain Diesel Generating Station by replacing the existing 45,000 L intermediate fuel storage tank with two new 60,000 L intermediate fuel storage tanks. The scope of work included expanding the plant yard to accommodate the larger tank footprint and modifying the associated mechanical piping and protection and control systems.

The variance in overall project expenditures is associated with higher-than-originally-estimated contract pricing for the construction work. Hydro tendered the work in early 2024 but did not award the contract as the tendered pricing significantly exceeded the budget estimate. Opportunities to optimize the design and construction strategy were then considered, and Hydro incorporated an improvement in construction strategy that eliminated the need for a mobile crane to be brought to the site. The project estimate and cost-benefit analysis were updated; it was confirmed that the chosen alternative to increase the intermediate fuel supply capacity remained the least-cost alternative. The additional time to review the project estimate and alternatives analysis resulted in the project carrying over to 2025. The work was re-tendered, awarded, and completed in 2025.

4.2 General Plant

4.2.1 Approved Budgets Over $5 Million

Replace Light- and Heavy-Duty Vehicles (2024–2026)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Program	6,761.3	8,240.6	1,479.3

This three-year program (2024–2026) began in 2024. The program scope is to replace light- and heavy-duty vehicles and includes accessorizing, as required, based on the purposes of the vehicles. The original budget estimate was based on the planned replacement of 30 light-duty vehicles and eight heavy-duty vehicles. As part of a budget update in the 2026 CBA,[73] the scope was expanded to include:

- Procurement of an additional eight light-duty vehicles due to unforeseen in-service failures; the failed vehicles did not merit repair costs, given their age, high usage, and/or condition.
- One heavy-duty vehicle that was ordered as part of the Replace Light- and Heavy-Duty Vehicles (2022–2024) program but was not received until 2025.

Since the budget update in the 2026 CBA, the scope was further expanded to include:

- Two additional heavy-duty vehicles that were ordered as part of the Replace Light- and Heavy-Duty Vehicles (2022–2024) program but were not received until 2025–2026.

The forecasted variance in overall program expenditures is attributed to the additional two heavy-duty vehicles, as explained herein. There are no viable alternatives for this program, and Hydro is proceeding with execution.

4.2.2 Approved Budgets Between $1 and $5 Million

Install Ultra-Fast DC Electric Vehicle Chargers (2023–2025)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	2,059.8	2,779.8	720.0

This three-year supplemental project (2023–2025) has carried over into 2026. The project scope is to expand the capacity of the province's Electric Vehicle ("EV") fast charging network in partnership with the Government of Newfoundland and Labrador and the Government of Canada.

The forecasted variance in overall project expenditures is attributed to an increase in the planned number of charging stations installed. The original project scope included the procurement and installation of seven ultra-fast direct current EV chargers at five of Hydro's most utilized charging sites along the Trans-Canada Highway. In 2024, additional funding was secured from the Government of

[73] "2026 Capital Budget Application," Newfoundland and Labrador Hydro, July 15, 2025, vol. I, sch. 5, s. 2.3.

Newfoundland and Labrador, and the number of planned new chargers has increased to ten. The project has been carried over to 2026 to allow for completion of the additional chargers. Furthermore, the start of construction was delayed due to challenges securing property lease agreements at the host sites, resulting in the carryover of some commissioning activities for certain chargers.

Replace Light- and Heavy-Duty Vehicles (2023–2025)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	1,428.7	2,305.9	877.2
Program	4,566.0	5,443.2	877.2

This three-year program (2023–2025) closed in 2025. The program scope of work was to replace light- and heavy-duty vehicles and included accessorizing, as required, based on the purposes of the vehicles. The original budget estimate was based on the planned replacement of 39 light-duty vehicles and 6 heavy-duty vehicles. As part of a budget update in the 2025 CBA, the scope was changed to include the replacement of an additional seven light-duty vehicles, due to unforeseen in-service failures in 2024, and the budget was updated to address higher-than-originally-estimated actual costs for vehicle purchases.

The variance in 2025 and overall program expenditures is attributed to:

- The delivery of one heavy-duty vehicle that was ordered as part of the Replace Light- and Heavy-Duty Vehicles (2021–2022) program and received in 2025.

There were no viable alternatives for this program, and Hydro proceeded with execution.

Replace Mobile Equipment (2025–2027)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Program	4,647.6	5,230.5	582.9

This three-year program (2025–2027) commenced in 2025. The program scope is to replace light- and heavy-duty mobile equipment and includes accessorizing, as required, based on the purposes of the equipment. The scope for this 2025–2027 program includes:

- The replacement of three heavy-duty assets (2 tracked aerial device units and 1 wheel loader backhoe);
- The replacement of 38 non-heavy-duty assets (14 snowmobiles, 12 ATVs, 11 trailers, and 1 forklift); and
- An allowance to address in-service failures for mobile equipment in 2025.

The forecasted variance in overall program expenditures is attributed to:

- Higher-than-originally-estimated procurement costs for two tracked aerial device units; and
- Higher-than-originally-estimated expenditures for equipment refurbishment or replacement to address in-service failures in 2025.

There are no viable alternatives for this program, and Hydro is proceeding with execution.

Replace Powerhouse 1 Roof (2024–2025) – Bay d'Espoir

Variance Type	Budget ($000)	Expenditures and Forecast ($000)	Variance ($000)
Project	1,959.4	2,328.4	369.0

This two-year project (2024–2025) has carried over into 2026. The project scope includes the replacement of the Bay d'Espoir Powerhouse 1 roof membrane system and the replacement of the rooftop fall protection system. The start of construction in 2025 was delayed due to the requirement to investigate and mitigate electrical induction hazards associated with high-voltage power lines in the vicinity of the roof. This requirement resulted in additional time for engineering to develop and implement a solution to ground all metal surfaces on the roof so that work could be performed safely. Upon completion, installation of the new roof system commenced and was approximately 90% completed in 2025. The installation of a portion of the roofing system in areas near high voltage powerlines and the permanent roof guardrail system for fall prevention could not be completed in 2025

due to unfavourable weather and difficulty in securing the required outages for safe work execution. The remaining work will be completed in 2026.

The forecasted variance in overall project expenditures is attributed to:

- Additional contractor costs for remobilization and demobilization in 2026; and
- Additional project management, engineering, and construction management costs associated with project carryover into 2026.

There are no viable alternatives for this project, and Hydro is proceeding with execution.

Replace VHF Radio Systems (2024–2025)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	1,552.2	1,858.2	306.0

This two-year project (2024–2025) has carried over into 2026. The purpose of the project is to replace the functionality previously provided by the Very High Frequency ("VHF") radio system to allow for improved worker safety and efficiency. Hydro originally proposed to install a combination of mobile and fixed push-to-talk capable satellite phones, as well as a small number of fixed cellular phones. Mobile installations were to include vehicle-mounting kits with vehicle antennas, and fixed installations were to include desk-mounting kits, antennas, cellular boosters, and cabling.

During project planning, Hydro identified alternative solutions that would provide broader service coverage, better data capabilities, and higher reliability. As a result, Hydro cancelled the original scope of work to install satellite and cellular services and is implementing the following alternatives:

- Hydro is procuring and installing radios as part of the Government of Newfoundland and Labrador's P25 Provincial Wide Radio System ("PWRS"), a system used by provincial police, health, and fire services. The PWRS has improved coverage and performance compared to cellular service, and has inter-operations capabilities with dedicated channels.
- In select fleet vehicles, Hydro is installing Starlink communications systems coupled with Cradle Point routers for a secure path to Hydro Place. These systems allow the connection of existing cellular phones and laptops in remote areas where there is no PWRS or cellular coverage.

The forecasted variance in overall project expenditures is attributed to an increase in engineering labour and material expenditures associated with the change in project scope from satellite phones to P25 radios. The additional time taken to review alternative technology solutions resulted in the project carrying over to 2026. Installation of approximately half of the communications equipment was completed in 2025, with the remainder carried over to 2026.

Upgrade Water and Fire Suppression Systems (2023–2024) – Bishop's Falls

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	3,240.0	5,800.0	2,560.0

This two-year project (2023–2024) has carried over into 2026. The project scope of work includes:

- Installation of a new water supply line from the town near the Botwood Highway (Route 350), close to the Bishop's Falls Complex;
- Installation of dedicated domestic water and firewater distribution lines; and
- Upgrading the fire suppression system in the main building of the Bishop's Falls Complex.

The project has carried over into 2026 due to the increased duration required for the project design phase, and longer-than-originally-expected lead times for some of the new components. During the engineering design, a fire hydrant flow test produced unusually low flow rate and pressure values from the town's water supply, resulting in significant challenges with sizing the new fire pump. This delayed the sizing and procurement of the generator, load bank, and panel, leading to a delayed start of construction. Significant construction progress was made in 2025, but has carried over for completion in 2026.

The forecasted variance in overall project expenditures is attributed to procurement and construction expenditures that are higher than the original budget estimate. It was determined during the engineering design that a new pumphouse building and a backup fire pump generator are required. There are no viable alternatives for this project, and Hydro is proceeding with execution.

4.2.3 Approved Budgets Under $1 Million

Refurbish Control Building (2024–2025) – Grandy Brook and Doyles

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	554.1	913.9	359.8

This two-year project (2024–2025) has carried over into 2026. The project scope is to refurbish the interior and exterior of the Grandy Brook and Doyles Terminal Station Control Buildings. Due to increased time required for engineering and procurement activities, the start of construction was delayed. As a result, construction was approximately 90% complete in 2025, with the remaining activities carrying over to 2026.

The forecasted variance in overall project expenditures is attributed to:

- Higher-than-originally-estimated expenditures for the consultant's detailed engineering design; and
- Higher-than-originally-estimated expenditures for the construction contractor.

There are no viable alternatives for this project, and Hydro is proceeding with execution.

Supply & Install Work Stations Levels 3 & 4 (2025) - Hydro Place; and
Perform Office Renovations (2025-2026) – Hydro Place

There is no actual or forecast over-expenditure and therefore no reportable variance required for these two projects; however, Hydro is providing an explanation with respect to their approval as projects under $750,000.

In 2025, Hydro commenced two under $750,000 scopes of work to address office renovation needs in Hydro Place for resource expansion:

- Supply & Install Work Stations Levels 3 & 4 (2025) – Hydro Place: Required for resources associated with Major Projects, completed in 2025 with actual expenditures of $707,330; and

- Perform Office Renovations (2025–2026) – Hydro Place: Required for resources, commencing in 2025 and expected to be completed in 2026 with a forecast overall expenditure of $633,400.[74]

The project scope of work is to supply and install additional workstations and modify existing layouts to accommodate an increased worker count. The proposed workstations are necessary to complement the ongoing measures to maximize workspaces in the building and provide adequate conditions for employees.

The Supply & Install Work Stations - Levels 3 & 4 (2025) - Hydro Place project was completed for less than $750,000, and the Perform Office Renovations (2025-2026) - Hydro Place project is expected to be completed for less than $750,000; however, together they account for a total over the legislated threshold. These projects were initiated to address rapidly evolving project responsibilities and resource needs and were not considered in the same time frame. As such, Hydro believes they acted in accordance with the Provisional Guidelines with respect to these two projects. Hydro acknowledges that, had these renovations been identified in similar timeframes, a single supplemental application over $750,000 could have been submitted for the Board's approval. Hydro attempts to make every reasonable effort to submit similar scopes of work as a single proposal, and will continue to review any future projects with estimated budgets under $750,000 to determine if there is any opportunity to combine with other similar projects.

Upgrade SCADA Network (2024)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	109.4	272.0	162.6
Project	402.3	843.7	441.4

This one-year project (2024) carried over and was completed in 2025. The project scope was to upgrade the current Supervisory Control and Data Acquisition ("SCADA") network to a modern and cyber-secure Ethernet-based operational network, to provide reliable connectivity from the Energy Control Centre to the remote terminal units at terminal stations, generating facilities, and hydraulic control structures.

[74] Office renovation expenditures that are not related to Hydro's regulated business are charged to and recovered from Hydro's non-regulated business segment through an admin fee; they are not charged to Hydro's regulated customers.

The variance in 2025 expenditures and in overall project expenditures is attributed to the following factors:

- The Great Northern Peninsula and Labrador regions of the SCADA network were not accounted for in the original estimate, but are required as part of the upgrade.[75] As such, additional devices were needed to support the inclusion of these areas.
- A newly identified requirement to implement firewalls for cybersecurity was not included in the initial budget. Additionally, further infrastructure was necessary to allow future firewall maintenance, which requires system redundancy.
- The engineering and deployment efforts required for this project exceeded those estimated.

There were no viable alternatives for this project, and Hydro proceeded with execution.

Water System Condition Assessment and Upgrades (2023–2024) – Bay d'Espoir

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	665.9	1,387.0	721.1

This two-year project (2023–2024) carried over and was completed in 2025. The project scope is to complete improvements to the Bear Brook water supply system in Bay d'Espoir, which includes the replacement of the water storage tank and the relocation of a section of the water line located at Bear Brook Crossing. The project scope also includes a condition assessment of the remaining system components to identify issues and assist with the planning of future capital refurbishment work necessary to maintain system reliability. The project carried over into 2025 due to procurement delays during tendering and the longer-than-anticipated lead time for the new water storage tank.

[75] As communicated to the Board and intervenors in Hydro's response to CA-NLH-067, filed as part of Hydro's 2026 CBA, the exclusion of the scope of work required for the Great Northern Peninsula and Labrador regions from the original estimate was an unintentional omission. Hydro intended to upgrade the whole SCADA network, but the listing of SCADA equipment for those regions was inadvertently omitted during the budget estimate preparation.

The variance in overall project expenditures is primarily attributed to higher-than-originally-estimated contract pricing to procure and install the replacement water storage tank and to relocate the section of water line. In addition, project and construction management expenditures were higher than what was estimated as a result of extension to the project construction schedule. The schedule extension of approximately two months was due to:

- Required replacement of the original seals provided with the contractor-supplied water storage tank;
- Resource issues with the tank installation contractor which caused the initial crew to demobilize and a replacement crew to remobilize at a later date; and
- Impacts from the road closure of the Bay d'Espoir Highway (Route 360) during the Martin Lake fire in August 2025.

There were no viable alternatives for this project, and Hydro proceeded with execution.

4.3 System Growth

4.3.1 Approved Budgets Over $5 Million

Additions for Load - Wabush Substation Upgrades (2021–2025); and

Additions for Load Growth - Upgrade Transformer Capacity (2023–2028) – Jean Lake Terminal Station

Two projects were ongoing in 2025 for work in the Wabush Substation:

1. Additions for Load - Wabush Substation Upgrades (2021-2025);[76] and
2. Additions for Load Growth - Upgrade Transformer Capacity (2023-2028) - Jean Lake Terminal Station.[77]

These projects correspond to two phases of capacity upgrades to meet forecasted peak loads and improve the reliability of the station.[78] While there is currently no reportable variance for these projects

[76] This was originally approved as a three-year (2021–2023) project and was re-budgeted in subsequent budget applications as a five-year (2021–2025) project.
[77] This was originally approved as a two-year (2023–2024) project and was re-budgeted in subsequent budget applications as a six-year (2023–2028) project.
[78] At the conclusion of the upgrades, the Wabush Substation will be renamed the Jean Lake Terminal Station.

in 2025, Hydro is providing an explanation with respect to a review of the budget and required timing for this work.

The scope of work for the Additions for Load – Wabush Substation Upgrades (2021–2025) project is to add transformer capacity, install circuit breakers and other electrical equipment, install SCADA system, replace the control building, and re-route the distribution feeder lines running into the station. Distribution feeder lines re-routing is complete. A new 46/25-12.5 kV, 20/26.7/33.3 MVA Transformer, T1, was procured and installed in a temporary location and Transformers T3 and T5 have been retired. The new control building was constructed, and the required protection, control, and communications equipment and battery systems were installed. The remaining work is to expand the current footprint of the station and install new steel box structures to facilitate permanent connection of the new Transformer T1, new high voltage and low voltage circuit breakers, new high voltage and low voltage disconnect switches and relocated reclosers, disconnects and associated equipment. The new transformer will then be moved from its temporary location to its final location.

The scope of work for the Additions for Load Growth – Upgrade Transformer Capacity (2023–2028) – Jean Lake Terminal Station project is to remove Transformers T4 and T6 and associated equipment and replace with a new 46/25-12.5 kV, 20/26.7/33.3 MVA Transformer T2 and associated low voltage circuit breaker; disconnect switches; bus; surge arrestors; protection, control, and communications equipment; and civil work required to accommodate the new equipment including oil spill containment for Transformer T2. The new transformer has been ordered and is expected to be received in 2026. No on-site construction has been completed for this project as of April 1, 2026.

Recent project experience in Wabush indicates significantly higher construction contract and materials costs than originally estimated. As a result, Hydro paused these two projects in 2025[79] and initiated a review of the budget and schedule. The outcome of this review will inform the estimate for the remaining work, confirm the least-cost alternative, and update system analysis to determine the

[79] Hydro paused the initiation of any new procurement and construction activities, but there were expenditures in 2025, and there are forecast expenditures in 2026 related to the receipt and temporary placement of the new transformer that had been ordered before the pause. There are also ongoing project management expenditures associated with the budget and schedule review. Hydro has confirmed that pausing the project is not expected to significantly impact its ability to reliably serve load while the project is being executed.

required project timeline. Following this review, Hydro intends to seek approval from the Board of a revised budget and schedule for the remaining project scope of work.[80]

Wabush Terminal Station Upgrades (2021–2024)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	883.4	1,680.2	796.8
Project	12,678.1	17,172.1	4,494.0

This four-year project (2021–2024) has carried over into 2026. The project scope is to replace Transformers T4 and T5 and install a new Capacitor Bank C3 to support Hydro's ability to provide firm supply for customers in accordance with the transmission system criteria established in Western Labrador. The project is substantially complete with the new Capacitor Bank C3 installed in 2023, Transformer T5 installed in 2024, and Transformer T4 installed in 2025. The project carried over to 2026 for the dismantling and removal of the former Transformer T4.

The variance in 2025 expenditures and forecasted variance in overall project expenditures is primarily attributed to higher-than-originally-estimated contract supply and construction costs for Transformers T4 and T5 and the Capacitor Bank C3. Market rates for construction services significantly exceeded the estimates prepared during the budget proposal phase, with particularly elevated costs observed for work in Labrador. There are no viable alternatives to this project, and Hydro is proceeding with execution.

4.3.2 Approved Budgets Between $1 Million and $5 Million

Additions for Load Growth – Unit 2065 Replacement and Fuel Storage Upgrades (2024–2027) – Rigolet

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	254.6	1,831.3	1,576.7
Project	3,429.2	3,843.9	414.7

[80] Hydro currently anticipates that this budget request will be included as part of the 2027 CBA.

This four-year project (2024–2027) commenced in 2024. The project scope of work is to replace Unit 2065 at the Rigolet Diesel Generating Plant with a 545 kW-rated diesel genset and replace the three existing horizontal fuel storage tanks with larger tanks to increase fuel storage capabilities.

Hydro is advancing the schedule for this project to address the timing of growing electricity needs in the community of Rigolet, specifically to provide electrical service for a new Department of Health and Social Development building. The majority of the genset procurement and installation activity originally planned for 2026–2027 is now expected to be completed in 2025–2026. Additionally, the fuel storage tank procurement and installation were advanced from 2026 to 2025. This schedule advancement is reflected in a budget update as part of the 2026 CBA.

The variance in both annual and overall project expenditures is attributed to the higher-than-originally-estimated expenditures for the fuel storage tank procurement and installation, and the advancement of work. The final sizing and selection of fuel storage tanks resulted in a requirement for five tanks to replace the existing three tanks, with expenditures exceeding the original budget estimate. Tank installation activity was originally planned to be executed by internal resources in 2026; with the work advancing into 2025, internal resources were not available, and a contractor was utilized, resulting in higher costs than were originally estimated. There were no viable alternatives with respect to the fuel storage tanks, and Hydro proceeded with execution.

4.3.3 Approved Budgets Under $1 Million

Additions for Load (2022) – Distribution System – Mary's Harbour Voltage Conversion

This two-year project (2022–2023) carried over and was closed in 2025. The original project scope was to increase the capacity of the service conductor cable to address the load growth occurring in Mary's Harbour due to a new seafood processing plant. Although there is no over-expenditure and therefore no reportable variance required, Hydro is providing an explanation, as there was a significant change to the scope of work.

The new service conductor cable was purchased in 2022, but was not installed. In early 2023, a decision was made to pause the project and review the justification, particularly as it related to the application for the construction of Hydro's Long-Term Supply Plan for Southern Labrador,[81] wherein interconnection

[81] "Long-Term Supply for Southern Labrador," Newfoundland and Labrador Hydro, rev. October 5, 2023 (originally filed July 16, 2021.

of Mary's Harbour to a regional plant would negate the requirement for this service conductor cable replacement. Since pausing the project, Hydro has conducted temperature measurements of the existing cable during peak load conditions. These measurements have shown that the existing cables have remained within design parameters, and immediate replacement has not been required. In 2025, it was decided to close this project and to retain the purchased conductor cable as a capital spare. Should conditions change and the service conductor cable needs to be installed, a new budget proposal will be prepared. Expenditures in this project for the engineering and planning of the conductor cable installation are treated financially as "work-in-progress" until either a subsequent project is approved, completed, and in service, or it is determined that the project will never be required.[82]

4.4 Access

4.4.1 Approved Budgets Between $1 and $5 Million

Provide Service Extensions (2025)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	4,662.5	5,386.1	723.6
Program	4,662.5	5,386.1	723.6

This single-year program (2025) closed in 2025. The scope of this annual program is to provide service extensions to customers, with the budget based on historical data from each region. The variance in 2025 and overall program expenditures is attributable to an increase in the number of service extensions required compared to the budget allowance, and higher market pricing for materials per service extension completed.

4.5 Service Enhancement

4.5.1 Approved Budgets Over $5 Million

Replace Metering System (2022–2024)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	189.0	1,388.7	1,199.7
Project	5,875.8	9,295.5	3,419.7

[82] Expenditures in this project treated as "work-in-progress" total $119,030, as provided in Appendix A to this report.

This three-year project (2022–2024) carried over and was completed in 2025. The project scope of work was to replace manually read meters and obsolete TS1 meters with a drive-by automatic meter reading system.[83] The variance in 2025 expenditures and the variance in overall project expenditures are primarily attributed to contract labour expenditures necessary to complete the project. As previously reported in Hydro's Capital Expenditures and Carryover Report for the Year Ended December 31, 2024,[84] the original project plan was to utilize internal resources to complete the installation of the meters; however, the pace of meter replacements was slower than anticipated due to resource constraints. Hydro hired internal temporary resources to support project completion and utilized contractors to install approximately 16,000 meters. Also contributing to the variance are the higher costs associated with project management and implementation of the associated information systems. Additional installation costs incurred late in the project to replace deteriorated meter bases deemed unsafe for meter installation, and labour and travel costs required to complete meter replacements in remote locations with challenging site conditions further contributed to the variance.

As communicated to the Board and intervenors in CA-NLH-068, filed as part of Hydro's *2026 CBA* proceeding,[85] Hydro reviewed the cost-benefit analysis of alternatives and confirmed that the solution implemented remained the least-cost alternative, consistent with Hydro's obligations under section 3(b)(iii) of the *Electrical Power Control Act, 1994*.

Table 1: Updated Replace Metering System Cost-Benefit Analysis with updated AMR Capital Costs

Alternative	CPW Value	CPW Difference between Alternative and Least-Cost Alternative
AMR Drive By System	11,885,988	
Mesh AMI[1] System	13,901,879	2,015,891
Continue with Manually-Read Meters	15,614,913	3,728,925

[1] Advanced metering infrastructure ("AMI").

Figure 1: Extract from Hydro's Response to CA-NLH-058, filed as part of the 2025 CBA proceeding

[83] This project is distinct from the Upgrade PLX Metering System (2026–2028) project proposal in the 2026 CBA, which is for the purchase and replacement of meters for Hydro's residential, commercial and industrial customers in the Happy Valley-Goose Bay, Sheshatshiu, and North West River areas that are currently equipped with obsolete PLX technology.
[84] "Capital Expenditures and Carryover Report for the Year Ended December 31, 2024," Newfoundland and Labrador Hydro, April 1, 2025.
[85] As per Hydro's response CA-NLH-068, filed as part of the *2026 CBA* proceeding, which was previously provided as Hydro's to CA-NLH-058, filed as part of the *2025 CBA* proceeding. This has been included as Figure 1, for ease of reference.

Since this analysis was completed, the project incurred additional costs of approximately $1.2 million in the final year of execution associated with deteriorated meter bases and challenging site conditions as described above. These additional costs would also have been incurred for the AMI alternative, and thus did not change the determination of the least-cost alternative.

4.5.2 Approved Budgets Between $1 and $5 Million

Upgrade Worst-Performing Distribution Feeders (2024–2025)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Annual	2,984.3	5,198.4	2,214.0
Program	3,291.7	5,505.7	2,214.0

This two-year program (2024–2025) was completed in 2025. The program scope of work is to refurbish a distribution feeder located in the L'Anse-au-Loup Distribution System, which was prioritized through the examination of reliability performance data and confirmed as requiring upgrades to the existing infrastructure based on condition assessments.

The variance in 2025 and overall project expenditures is primarily attributed to a change in the scope of work and the need to provide temporary power generation to minimize customer impact, the cost of which was not included in the original budget estimate. During detailed project planning, it was determined that completing the original scope as planned would have required multiple customer outages and the deployment of at least three mobile generators, introducing additional risks such as extended service interruptions and environmental hazards from fuel spills. Upon review, Hydro identified an alternative design involving a partial rebuild of the line as the most cost-effective and reliable option. This revised approach reduced the need for temporary generation to a single mobile generator and significantly limited the number of affected customers and the duration of outages.

The variance in overall program expenditures is also attributed to the contractor's over-projection of the work achievable during planned outages, which required Hydro to supplement the contractor with its own crews in completing the work.

4.6 Mandatory

4.6.1 Approved Budgets Under $1 Million

Replace Terminal Station Lighting (2023–2024)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)
Project	917.4	1,432.2	514.8

This two-year project (2023–2024) carried over and was completed in 2025. The project scope of work was to replace terminal station service lighting at various sites. The variance in overall project expenditures is attributed to:

- Higher-than-originally-estimated construction, project management, procurement and engineering costs;
- Utilization of a contractor for the lighting replacements at Sunnyside at higher expenditures than estimated; and
- Expansion of the project scope to include required lighting replacements at Hardwoods Terminal Station and generating unit transformer bays at Bay d'Espoir.

There were no viable alternatives for this project, and Hydro proceeded with execution.

4.7 Allowance for Unforeseen

Hydro did not identify any work in 2025 that necessitated the use of the Allowance for Unforeseen Items Account.

5.0 Lease/Purchase Approval Approach

Hydro did not execute any capital leases in 2025.

6.0 Carryover Report

In 2025, Hydro carried over $36.5 million of budget to future years; this includes carryover of $14.5 million associated with the deferred completion of work scopes previously planned for completion in 2025 and $22.0 million associated with reallocation of cost-flow within the years of approved projects and programs. For comparison, the average carryover amount for the previous ten years (2016–2025)

was $29.8 million. Chart 23 shows Hydro's capital carryover for the years 2016–2025 and the average carryover.

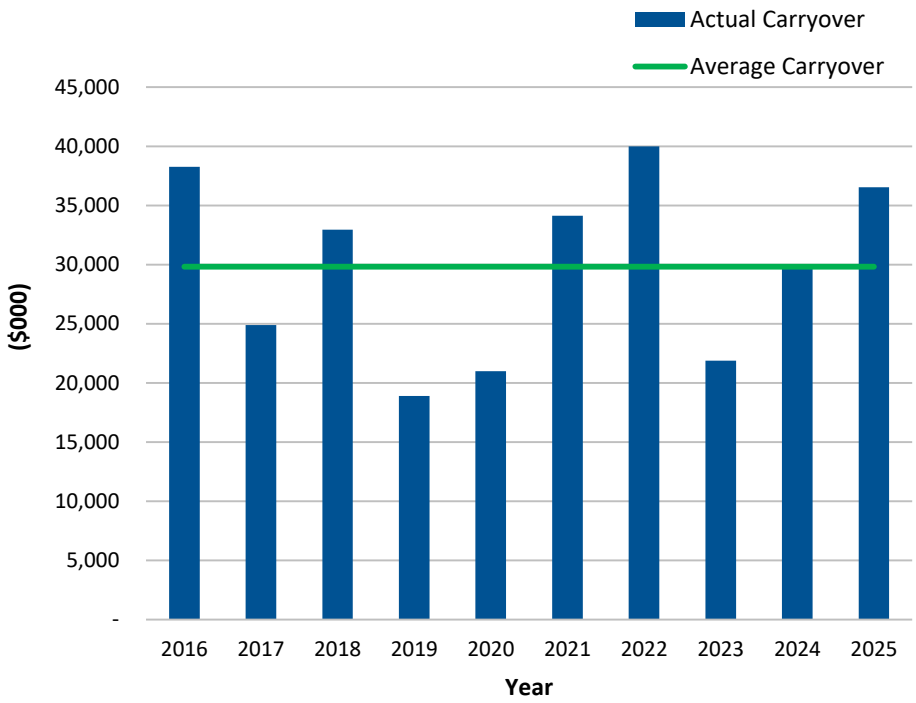


Chart 23: Carryover by Year (2016–2025)

With a large and complex capital program, some degree of carryover is to be expected and is managed through established project management practices that incorporate continual improvement methodologies. This carryover can be due to:

- Changes in strategy, such as deferring projects due to changing timing requirements;
- External factors like supply chain disruptions; and
- Resource scheduling challenges.

Hydro's analysis of 2025 expenditure variances concluded that the main drivers of carryover of capital activities from 2025 to future years were:

- Challenges scheduling sufficient design and construction resources for the volume and timing of required work;

- Work paused to re-assess scope, budget, project timelines or justification;
- Delayed delivery of materials from vendors;
- Unforeseen challenges that arose during design and procurement; and
- Unavailability of required specialized tools or equipment.

This carryover was partially offset by the necessary advancement of some project and program activities from future years into 2025.

As part of its annual work planning cycle, in the early part of the calendar year, Hydro determines the risk associated with a one-year delay in completing each capital program and project work scope. This allows Hydro to minimize the risk of carryover if constraints prevent Hydro from executing all planned work. Hydro utilizes an established project change management process to identify the impacts of carryover and to develop temporary mitigation plans to reduce the impact where possible until the work can be completed.

7.0 Conclusion

Hydro's 2025 capital expenditures totalled $223.5 million, $12.9 million (5.5%) below budget. Projects and programs that underspent their individual 2025 approved budgets were partially offset by projects and programs that exceeded their individual 2025 approved budgets, and were largely offset by projects carried over from 2024 into 2025.

The primary driver of under-expenditures within capital programs and projects in 2025 was the carryover of activities to future years due to:

- Challenges scheduling sufficient design and construction resources for the volume and timing of required work;
- Work paused to re-assess scope, budget, project timelines or justification;
- Delayed delivery of materials from vendors; unforeseen challenges that arose during design and procurement; and
- Unavailability of tools or equipment.

In 2025, Hydro carried over $36.5 million of budget to future years, compared to the previous ten-year carryover average of $29.8 million. Hydro has assessed the risks associated with the delayed completion of these projects and, where necessary, has applied appropriate mitigations. As such, none of the projects carried over into 2026 represents a significant risk to the supply of electricity to customers.

The primary driver of overspending in capital programs and projects in 2025 was the completion of planned work at a net higher cost than the original budget estimates. Most of these over-expenditures were for costs that were necessary for successful completion of the project or program objectives but unforeseen at the time of the original budget estimates; specifically, additional scope to address condition assessment findings resulted in exceeding the budget allowances for such work.

Hydro proposes these projects and programs required to maintain safe, reliable, least-cost service to its customers, in an environmentally responsible manner. Hydro strives to execute all approved scopes of work when they are required and inevitably experiences some carryover of work each year. Hydro utilizes established project management practices and procedures to monitor, control, and manage this carryover. These practices and procedures incorporate continual improvement methodologies to ensure that lessons learned are captured and leveraged.

Hydro continues to review its capital budget planning and execution methodologies and uses its expenditures analysis to identify opportunities to reduce capital expenditure variances in future years.

Appendix A

Financial Schedules



2025 Capital Expenditures Summary by Year
($000) [1]

Year	Actual Expenditure and Forecast				Capital Budget					Variance		
	A				B	C	D (B+C)	E	F (A+C+E)	K-F		H-D
	2021	2022	2023	2024	Carryover to 2025	Original 2025	Revised 2025	2026 and Beyond	Total	Project		Annual
2025	-	-	-	-	-	88,171.53	88,171.53	50,063.85	**138,235.38**	16,327.28	11.81%	(6,981.56) -7.92%
2024	-	-	-	22,497.28	12,796.66	43,579.34	56,376.00	7,474.88	**73,551.50**	17,491.94	23.78%	4,632.44 8.22%
2023	-	-	6,956.68	19,849.69	11,097.01	68,624.13	79,721.14	13,123.50	**108,554.00**	3,820.67	3.52%	(9,883.05) -12.40%
2022	-	7,245.80	16,828.70	1,204.80	1,509.61	-	1,509.61	-	**25,279.30**	2,783.74	11.01%	1,153.06 76.38%
2021	9,593.55	16,723.80	5,221.30	9,329.50	5,163.37	5,466.70	10,630.07	-	**46,334.85**	9,703.25	20.94%	(1,794.62) -16.88%
Total	**9,593.55**	**23,969.60**	**29,006.68**	**52,881.27**	**30,566.64**	**205,841.70**	**236,408.34**	**70,662.23**	**391,955.02**	**50,126.87**		**(12,873.73)**

Year	G				H	I	J			K (G+H+I+J)
	2021	2022	2023	2024	2025	2026 and Beyond	Carryover to 2026 and Beyond			Total
							Project Carryover	Multi-Year Cash Flow Reallocation		
2025	-	-	-	-	81,189.96	50,063.85	7,028.57	16,280.28	**154,562.66**	
2024	-	-	-	21,441.17	61,008.44	7,474.88	2,334.80	(1,195.85)	**91,043.44**	
2023	-	-	6,274.55	13,376.76	69,838.10	13,123.50	2,879.96	6,881.79	**112,374.66**	
2022	-	7,390.97	12,482.36	5,527.05	2,662.67	-	-	-	**28,063.04**	
2021	4,843.88	9,696.42	17,778.91	12,545.00	8,835.45	-	2,338.43	-	**56,038.09**	
Total	**4,843.88**	**17,087.38**	**36,535.82**	**52,889.98**	**223,534.61**	**70,662.23**	**14,561.76**	**21,966.21**	**442,081.89**	

[1] Numbers may not add due to rounding.

2025 Capital Expenditures Summary by Category
($000)[1]

	Actual Expenditure and Forecast														Variance		
	A				Capital Budget				G				H	I	J	K (G+H+I+J)	K-F	H-D	
Category	2021	2022	2023	2024	B Carryover to 2025	C Original 2025	D (b+C) Revised 2025	E 2026 and Beyond	F (A+C+E) Total	2021	2022	2023	2024	2025	2026 and Beyond	Carryover to 2026 and Beyond Project Carryover	Carryover to 2026 and Beyond Multi-Year Cash Flow Reallocation	Total	Project	Annual
Hydraulic Plant	3,236.82	6,208.90	10,151.30	13,639.39	2,966.31	88,386.53	91,352.84	14,475.90	**136,098.84**	2,196.44	6,966.10	10,014.89	15,203.49	84,503.94	14,475.90	5,320.48	8,156.51	**146,837.77**	10,738.92	(6,848.90)
Thermal Plant	-	-	-	6,403.87	859.27	31,120.17	31,979.44	1,295.60	**38,819.64**	-	-	-	12,098.20	39,159.68	1,295.60	4,127.87	-	**56,681.35**	17,861.72	7,180.25
Gas Turbines	-	-	-	884.30	658.67	3,489.31	4,147.98	400.96	**4,774.57**	-	-	-	225.63	6,016.99	400.96	251.25	(488.32)	**6,406.51**	1,631.94	1,869.01
Terminal Stations	3,488.42	14,300.40	8,901.80	12,533.43	10,171.32	24,775.89	34,947.22	23,652.40	**87,652.34**	1,094.61	6,311.30	19,103.35	10,472.48	26,160.69	23,652.40	710.72	433.49	**87,939.03**	286.69	(8,786.52)
Transmission	-	-	-	-	-	5,349.10	5,349.10	822.60	**6,171.70**	-	-	-	-	6,254.48	822.60	-	1,630.38	**8,707.47**	2,535.77	905.38
Distribution	-	-	-	2,684.51	2,166.67	17,786.86	19,952.53	6,694.42	**27,164.79**	-	-	-	517.84	19,358.17	6,694.42	340.53	128.59	**27,039.56**	(125.23)	(594.36)
Generation	2,868.31	2,944.70	3,629.30	1,563.77	2,626.44	5,305.16	7,931.60	12,296.66	**28,607.90**	1,552.83	1,545.54	2,487.29	4,149.87	11,940.34	12,296.66	113.05	5,177.11	**39,262.69**	10,654.79	4,008.74
Properties	-	-	353.70	2,886.30	5,073.68	1,878.16	6,951.84	901.30	**6,019.46**	-	-	316.19	410.13	4,661.06	901.30	2,131.75	188.46	**8,608.90**	2,589.44	(2,290.78)
Metering	-	515.60	4,365.60	1,297.20	320.17	660.60	980.77	568.10	**7,407.10**	-	2,264.44	1,993.35	3,820.44	2,194.57	568.10	-	2,298.81	**13,139.72**	5,732.62	1,213.81
Tools and Equipment	-	-	-	240.90	(346.35)	5,130.70	4,784.35	2,681.10	**8,052.70**	-	-	-	587.25	3,077.02	2,681.10	-	168.59	**6,513.95**	(1,538.75)	(1,707.34)
Information Systems	-	-	234.38	816.90	842.21	7,149.73	7,991.94	784.39	**8,985.39**	-	-	36.32	163.16	4,547.80	784.39	380.90	4,122.96	**10,035.51**	1,050.12	(3,444.14)
Telecontrol	-	-	-	3,116.80	2,377.23	5,182.30	7,559.53	132.40	**8,491.50**	-	-	-	1,095.41	6,498.01	132.40	910.17	149.64	**8,785.63**	354.13	(1,061.52)
Transportation	-	-	1,370.60	5,829.70	2,152.79	7,768.00	9,920.79	5,956.40	**20,924.70**	-	-	2,584.43	3,658.08	7,391.02	5,956.40	275.04	-	**19,864.96**	(1,059.74)	(2,529.77)
Administration	-	-	-	984.20	698.22	860.20	1,558.42	-	**1,844.40**	-	-	-	488.00	1,770.85	-	-	-	**2,258.85**	414.45	212.43
Allowance for Unforeseen Items	-	-	-	-	-	1,000.00	1,000.00	-	**1,000.00**	-	-	-	-	-	-	-	-	-	(1,000.00)	(1,000.00)
Total	**9,593.55**	**23,969.60**	**29,006.68**	**52,881.27**	**30,566.64**	**205,841.70**	**236,408.34**	**70,662.23**	**391,955.02**	**4,843.88**	**17,087.38**	**36,535.82**	**52,889.98**	**223,534.61**	**70,662.23**	**14,561.76**	**21,966.22**	**442,081.89**	**50,126.87**	**(12,873.73)**

[1] Numbers may not add due to rounding.

2025 Capital Expenditures Summary By Investment Classification
($000)[1]

	Actual Expenditure and Forecast																Variance			
	A				Capital Budget				G				H	I	J	K (G+H+I+J)	K-F		H-D	
Investment Classification	2021	2022	2023	2024	B Carryover to 2025	C Original 2025	D (B+C) Revised 2025	E 2026 and Beyond	F (A+C+E) Total	2021	2022	2023	2024	2025	2026 and Beyond	Carryover to 2026 and Beyond: Project Carryover	Carryover to 2026 and Beyond: Multi-Year Cash Flow Reallocation	Total	Project		Annual	
Access	-	-	-	-	-	5,006.70	5,006.70	933.80	**5,940.50**	-	-	-	-	5,601.67	933.80	-	128.59	**6,664.06**	723.56	12.18%	594.97	11.88%
General Plant	-	-	2,119.68	14,419.46	11,426.81	33,031.39	44,458.20	10,990.09	**60,560.62**	-	-	3,028.09	7,159.81	32,902.81	10,990.09	4,579.57	8,703.14	**67,363.50**	6,802.89	11.23%	(11,555.40)	-25.99%
Mandatory	-	-	323.30	685.70	332.08	1,483.20	1,815.28	278.40	**2,770.60**	-	-	388.68	787.19	2,095.82	278.40	-	(137.70)	**3,412.38**	641.78	23.16%	280.53	15.45%
Renewal	6,105.13	11,957.70	19,894.30	26,979.89	13,456.79	149,344.97	162,801.76	34,376.93	**248,658.92**	3,749.27	10,557.41	18,640.73	33,829.29	167,276.38	34,376.93	9,630.66	4,297.40	**282,358.08**	33,699.16	13.55%	4,474.62	2.75%
Service Enhancement	-	515.60	4,405.20	3,851.80	2,376.87	8,747.80	11,124.67	16,482.90	**34,003.30**	-	2,264.44	2,010.88	4,340.41	9,355.85	16,482.90	96.83	5,547.13	**40,098.44**	6,095.14	17.93%	(1,768.82)	-15.90%
System Growth	3,488.42	11,496.30	2,264.20	6,944.42	2,974.09	7,227.64	10,201.73	7,600.11	**39,021.08**	1,094.61	4,265.54	12,467.43	6,773.28	6,302.09	7,600.11	254.72	3,427.65	**42,185.44**	3,164.36	8.11%	(3,899.64)	-38.23%
Allowance for Unforeseen	-	-	-	-	-	1,000.00	1,000.00	-	**1,000.00**	-	-	-	-	-	-	-	-	**-**	(1,000.00)	-100.00%	(1,000.00)	-100.00%
Total	**9,593.55**	**23,969.60**	**29,006.68**	**52,881.27**	**30,566.64**	**205,841.70**	**236,408.34**	**70,662.23**	**391,955.02**	**4,843.88**	**17,087.38**	**36,535.82**	**52,889.98**	**223,534.61**	**70,662.23**	**14,561.78**	**21,966.21**	**442,081.90**	**50,126.88**		**(12,873.73)**	

[1] Numbers may not add due to rounding.

2025 Capital Expenditures By Investment Classification
Renewal
($000)[1]

	Capital Budget									Actual Expenditure and Forecast									Variance			
	A				B	C	D (B+C)	E	F (A+C+E)	G				H	I	J		K (G+H+I+J)	K-F		H-D	
																Carryover to 2026 and Beyond						
Project	2021	2022	2023	2024	Carryover to 2025	Original 2025	Revised 2025	2026 and Beyond	Total	2021	2022	2023	2024	2025	2026 and Beyond	Project Carryover	Multi-Year Cash Flow Reallocation	Total	Project		Annual	
Replace Human Machine Interface (2025) - Stephenville	-	-	-	-	-	277.00	277.00	-	**277.00**	-	-	-	-	283.58	-	154.42	-	**438.00**	161.00	58.12%	6.58	2.37%
Replace Igniter System (2025-2026) - Hardwoods and Stephenville	-	-	-	-	-	341.41	341.41	104.06	**445.47**	-	-	-	-	-	104.06	-	341.41	**445.47**	-	0.00%	(341.41)	-100.00%
Overhaul Main Enclosure (2025) - Hardwoods	-	-	-	-	-	627.10	627.10	-	**627.10**	-	-	-	-	532.30	-	-	-	**532.30**	(94.80)	-15.12%	(94.80)	-15.12%
Install Carbon Dust Collection System (2025-2026) - Hinds Lake	-	-	-	-	-	244.90	244.90	376.00	**620.90**	-	-	-	-	146.92	376.00	-	97.98	**620.90**	-	0.00%	(97.98)	-40.01%
Gas Turbine In-Service Failures (2025)	-	-	-	-	-	500.00	500.00	-	**500.00**	-	-	-	-	1,868.19	-	-	-	**1,868.19**	1,368.19	273.64%	1,368.19	273.64%
Replace 250 Vdc Battery Bank (2025-2026) - Stephenville	-	-	-	-	-	73.00	73.00	296.90	**369.90**	-	-	-	-	34.85	296.90	-	38.15	**369.90**	-	0.00%	(38.15)	-52.26%
Inspect Fuel Tanks (2025) - Stephenville	-	-	-	-	-	676.90	676.90	-	**676.90**	-	-	-	-	1,048.17	-	-	-	**1,048.17**	371.27	54.85%	371.27	54.85%
Rewind Stator (2025-2026) - Hinds Lake	-	-	-	-	-	5,233.20	5,233.20	9,695.50	**14,928.70**	-	-	-	-	3,309.85	9,695.50	-	3,090.02	**16,095.37**	1,166.67	7.81%	(1,923.35)	-36.75%
Replace Emergency Diesel Genset (2025-2027) - Cat Arm	-	-	-	-	-	266.20	266.20	1,335.00	**1,601.20**	-	-	-	-	103.60	1,335.00	-	162.60	**1,601.20**	-	0.00%	(162.60)	-61.08%
Refurbish Intake 2 (2025-2026) - Bay d'Espoir	-	-	-	-	-	284.40	284.40	3,069.40	**3,353.80**	-	-	-	-	134.21	3,069.40	-	467.67	**3,671.28**	317.48	9.47%	(150.19)	-52.81%
Perform Level 2 Condition Assessment - Intake 4 and Unit 7 Draft Tube (2025) - Bay d'Espoir	-	-	-	-	-	471.50	471.50	-	**471.50**	-	-	-	-	529.09	-	593.64	-	**1,122.73**	651.23	138.12%	57.59	12.21%
Hydraulic In-Service Failures (2025)	-	-	-	-	-	2,000.00	2,000.00	-	**2,000.00**	-	-	-	-	2,723.24	-	-	-	**2,723.24**	723.24	36.16%	723.24	36.16%
Overhaul Hydraulic Units (2025) - Bay d'Espoir	-	-	-	-	-	4,972.40	4,972.40	-	**4,972.40**	-	-	-	-	3,602.66	-	1,322.59	-	**4,925.25**	(47.15)	-0.95%	(1,369.74)	-27.55%
Thermal In-Service Failures (2025)	-	-	-	-	-	3,900.00	3,900.00	-	**3,900.00**	-	-	-	-	3,058.74	-	-	-	**3,058.74**	(841.26)	-21.57%	(841.26)	-21.57%
Overhaul Major Pumps (2025) - Holyrood	-	-	-	-	-	1,101.90	1,101.90	-	**1,101.90**	-	-	-	-	2,826.12	-	-	-	**2,826.12**	1,724.22	156.48%	1,724.22	156.48%
Overhaul Turbine and Valves - Unit 3 (2025) - Holyrood	-	-	-	-	-	15,975.90	15,975.90	-	**15,975.90**	-	-	-	-	19,795.75	-	3,566.26	-	**23,362.01**	7,386.11	46.23%	3,819.85	23.91%
Update Flame Scanners - Unit 3 (2025) - Holyrood	-	-	-	-	-	140.60	140.60	-	**140.60**	-	-	-	-	147.02	-	128.56	-	**275.57**	134.97	96.00%	6.42	4.56%
Perform Level 2 Condition Assessment - Stage I & II Cooling Water Sump Structures (2025) - Holyrood	-	-	-	-	-	1,747.03	1,747.03	-	**1,747.03**	-	-	-	-	1,838.56	-	-	-	**1,838.56**	91.53	5.24%	91.53	5.24%
Perform Boiler Condition Assessment and Miscellaneous Upgrades (2025) - Holyrood	-	-	-	-	-	4,905.80	4,905.80	-	**4,905.80**	-	-	-	-	8,085.68	-	-	-	**8,085.68**	3,179.88	64.82%	3,179.88	64.82%
Refurbish Marine Terminal (2025-2026) - Holyrood	-	-	-	-	-	1,190.80	1,190.80	1,295.60	**2,486.40**	-	-	-	-	467.81	1,295.60	-	540.84	**2,304.25**	(182.15)	-7.33%	(722.99)	-60.71%
Replace Roof (2025) - Grey River	-	-	-	-	-	390.80	390.80	-	**390.80**	-	-	-	-	519.78	-	-	-	**519.78**	128.98	33.00%	128.98	33.00%
Diesel Genset Replacement Program (2025-2027)	-	-	-	-	-	418.20	418.20	5,805.40	**6,223.60**	-	-	-	-	364.91	5,805.40	-	53.29	**6,223.60**	-	0.00%	(53.29)	-12.74%
Overhaul Diesel Units (2025)	-	-	-	-	-	1,000.00	1,000.00	-	**1,000.00**	-	-	-	-	1,102.28	-	-	-	**1,102.28**	102.28	10.23%	102.28	10.23%
Diesel In-Service Failures (2025)	-	-	-	-	-	800.00	800.00	-	**800.00**	-	-	-	-	758.43	-	-	-	**758.43**	(41.57)	-5.20%	(41.57)	-5.20%
Replace Disconnects (2025-2026)	-	-	-	-	-	145.30	145.30	1,245.50	**1,390.80**	-	-	-	-	146.83	1,245.50	-	(1.53)	**1,390.80**	-	0.00%	1.53	1.06%
Replace Instrument Transformers (2025-2026)	-	-	-	-	-	112.50	112.50	356.40	**468.90**	-	-	-	-	131.23	356.40	-	437.20	**924.83**	455.93	97.23%	18.73	16.65%
Renew Circuit Breakers (2025-2026)	-	-	-	-	-	129.70	129.70	2,531.30	**2,661.00**	-	-	-	-	91.63	2,531.30	-	321.07	**2,944.00**	283.00	10.64%	(38.07)	-29.35%
Terminal Station In-Service Failures (2025)	-	-	-	-	-	2,500.00	2,500.00	-	**2,500.00**	-	-	-	-	516.01	-	-	-	**516.01**	(1,983.99)	-79.36%	(1,983.99)	-79.36%
Replace Terminal Station Battery Banks and Chargers (2025-2026)	-	-	-	-	-	123.20	123.20	315.30	**438.50**	-	-	-	-	76.83	315.30	-	46.37	**438.50**	-	0.00%	(46.37)	-37.63%
Replace Protective Relays (2025-2026)	-	-	-	-	-	668.60	668.60	2,282.60	**2,951.20**	-	-	-	-	393.09	2,282.60	-	275.52	**2,951.21**	0.01	0.00%	(275.51)	-41.21%
Upgrade Power Transformers (2025–2026)	-	-	-	-	-	811.90	811.90	1,173.90	**1,985.80**	-	-	-	-	407.88	1,173.90	-	1,150.47	**2,732.25**	746.45	37.59%	(404.02)	-49.76%
Install Breaker Failure Protection (2025–2027) - Holyrood	-	-	-	-	-	177.80	177.80	487.40	**665.20**	-	-	-	-	185.24	487.40	-	(7.44)	**665.20**	-	0.00%	7.44	4.19%
Upgrade Data Alarm Systems (2025-2026) - Hardwoods	-	-	-	-	-	184.00	184.00	188.70	**372.70**	-	-	-	-	40.63	188.70	-	143.37	**372.70**	-	0.00%	(143.37)	-77.92%
Replace Circuit Breaker Reclosing Controllers (2025-2026) - Cow Head and Massey Drive	-	-	-	-	-	104.60	104.60	164.30	**268.90**	-	-	-	-	23.48	164.30	-	81.12	**268.90**	-	0.00%	(81.12)	-77.55%
Perform Major Inspection - Synchronous Condenser 2 (2025-2026) - Wabush	-	-	-	-	-	22.80	22.80	1,249.00	**1,271.80**	-	-	-	-	850.54	1,249.00	-	(827.71)	**1,271.83**	0.03	0.00%	827.74	3630.45%
Transmission In-Service Failures (2025)	-	-	-	-	-	184.30	184.30	-	**184.30**	-	-	-	-	162.32	-	-	-	**162.32**	(21.98)	-11.92%	(21.98)	-11.92%
Wood Pole Line Management (2025)	-	-	-	-	-	4,281.30	4,281.30	-	**4,281.30**	-	-	-	-	5,877.52	-	-	-	**5,877.52**	1,596.22	37.28%	1,596.22	37.28%
Distribution System In-Service Failures, Miscellaneous Upgrades, and Street Lights (2025)	-	-	-	-	-	6,397.00	6,397.00	-	**6,397.00**	-	-	-	-	5,624.91	-	-	-	**5,624.91**	(772.09)	-12.07%	(772.09)	-12.07%
Completion of Fire Restoration – Fourth Floor Hydro Place	-	-	-	750.20	551.81	317.70	869.51	-	**1,067.90**	-	-	-	198.39	953.56	-	-	-	**1,151.95**	84.05	7.87%	84.05	9.67%
Replace Power Line Carrier (2024-2025) - TL247	-	-	-	87.20	(0.98)	667.40	666.42	-	**754.60**	-	-	-	88.18	435.42	-	231.00	-	**754.60**	-	0.00%	(231.00)	-34.66%
Inspect Fuel Tanks (2024) - Hardwoods Gas Turbines	-	-	-	692.90	628.83	-	628.83	-	**692.90**	-	-	-	64.07	974.70	-	-	-	**1,038.77**	345.87	49.92%	345.87	55.00%
Flatten Downstream Slope (2024-2025) - Hinds Lake	-	-	-	276.10	(43.67)	2,953.40	2,909.73	-	**3,229.50**	-	-	-	158.27	1,663.47	-	-	-	**1,821.75**	(1,407.75)	-43.59%	(1,246.26)	-42.83%
Replace Annunciator Panels (2024-2025) - Cat Arm	-	-	-	160.20	19.22	191.20	210.42	-	**351.40**	-	-	-	343.98	259.11	-	-	-	**603.09**	251.69	71.63%	48.69	23.14%
Refurbish Surge Tank 1 (2024-2025) - Bay d'Espoir	-	-	-	175.80	94.66	2,111.40	2,206.06	-	**2,287.20**	-	-	-	81.14	3,404.53	-	-	-	**3,485.67**	1,198.47	52.40%	1,198.47	54.33%
Replace Annunciator - Phase 2 (2024-2025) - Bay d'Espoir	-	-	-	294.10	146.22	187.50	333.72	-	**481.60**	-	-	-	147.88	786.32	-	228.63	-	**1,162.83**	681.23	141.45%	452.60	135.62%
Refurbish Intake 1 (2024-2025) - Bay d'Espoir	-	-	-	272.10	(85.52)	3,071.90	2,986.38	-	**3,344.00**	-	-	-	357.62	3,061.05	-	-	-	**3,418.67**	74.67	2.23%	74.67	2.50%
Upgrade DCS Hardware - Units 1 and 2 (2024-2025) - Holyrood	-	-	-	195.20	132.56	277.30	409.86	-	**472.50**	-	-	-	62.64	553.94	-	-	-	**616.58**	144.08	30.49%	144.08	35.15%
Upgrade Unit 1 Control System (2024-2025) - Holyrood	-	-	-	468.30	(94.29)	184.30	90.01	-	**652.60**	-	-	-	562.59	164.53	-	-	-	**727.12**	74.52	11.42%	74.52	82.79%
Overhaul Unit 1 Turbine Valves and Generator (2024) - Holyrood	-	-	-	5,181.40	540.02	-	540.02	-	**5,181.40**	-	-	-	11,194.98	527.28	-	-	-	**11,722.26**	6,540.86	126.24%	(12.74)	-2.36%
Upgrade UPS 1 & 2 (2024-2025) - Holyrood	-	-	-	263.00	201.11	107.60	308.71	-	**370.60**	-	-	-	61.89	361.18	-	-	-	**423.07**	52.47	14.16%	52.47	17.00%
Upgrade Distribution (2024-2025) - Bay d'Espoir Terminal Station 2	-	-	-	93.20	17.25	331.50	348.75	-	**424.70**	-	-	-	75.95	372.55	-	118.58	-	**567.08**	142.38	33.52%	23.80	6.83%
Renew Distribution Feeders (2024-2025)	-	-	-	1,287.30	1,160.50	1,245.10	2,405.60	-	**2,532.40**	-	-	-	126.80	2,306.56	-	-	-	**2,433.36**	(99.04)	-3.91%	(99.04)	-4.12%
Replace Diesel Gensets (2024-2026)	-	-	-	535.80	355.79	478.00	833.79	2,404.67	**3,418.47**	-	-	-	180.01	2,447.59	2,404.67	-	(2,112.98)	**2,919.29**	(499.18)	-14.60%	1,613.80	193.55%
Upgrade Power Transformers (2024-2025)	-	-	-	864.60	3,309.25	2,711.30	6,020.55	-	**3,575.90**	-	-	-	325.98	4,883.24	-	-	-	**5,209.22**	1,633.32	45.68%	(1,137.31)	-18.89%
Replace Terminal Station Battery Banks and Chargers (2024–2025)	-	-	-	71.80	3.14	120.90	124.04	-	**192.70**	-	-	-	68.66	233.21	-	-	-	**301.88**	109.18	56.66%	109.18	88.02%
Replace Instrument Transformers (2024–2025)	-	-	-	154.90	(93.48)	714.80	621.32	-	**869.70**	-	-	-	248.38	1,095.66	-	-	-	**1,344.04**	474.34	54.54%	474.34	76.34%
Replace Protective Relays (2024–2025)	-	-	-	1,388.40	1,458.19	2,050.70	3,508.89	-	**3,439.10**	-	-	-	962.21	4,157.81	-	-	-	**5,120.02**	1,680.92	48.88%	648.91	18.49%
Replace Disconnects (2024–2025)	-	-	-	127.40	(12.11)	1,358.10	1,345.99	-	**1,485.50**	-	-	-	139.51	2,093.67	-	-	-	**2,233.18**	747.68	50.33%	747.68	55.55%
Upgrade Data Alarm Systems (2024–2025) - Western Avalon Terminal Station	-	-	-	137.00	94.24	156.90	251.14	-	**293.90**	-	-	-	42.76	92.96	-	177.88	-	**313.60**	19.70	6.70%	(158.18)	-62.98%
Renew Circuit Breakers (2024–2025)	-	-	-	183.90	428.07	2,120.10	2,548.17	-	**2,304.00**	-	-	-	92.83	2,178.26	-	-	-	**2,271.09**	(32.91)	-1.43%	(369.91)	-14.52%
Replace Circuit Breaker Reclosing Controllers (2024–2025) - TL247	-	-	-	112.40	77.00	215.80	292.80	-	**328.20**	-	-	-	35.40	202.89	-	-	-	**238.30**	(89.90)	-27.39%	(89.90)	-30.70%
Penstock Life Extension - Phase 1 (2023-2025)	-	-	2,105.00	5,748.29	-	58,022.73	58,022.73	-	**65,876.02**	-	-	1,132.36	6,720.93	54,190.60	-	847.23	-	**62,891.12**	(2,984.90)	-4.53%	(3,832.13)	-6.60%
Diesel Genset Replacement Program (2023-2025)	-	-	819.10	174.00	(289.26)	1,415.10	1,125.84	-	**2,408.20**	-	-	683.62	598.79	2,102.94	-	71.79	-	**3,457.14**	1,048.94	43.56%	977.10	86.79%
Replace Diesel Genset 1 (2023-2024) - Ebbegunbaeg	-	-	298.00	728.30	421.09	-	421.09	-	**1,026.30**	-	-	132.55	472.66	525.33	-	-	-	**1,130.54**	104.24	10.16%	104.24	24.76%
Refurbish Superstructure (2023-2024) - Salmon River Spillway	-	-	328.30	2,500.00	113.23	-	113.23	-	**2,828.30**	-	-	179.00	533.05	247.36	-	-	-	**959.41**	(1,868.89)	-66.08%	134.13	118.45%
Replace Intermediate Fuel Storage Tanks (2023-2024) - Nain	-	-	127.40	593.70	679.70	-	679.70	-	**721.10**	-	-	71.83	510.17	731.84	-	-	-	**1,313.84**	592.74	82.20%	52.14	7.67%
Install Breaker Failure Protection (2023-2024) - Sunnyside	-	-	73.50	216.20	92.07	-	92.07	-	**289.70**	-	-	467.17	389.32	621.01	-	-	-	**1,477.50**	1,187.80	410.01%	528.94	574.52%
Replace Data Alarm System Annunciators (2023) - Buchans	-	-	61.20	104.80	94.85	-	94.85	-	**166.00**	-	-	77.85	127.56	220.40	-	-	-	**425.81**	259.81	156.51%	125.54	132.36%
Replace Circuit Breaker Reclosing Controllers (2023-2024) - Hardwoods	-	-	81.60	149.60	100.12	-	100.12	-	**231.20**	-	-	43.84	129.77	132.17	-	106.37	-	**412.15**	180.95	78.27%	32.06	32.02%
Hydraulic Generation Refurbishment and Modernization (2022-2023)	-	2,970.60	3,788.90	-	250.81	-	250.81	-	**6,759.50**	-	2,664.56	4,556.23	250.36	296.92	-	-	-	**7,768.08**	1,008.58	14.92%	46.11	18.39%
Terminal Station R&M	-	3,111.90	6,109.70	-	32.30	-	32.30	-	**9,221.60**	-	2,168.73	5,679.46	156.17	112.19	-	-	-	**8,116.56**	(1,105.04)	-11.98%	79.89	247.37%
Diesel Genset Replacement Unit 2012 - L'Anse-Au-Loup	-	339.90	2,513.20	210.20	1,000.82	-	1,000.82	-	**3,063.30**	-	170.26	214.69	1,458.77	856.08	-	-	-	**2,699.81**	(363.49)	-11.87%	(144.74)	-14.46%
Refurbish Control Structure (2021–2025) – Ebbegunbaeg	3,236.82	3,238.30	3,470.10	2,781.60	1,258.71	4,952.20	6,210.91	-	**17,679.02**	2,196.44	4,301.54	3,923.59	5,494.12	5,398.46	-	2,042.43	-	**23,356.58**	5,677.56	32.11%	(812.45)	-13.08%
Replace Unit 2047 (2021-2023) – Ramea	307.71	2,010.80	118.30	-	730.07	-	730.07	-	**2,436.81**	49.04	216.05	1,096.33	1,226.50	538.16	-	41.28	-	**3,167.37**	730.56	29.98%	(191.91)	-26.29%
Diesel Genset Replacements (2021-2022)	2,560.60	286.20	-	-	84.47	-	84.47	-	**2,846.80**	1,503.79	1,036.26	382.20	140.99	283.53	-	-	-	**3,346.76**	499.96	17.56%	199.06	235.65%
Total	**6,105.13**	**11,957.70**	**19,894.30**	**26,979.89**	**13,456.79**	**149,344.97**	**162,801.76**	**34,376.93**	**248,658.92**	**3,749.27**	**10,557.41**	**18,640.73**	**33,829.29**	**167,276.38**	**34,376.93**	**9,630.66**	**4,297.40**	**282,358.08**	**33,699.16**		**4,474.62**	

[1] Numbers may not add due to rounding.

2025 Capital Expenditures By Investment Classification
General Plant
($000)[1]

	Capital Budget									Actual Expenditure and Forecast									Variance			
	A				B	C	D (B+C)	E	F (A+C+E)	G				H	I	J		K (G+H+I+J)	K-F		H-D	
																Carryover to 2026 and Beyond						
Project	2021	2022	2023	2024	Carryover to 2025	Original 2025	Revised 2025	2026 and Beyond	Total	2021	2022	2023	2024	2025	2026 and Beyond	Project Carryover	Multi-Year Cash Flow Reallocation	Total	Project		Annual	
Modify Office Buildings and Procure Furniture, Fixtures, & Equipment (2025)	-	-	-	-	-	178.50	178.50	-	**178.50**	-	-	-	-	214.47	-	-	-	**214.47**	35.97	20.15%	35.97	20.15%
Perform Accessbility Improvements (2025) - Hydro Place	-	-	-	-	-	742.09	742.09	-	**742.09**	-	-	-	-	189.89	-	552.20	-	**742.09**	-	0.00%	(552.20)	-74.41%
Perform Office Renovations (2025-2026) - Hydro Place	-	-	-	-	-	20.30	20.30	613.10	**633.40**	-	-	-	-	51.35	613.10	-	(31.05)	**633.40**	-	0.00%	31.05	152.96%
Perform Security Improvements (2025)	-	-	-	-	-	160.70	160.70	-	**160.70**	-	-	-	-	150.69	-	-	-	**150.69**	(10.01)	-6.23%	(10.01)	-6.23%
Purchase Personal Computers (2025)	-	-	-	-	-	575.60	575.60	-	**575.60**	-	-	-	-	613.13	-	-	-	**613.13**	37.53	6.52%	37.53	6.52%
Replace Peripheral Infrastructure (2025)	-	-	-	-	-	205.40	205.40	-	**205.40**	-	-	-	-	174.09	-	-	-	**174.09**	(31.31)	-15.24%	(31.31)	-15.24%
Upgrade Core OT Infrastructure (2025)	-	-	-	-	-	674.30	674.30	-	**674.30**	-	-	-	-	621.89	-	-	-	**621.89**	(52.41)	-7.77%	(52.41)	-7.77%
Update Cyber Security Infrastructure (2025)	-	-	-	-	-	115.60	115.60	-	**115.60**	-	-	-	-	68.18	-	-	-	**68.18**	(47.42)	-41.02%	(47.42)	-41.02%
Perform Software Upgrades and Minor Enhancements (2025)	-	-	-	-	-	808.70	808.70	-	**808.70**	-	-	-	-	565.46	-	-	-	**565.46**	(243.24)	-30.08%	(243.24)	-30.08%
Upgrade Energy Management System (2025-2026)	-	-	-	-	-	284.40	284.40	188.50	**472.90**	-	-	-	-	27.28	188.50	-	257.12	**472.90**	-	0.00%	(257.12)	-90.41%
Implement SCADA Points Application (2025-2026)	-	-	-	-	-	241.90	241.90	143.40	**385.30**	-	-	-	-	98.44	143.40	-	143.46	**385.30**	-	0.00%	(143.46)	-59.30%
Upgrade Work Protection Code Application (2025-2026)	-	-	-	-	-	452.00	452.00	256.60	**708.60**	-	-	-	-	592.21	256.60	-	(257.67)	**591.14**	(117.46)	-16.58%	140.21	31.02%
Install Electric Vehicle Chargers (2025-2026) - Hydro Sites	-	-	-	-	-	368.00	368.00	288.20	**656.20**	-	-	-	-	218.36	288.20	-	149.64	**656.20**	-	0.00%	(149.64)	-40.66%
Replace 48 V Battery Banks and Chargers (2025)	-	-	-	-	-	559.10	559.10	-	**559.10**	-	-	-	-	566.60	-	-	-	**566.60**	7.50	1.34%	7.50	1.34%
Replace Network Communications Equipment (2025)	-	-	-	-	-	413.20	413.20	-	**413.20**	-	-	-	-	246.05	-	-	-	**246.05**	(167.15)	-40.45%	(167.15)	-40.45%
Telecommunications In-Service Failures (2025)	-	-	-	-	-	94.10	94.10	-	**94.10**	-	-	-	-	76.99	-	-	-	**76.99**	(17.11)	-18.18%	(17.11)	-18.18%
Install CCTV Systems (2025)	-	-	-	-	-	440.10	440.10	-	**440.10**	-	-	-	-	353.69	-	-	-	**353.69**	(86.41)	-19.63%	(86.41)	-19.63%
Upgrade Remote Terminal Units (2025)	-	-	-	-	-	238.40	238.40	-	**238.40**	-	-	-	-	240.93	-	-	-	**240.93**	2.53	1.06%	2.53	1.06%
Refurbish Meteorological Stations (2025)	-	-	-	-	-	167.80	167.80	-	**167.80**	-	-	-	-	179.88	-	-	-	**179.88**	12.08	7.20%	12.08	7.20%
Purchase Mobile Devices (2025)	-	-	-	-	-	160.20	160.20	-	**160.20**	-	-	-	-	132.48	-	-	-	**132.48**	(27.72)	-17.31%	(27.72)	-17.31%
Replace Interconnect Microwave Radios (2025)	-	-	-	-	-	1,103.00	1,103.00	-	**1,103.00**	-	-	-	-	669.39	-	329.99	-	**999.39**	(103.61)	-9.39%	(433.61)	-39.31%
Replace GPS Clocks (2025-2026)	-	-	-	-	-	448.30	448.30	132.40	**580.70**	-	-	-	-	304.85	132.40	-	143.45	**580.70**	-	0.00%	(143.45)	-32.00%
Purchase Tools and Equipment (2025) - Telecontrol	-	-	-	-	-	45.30	45.30	-	**45.30**	-	-	-	-	46.03	-	-	-	**46.03**	0.73	1.61%	0.73	1.61%
Purchase Surveying Software and Equipment (2025)	-	-	-	-	-	316.40	316.40	-	**316.40**	-	-	-	-	286.67	-	-	-	**286.67**	(29.73)	-9.40%	(29.73)	-9.40%
Replace Light and Heavy-Duty Vehicles (2025-2027)	-	-	-	-	-	2,714.60	2,714.60	4,823.00	**7,537.60**	-	-	-	-	412.81	4,823.00	-	2,601.79	**7,837.60**	300.00	3.98%	(2,301.79)	-84.79%
Install Power Canal Public Safety Boom (2025) - Upper Salmon	-	-	-	-	-	463.80	463.80	-	**463.80**	-	-	-	-	268.63	-	-	-	**268.63**	(195.17)	-42.08%	(195.17)	-42.08%
Perform Level 2 Condition Assessment - Powerhouse Slope (2025) - Cat Arm	-	-	-	-	-	169.40	169.40	-	**169.40**	-	-	-	-	138.19	-	-	-	**138.19**	(31.21)	-18.43%	(31.21)	-18.43%
Purchase Tools and Equipment (2025) - Hydraulic Plants	-	-	-	-	-	154.90	154.90	-	**154.90**	-	-	-	-	191.90	-	-	-	**191.90**	37.00	23.88%	37.00	23.88%
Purchase Tools and Equipment (2025) - Thermal Plants	-	-	-	-	-	127.30	127.30	-	**127.30**	-	-	-	-	100.61	-	-	-	**100.61**	(26.69)	-20.96%	(26.69)	-20.96%
Purchase Tools and Equipment (2025) - Gas Turbines	-	-	-	-	-	46.60	46.60	-	**46.60**	-	-	-	-	30.38	-	-	-	**30.38**	(16.22)	-34.81%	(16.22)	-34.81%
Install Fire Protection - 230 kV Stations (2025-2026) - Come by Chance	-	-	-	-	-	51.70	51.70	534.50	**586.20**	-	-	-	-	26.57	534.50	-	25.13	**586.20**	-	0.00%	(25.13)	-48.61%
Replace Mobile Equipment (2025-2027)	-	-	-	-	-	1,973.60	1,973.60	2,674.00	**4,647.60**	-	-	-	-	344.44	2,674.00	-	2,212.07	**5,230.52**	582.92	12.54%	(1,629.16)	-82.55%
Webex Migration and Room Upgrade (2025)	-	-	-	-	-	181.04	181.04	-	**181.04**	-	-	-	-	-	-	-	-	**-**	(181.04)	-100.00%	(181.04)	-100.00%
Corporate PC Replacement (2025)	-	-	-	-	-	179.27	179.27	-	**179.27**	-	-	-	-	171.87	-	-	-	**171.87**	(7.40)	-4.13%	(7.40)	-4.13%
Update IS Cybersecurity Infrastructure (2025)	-	-	-	-	-	227.63	227.63	-	**227.63**	-	-	-	-	250.82	-	-	-	**250.82**	23.20	10.19%	23.20	10.19%
Replace Corporate Peripheral Infrastructure (2025)	-	-	-	-	-	154.66	154.66	-	**154.66**	-	-	-	-	125.74	-	-	-	**125.74**	(28.92)	-18.70%	(28.92)	-18.70%
Corporate Disaster Recovery Upgrade (2025)	-	-	-	-	-	120.26	120.26	-	**120.26**	-	-	-	-	22.80	-	-	-	**22.80**	(97.46)	-81.04%	(97.46)	-81.04%
Implement Electronic Tailboard Technology (2025)	-	-	-	-	-	250.80	250.80	-	**250.80**	-	-	-	-	6.43	-	244.37	-	**250.80**	-	0.00%	(244.37)	-97.44%
Implement Document Control Software for Major Projects (2025)[2]	-	-	-	-	-	170.00	170.00	-	**170.00**	-	-	-	-	-	-	-	-	**-**	(170.00)	-100.00%	(170.00)	-100.00%
Implement Automated Orchestrations (2025)	-	-	-	-	-	257.82	257.82	-	**257.82**	-	-	-	-	104.13	-	-	-	**104.13**	(153.69)	-59.61%	(153.69)	-59.61%
Migrate Legacy Applications (2025)	-	-	-	-	-	479.34	479.34	-	**479.34**	-	-	-	-	423.13	-	-	-	**423.13**	(56.21)	-11.73%	(56.21)	-11.73%
Procure Project Controls Management System (2025)	-	-	-	-	-	252.40	252.40	-	**252.40**	-	-	-	-	115.87	-	136.53	-	**252.40**	-	0.00%	(136.53)	-54.09%
Replacement of Information Systems (2025–2026)	-	-	-	-	-	1,518.61	1,518.61	195.89	**1,714.50**	-	-	-	-	8.32	195.89	-	1,510.30	**1,714.50**	0.00	0.00%	(1,510.30)	-99.45%
Procure Stop Logs Units 1–7 (2025) – Bay d'Espoir	-	-	-	-	-	740.00	740.00	-	**740.00**	-	-	-	-	728.58	-	-	-	**728.58**	(11.42)	-1.54%	(11.42)	-1.54%
Supply & Install Work Stations Levels 3 & 4 (2025) - Hydro Place	-	-	-	-	-	747.77	747.77	-	**747.77**	-	-	-	-	707.33	-	-	-	**707.33**	(40.43)	-5.41%	(40.43)	-5.41%
Nalcor Core IT (2024)	-	-	-	705.50	432.71	-	432.71	-	**705.50**	-	-	-	135.73	429.37	-	-	-	**565.10**	(140.40)	-19.90%	(3.34)	-0.77%
Nalcor Cyber Security (2024)	-	-	-	111.40	95.00	-	95.00	-	**111.40**	-	-	-	16.40	34.69	-	-	-	**51.10**	(60.30)	-54.13%	(60.31)	-63.48%
Purchase & Install Site Radio System (2024) - Holyrood	-	-	-	412.20	388.51	-	388.51	-	**412.20**	-	-	-	23.69	401.52	-	-	-	**425.21**	13.01	3.16%	13.01	3.35%
Replace Plant Lighting (2024–2025) – Holyrood	-	-	-	139.77	(1.50)	549.53	548.03	-	**689.30**	-	-	-	141.27	114.98	-	433.05	-	**689.30**	-	0.00%	(433.05)	-79.02%
Purchase Tools and Equipment Less than $50,000 (2025) - Central Region	-	-	-	-	-	477.70	477.70	-	**477.70**	-	-	-	-	545.78	-	-	-	**545.78**	68.08	14.25%	68.08	14.25%
Purchase Tools and Equipment Less than $50,000 (2025) - Labrador Region	-	-	-	-	0.00	283.82	283.82	-	**283.82**	-	-	-	-	366.98	-	-	-	**366.98**	83.16	29.30%	83.16	29.30%
Purchase Tools and Equipment Less than $50,000 (2025) - Northern Region	-	-	-	-	(0.00)	263.58	263.58	-	**263.58**	-	-	-	-	191.56	-	-	-	**191.56**	(72.02)	-27.32%	(72.02)	-27.32%
General Property Rehabilitation (2024) - Hydro Place	-	-	-	234.00	146.42	-	146.42	-	**234.00**	-	-	-	289.61	111.88	-	-	-	**401.48**	167.48	71.57%	(34.54)	-23.59%
Upgrade SCADA Network (2024)	-	-	-	402.30	109.39	-	109.39	-	**402.30**	-	-	-	571.67	272.00	-	-	-	**843.67**	441.37	109.71%	162.61	148.65%
Replace MDR8000 Microwave Radios (2024-2025)	-	-	-	953.50	747.27	500.30	1,247.57	-	**1,453.80**	-	-	-	283.32	1,140.86	-	-	-	**1,424.17**	(29.63)	-2.04%	(106.72)	-8.55%
Replace VHF Radio System (2024-2025)	-	-	-	1,261.60	1,133.04	290.60	1,423.64	-	**1,552.20**	-	-	-	128.56	1,380.45	-	349.17	-	**1,858.18**	305.98	19.71%	(43.19)	-3.03%
Replace Light- and Heavy-Duty Vehicles (2024-2026)	-	-	-	1,479.10	(99.69)	4,148.80	4,049.11	1,133.40	**6,761.30**	-	-	-	2,053.79	3,218.97	1,133.40	-	1,834.43	**8,240.59**	1,479.29	21.88%	(830.14)	-20.50%
Replace Powerhouse 1 Roof (2024-2025) - Bay d'Espoir	-	-	-	140.20	60.76	1,819.20	1,879.96	-	**1,959.40**	-	-	-	79.44	1,962.96	-	285.96	-	**2,328.37**	368.97	18.83%	83.01	4.42%
Replace Powerhouse 1 Air Conditioning Unit (2024-2025) - Bay d'Espoir	-	-	-	57.80	(2.02)	231.20	229.18	-	**289.00**	-	-	-	59.82	231.20	-	-	-	**291.02**	2.02	0.70%	2.02	0.88%
Refurbish Outbuilding and Powerhouse Building Envelopes (2024-2025) - Holyrood	-	-	-	156.20	81.38	1,039.40	1,120.78	-	**1,195.60**	-	-	-	74.82	1,218.10	-	-	-	**1,292.92**	97.32	8.14%	97.32	8.68%
Replace Mobile Equipment (2024-2025)	-	-	-	216.90	(347.90)	599.70	251.80	-	**816.60**	-	-	-	564.80	320.03	-	-	-	**884.83**	68.23	8.36%	68.23	27.10%
Purchase 50' Material Handler Aerial Device on Tracked Unit (2024-2026) - Happy Valley Goose Bay	-	-	-	24.00	1.55	841.80	843.35	7.10	**872.90**	-	-	-	22.45	652.63	7.10	-	114.46	**796.65**	(76.25)	-8.74%	(190.72)	-22.61%
Install Fire Protection in 230 kV Stations (2024–2025) - Voisey's Bay	-	-	-	53.80	30.87	599.00	629.87	-	**652.80**	-	-	-	22.93	481.44	-	-	-	**504.36**	(148.44)	-22.74%	(148.44)	-23.57%
Install Public EV Ultra-Fast Charger (2024–2025) – Conne River	-	-	-	219.99	212.26	242.57	454.83	-	**462.57**	-	-	-	7.74	232.87	-	221.96	-	**462.57**	-	0.00%	(221.96)	-48.80%
Refurbish Control Building (2024-2025) - Grandy Brook and Doyles	-	-	-	109.40	65.29	444.70	509.99	-	**554.10**	-	-	-	154.11	588.03	-	171.74	-	**913.88**	359.78	64.93%	78.04	15.30%
Nalcor HPCM Rollouts (2023)	-	-	234.38	-	314.50	-	314.50	-	**234.38**	-	-	36.32	11.03	93.95	-	-	-	**141.29**	(93.08)	-39.72%	(220.55)	-70.13%
Replace Light- and Heavy-Duty Vehicles (2023-2025)	-	-	1,308.10	2,584.60	755.36	673.30	1,428.66	-	**4,566.00**	-	-	2,573.20	564.14	2,305.86	-	-	-	**5,443.19**	877.19	19.21%	877.19	61.40%
Water System Condition Assessment and Upgrades (2023-2024) - Bay d'Espoir	-	-	161.00	504.90	732.82	-	732.82	-	**665.90**	-	-	91.16	504.22	791.65	-	-	-	**1,387.03**	721.13	108.29%	58.83	8.03%
Upgrade Water and Fire Suppression Systems (2023-2024) - Bishop's Falls	-	-	353.70	2,886.30	5,073.68	-	5,073.68	-	**3,240.00**	-	-	316.19	410.13	3,494.13	-	1,579.55	-	**5,800.00**	2,560.00	79.01%	(1,579.55)	-31.13%
Install Ultra-Fast DC Electric Vehicle Chargers (2023-2025)	-	-	62.50	1,766.00	1,497.11	231.30	1,728.41	-	**2,059.80**	-	-	11.24	1,040.15	1,453.38	-	275.04	-	**2,779.80**	720.00	34.95%	(275.04)	-15.91%
																-	-	**-**				
Total	**-**	**-**	**2,119.68**	**14,419.46**	**11,426.81**	**33,031.39**	**44,458.20**	**10,990.09**	**60,560.62**	**-**	**-**	**3,028.09**	**7,159.81**	**32,902.81**	**10,990.09**	**4,579.57**	**8,703.14**	**67,363.50**	**6,802.89**		**(11,555.40)**	

[1] Numbers may not add due to rounding.

[2] The Document Control System project was determined to be a cloud-based solution that doesn't qualify for capitalization under IFRS; as a result, the capital expenditure on this project was $nil for this report. Its costs were included in the Cloud Cost Deferral, as approved in Board Order P.U. 1(2026).

2025 Capital Expenditures By Investment Classification
System Growth
($000)[1]

	Capital Budget							Actual Expenditure and Forecast								Variance		
	A				B	C	D (B+C)	E	F (A+C+E)	G				H	I	J		K (G+H+I+J)	K-F		H-D	
																Carryover to 2026 and Beyond						
Project	2021	2022	2023	2024	Carryover to 2025	Original 2025	Revised 2025	2026 and Beyond	Total	2021	2022	2023	2024	2025	2026 and Beyond	Project Carryover	Multi-Year Cash Flow Reallocation	Total	Project		Annual	
Additions for Load - Distribution Systems (2024-2027) - Catheright	-	-	-	19.72	19.72	0.89	20.61	487.22	**507.83**	-	-	-	-	13.86	487.22	-	6.75	**507.83**	-	0.00%	(6.75)	-32.76%
Additions for Load - Distribution Systems (2026-2029) - Main Brook	-	-	-	326.73	(131.79)	26.29	(105.49)	-	**351.02**	-	-	-	458.51	25.01	-	-	-	**483.52**	130.50	36.97%	130.50	-123.71%
Additions for Load Growth - Unit 2065 Replacement and Fuel Storage Upgrades (2024–2027) - Rigolet	-	-	-	50.07	28.20	226.36	254.56	3,152.79	**3,429.22**	-	-	-	21.87	1,831.30	3,152.79	-	(1,162.08)	**3,843.88**	414.66	12.09%	1,576.74	619.41%
Additions for Load Growth - Upgrade Transformer Capacity (2023-2028) - Jean Lake Terminal Station	-	-	580.00	-	(68.80)	6,459.60	6,390.80	3,960.10	**10,999.70**	-	-	52.02	596.75	1,807.86	3,960.10	-	4,582.98	**10,999.70**	-	0.00%	(4,582.94)	-71.71%
Additions for Load (2022) – Distribution System – Mary's Harbour Voltage Conversion	-	307.80	51.30	-	36.65	-	36.65	-	**359.10**	-	122.97	38.62	12.76	8.77	-	-	-	**183.12**	(175.98)	-49.01%	(27.88)	-76.06%
Additions for Load - Wabush Substation Upgrades (2021–2025)	1,186.70	6,253.00	-	2,799.90	2,206.67	514.50	2,721.17	-	**10,694.10**	300.60	2,299.38	4,384.48	1,075.71	935.10	-	-	-	**8,995.26**	(1,698.84)	-15.89%	(1,786.07)	-65.64%
Wabush Terminal Station Upgrades (2021–2024)	2,301.72	4,935.50	1,632.90	3,808.00	883.44	-	883.44	-	**12,678.12**	794.01	1,843.19	7,992.32	4,607.69	1,680.20	-	254.72	-	**17,172.12**	4,494.00	35.45%	796.76	90.19%
Total	**3,488.42**	**11,496.30**	**2,264.20**	**6,944.42**	**2,974.09**	**7,227.64**	**10,201.73**	**7,600.11**	**39,021.08**	**1,094.61**	**4,265.54**	**12,467.43**	**6,773.28**	**6,302.09**	**7,600.11**	**254.72**	**3,427.65**	**42,185.44**	**3,164.35**		**(3,899.04)**	

[1] Numbers may not add due to rounding.

2025 Capital Expenditures By Investment Classification
Access
($000)[1]

Project	A				Capital Budget			G				Actual Expenditure and Forecast		J		K (G+H+I+J)	Variance		
	2021	2022	2023	2024	Carryover to 2025	Original 2025	Revised 2025	2026 and Beyond	Total	2021	2022	2023	2024	2025	2026 and Beyond	Carryover to 2026 and Beyond: Project Carryover	Carryover to 2026 and Beyond: Multi-Year Cash Flow Reallocation	Total	K-F: Project	H-D: Annual	
	B	C	D (B+C)	E	F (A+C+E)									H	I				K-F	H-D	
Interconnection and Integration of the Puffin Wind Inc. Renewable Energy Project	-	-	-	-	-	344.20	344.20	933.80	**1,278.00**	-	-	-	-	215.61	933.80	-	128.59	**1,278.00**	-	(128.59)	-37.36%
Provide Service Extensions (2025)	-	-	-	-	-	4,662.50	4,662.50	-	**4,662.50**	-	-	-	-	5,386.06	-	-	-	**5,386.06**	723.56	723.56	15.52%
Total	**-**	**-**	**-**	**-**	**-**	**5,006.70**	**5,006.70**	**933.80**	**5,940.50**	**-**	**-**	**-**	**-**	**5,601.67**	**933.80**	**-**	**128.59**	**6,664.06**	**723.56**	**594.97**	

[1] Numbers may not add due to rounding.

2025 Capital Expenditures By Investment Classification
Service Enhancement
($000)[1]

	Capital Budget									Actual Expenditure and Forecast									Variance			
	A				B	C	D (B+C)	E	F (A+C+E)	G				H	I	J		K (G+H+I+J)	K-F		H-D	
																Carryover to 2026 and Beyond						
Project	2021	2022	2023	2024	Carryover to 2025	Original 2025	Revised 2025	2026 and Beyond	Total	2021	2022	2023	2024	2025	2026 and Beyond	Project Carryover	Multi-Year Cash Flow Reallocation	Total	Project		Annual	
Remove Safety Hazards (2025)	-	-	-	-	-	203.30	203.30	-	**203.30**	-	-	-	-	340.26	-	-	-	**340.26**	136.96	67.37%	136.96	67.37%
Install Dynamic Line Rating (2025–2026) – TL201	-	-	-	-	-	2.20	2.20	593.30	**595.50**	-	-	-	-	-	593.30	-	2.20	**595.50**	-	0.00%	(2.20)	-100.00%
Perform Minor Telecommunications Enhancements (2025)	-	-	-	-	-	99.80	99.80	-	**99.80**	-	-	-	-	96.90	-	-	-	**96.90**	(2.90)	-2.90%	(2.90)	-2.90%
Upgrade Worst-Performing Distribution Feeders (2025-2027)	-	-	-	-	-	2,678.90	2,678.90	6,207.20	**8,886.10**	-	-	-	-	223.01	6,207.20	-	2,455.89	**8,886.10**	-	0.00%	(2,455.89)	-91.68%
Install Mid Span Structures - TL220 (2025-2026)	-	-	-	-	-	881.30	881.30	229.30	**1,110.60**	-	-	-	-	214.64	229.30	-	666.66	**1,110.60**	-	0.00%	(666.66)	-75.64%
Install Additional Fuel Tank (2025) – Ramea	-	-	-	-	-	232.50	232.50	-	**232.50**	-	-	-	-	179.11	-	-	-	**179.11**	(53.39)	-22.96%	(53.39)	-22.96%
Construct Maintenance Platform (2024-2025) - Holyrood Gas Turbine	-	-	-	130.50	64.72	228.70	293.42	-	**359.20**	-	-	-	65.78	339.22	-	-	-	**405.00**	45.80	12.75%	45.80	15.61%
Upgrade Instrumentation (2024-2025) - Hardwoods Gas Turbine	-	-	-	60.90	(34.88)	157.20	122.32	-	**218.10**	-	-	-	95.78	360.48	-	96.83	-	**553.09**	334.99	153.59%	238.16	194.71%
Upgrade Worst-Performing Distribution Feeders (2024-2025)	-	-	-	1,064.30	756.94	2,227.40	2,984.34	-	**3,291.70**	-	-	-	307.36	5,198.35	-	-	-	**5,505.71**	2,214.01	67.26%	2,214.01	74.19%
Automate Bulk Metering (2024-2026)	-	-	-	302.60	131.14	214.40	345.54	289.70	**806.70**	-	-	-	171.46	221.97	289.70	-	123.57	**806.70**	-	0.00%	(123.57)	-35.76%
Purchase Spare Generator Step-Up Transformer (2023-2028)	-	-	39.60	1,298.90	1,269.92	1,822.10	3,092.02	9,163.40	**12,324.00**	-	-	17.53	51.05	793.21	9,163.40	-	2,298.81	**12,324.00**	-	0.00%	(2,298.81)	-74.35%
Replace Metering System (2022-2024)	-	515.60	4,365.60	994.60	189.03	-	189.03	-	**5,875.80**	-	2,264.44	1,993.35	3,648.98	1,388.70	-	-	-	**9,295.47**	3,419.67	58.20%	1,199.67	634.66%
Total	**-**	**515.60**	**4,405.20**	**3,851.80**	**2,376.87**	**8,747.80**	**11,124.67**	**16,482.90**	**34,003.30**	**-**	**2,264.44**	**2,010.88**	**4,340.41**	**9,355.85**	**16,482.90**	**96.83**	**5,547.13**	**40,098.44**	**6,095.14**		**(1,768.82)**	

[1] Numbers may not add due to rounding.

2025 Capital Expenditures By Investment Classification
Mandatory
($000)[1]

	Capital Budget								Actual Expenditure and Forecast									Variance		
	A				B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F	H-D	
Project	2021	2022	2023	2024	Carryover to 2025	Original 2025	Revised 2025	2026 and Beyond	Total	2021	2022	2023	2024	2025	2026 and Beyond	Carryover to 2026 and Beyond: Project Carryover	Carryover to 2026 and Beyond: Multi-Year Cash Flow Reallocation	Total	Project	Annual
Inspect Fuel Tanks (2025) - Holyrood	-	-	-	-	-	608.00	608.00	-	**608.00**	-	-	-	-	575.51	-	-	-	**575.51**	(32.49)	(32.49)
Purchase Meters and Metering Equipment (2025-2026)	-	-	-	-	-	446.20	446.20	278.40	**724.60**	-	-	-	-	583.90	278.40	-	(137.70)	**724.60**	-	137.70
Upgrade Station Lighting (2024-2025) - Bottom Waters, Deer Lake, Doyles, Indian River, and Western Avalon Terminal Stations	-	-	-	91.60	21.46	429.00	450.46	-	**520.60**	-	-	-	70.14	609.99	-	-	-	**680.13**	159.53	159.53
Replace Terminal Station Lighting (2023-2024)	-	-	323.30	594.10	310.63	-	310.63	-	**917.40**	-	-	388.68	717.04	326.43	-	-	-	**1,432.15**	514.75	15.80
Total	**-**	**-**	**323.30**	**685.70**	**332.08**	**1,483.20**	**1,815.28**	**278.40**	**2,770.60**	**-**	**-**	**388.68**	**787.19**	**2,095.82**	**278.40**	**-**	**(137.70)**	**3,412.38**	**641.78**	**280.53**

[1] Numbers may not add due to rounding.

Appendix B

Program Scope Details 2025



Remove Safety Hazards (2025)

In Board Order No. P.U. 38(2010) related to Hydro's 2011 CBA, the Board directed Hydro to include in its annual report on capital expenditures an explanation of each scope of work that was undertaken for the Remove Safety Hazards program, setting out the safety hazard that was identified, the location, the steps taken to address the issue, and the amount of the expenditure. Table B-1 outlines the work scopes undertaken in 2025.

Total Approved Budget: **$203,300**

Total Expenditure: **$340,256**

Table B-1: Remove Safety Hazards[1]

Program Work Scope	Expenditure[2] ($000)	Safety Hazard Identified	Work Scope Detail
Install Security Lift Gates with Card Access at the Main Entrance and Marine Terminal – Holyrood TGS	168.5	Installation of lift gates at the main entrance to the Holyrood TGS and at the Marine Terminal will ensure that only authorized personnel and vehicles enter the facilities, thus maintaining the safety and security of the site. The current lack of a lift gate at the Marine Terminal poses a marine security risk with Transport Canada.	Installation of the new lift gates with card access at the main entrance and marine terminal commenced in 2025 and will be completed as part of the 2026 Remove Safety Hazards program.
Install Hydrogen Tube Trailer Station – Holyrood TGS	57.3	Hydrogen gas, utilized at the Holyrood TGS for cooling the three generators, is currently supplied through bulk packs placed in a storage shed on the east side of the powerhouse; a forklift and pallet jack are used to replace them as they are consumed for generator cooling. The storage shed is original to the facility and has several safety and operational issues. Transitioning to a tube trailer-based hydrogen supply system would address safety and operational challenges with the existing storage shed, minimize safety risk to staff during hydrogen handling, and improve efficiency by reducing the frequency of bulk pack replacements.	Installation of a hydrogen tube trailer station commenced in 2025 and will be completed as part of the 2026 Remove Safety Hazards program.

[1] Details are provided for program scopes greater than $50,000.
[2] Numbers may not add due to rounding.

Program Work Scope	Expenditure[2] ($000)	Safety Hazard Identified	Work Scope Detail
Work Scopes Under $50,000	114.5		

Perform Software Upgrades and Minor Enhancements (2025)

In its 2025 CBA, Hydro committed to providing a summary of unforeseen work executed under the Perform Software Upgrades and Minor Enhancements (2025) program in this report. All unforeseen scopes of work undertaken in the 2025 program were individually under $50,000, with a total expenditure of $33,300.

Total Approved Budget: **$808,700**

Total Expenditure: **$565,458**

Terminal Station In-Service Failures (2025)

Hydro has provided a summary of the scopes of work undertaken under the Terminal Station In-Service Failures program that individually exceed $750,000. All scopes of work undertaken in the 2025 program were individually under $750,000.

Total Approved Budget: **$2,500,000**

Total Expenditure: **$516,005**

Hydraulic In-Service Failures (2025)

Hydro has provided a summary of scopes of work undertaken under the Hydraulic In-Service Failures program that individually exceed $750,000. Table B-2 outlines 2025 expenditures under this program.

Total Approved Budget: **$2,000,000**

Total Expenditure: **$2,723,243**

Table B-2: Hydraulic In-Service Failures

Program Work Scope	Expenditure[3] ($000)	Failure Identified	Scope Description
Unit 1 Turbine Runner Replacement – Cat Arm	1,883.7[4]	During an annual unit outage in late 2023, Hydro executed field inspections and reviews of turbine components in Cat Arm in consultation with the turbine OEM. Inspections revealed that the runner was at the end of its life cycle and needed to be replaced, and had experienced progressive wear and damage, including accelerated cavitation and a piece broken away on the leading edge. As the OEM was not on-site to complete the inspection, Hydro engaged a third-party consultant to conduct additional assessments in person during the annual unit outage the following year. Based on these findings, the consultant recommended replacement of the Unit 1 runner within 12 months to maintain the safe and reliable operation of Cat Arm Unit 1.	As part of the 2024 Hydraulic In-Service Failures program, the OEM completed a constructability review for the replacement of the Unit 1 turbine runner. Work planning commenced in 2024, and materials were procured. In 2025, the runner was replaced with the available spare runner from Hydro's inventory and the generating unit was returned to service.
Work Scopes Under $750,000	839.5		

Thermal In-Service Failures (2025)

Hydro has provided a summary of the scopes of work undertaken under the Thermal In-Service Failures program that individually exceed $750,000. Table B-3 outlines 2025 expenditures under this program.

Total Approved Budget: **$3,900,000**

Total Expenditure: **$3,058,741**

[3] Numbers may not add due to rounding.
[4] This work scope incurred $466,900 in 2024 for a total 2024–2025 cost of $2,350,600.

Table B-3: Thermal In-Service Failures

Program Work Scope	Expenditure[5] ($000)	Failure Identified	Scope Description
Replace Sanitary Sewer Distribution Piping System and Overhaul Lift Station – Holyrood TGS	502.2[6]	The sanitary sewer distribution piping system and lift station at the Holyrood TGS was installed in 1969. Numerous leaks have been experienced in the piping system and repair efforts have been exhausted as leaks continue to return. Blockages in the cast iron piping system have been difficult to clear, leading to sinks backing up in the washrooms and kitchen areas. Chemical cleaning necessary to remove the blockages results in leaks along the main header that runs above high-traffic areas in the powerhouse, posing a safety and health risk to employees. Replacement of the cast iron piping and supports was required to ensure safe and reliable operation of the system. In addition, an inspection of the lift station completed by an authorized service provider determined that the system requires an overhaul.	Work planning for the replacement of the sanitary sewer distribution system commenced as part of the 2023 Thermal In-Service Failures Program. A section of the sanitary sewer piping system was replaced as part of the 2024 Thermal In-Service Failures Program. In 2025, the remaining sections of the piping system were replaced and the lift station was overhauled.
Work Scopes Under $750,000	2,556.5		

Gas Turbine In-Service Failures (2025)

Hydro has provided a summary of scopes of work undertaken under the Gas Turbine Generation In-Service Failures program that individually exceed $750,000. Table B-4 outlines 2025 expenditures under this program.

Total Approved Budget: **$500,000**

Total Expenditure: **$1,868,190**

[5] Numbers may not add due to rounding.
[6] While the work scope in 2025 was less than $750,000, this work scope incurred $30,600 in 2023 and $574,800 in 2024 for a total 2023–2025 cost of $1,107,600.

Table B-4: Gas Turbine Generation In-Service Failures

Program Work Scope	Expenditure[7] ($000)	Failure Identified	Scope Description
Overhaul Engine 2024020 – Hardwoods Gas Turbine	1,522.6	A borescope inspection of Engine 2024020, installed in End A at the Hardwoods Gas Turbine, revealed coating loss on the compressor blades, oil leakage from the No. 7 bearing housing, damage to various high-pressure turbine nozzle guide vanes, and cracked high-pressure turbine nozzle guide vane seal strip channels.[8] This level of deterioration triggered the need for engine overhaul at the service provider's facility.	Engine 2024020 was removed from service and sent for overhaul to the service provider's facility. An available spare engine was installed and placed in service to restore full generation capacity for the Hardwoods Gas Turbine. Following disassembly and inspection, deterioration of several additional engine components was discovered. Engine overhaul commenced and was substantially completed in 2025; remaining work continues as part of the 2026 Gas Turbine In-Service Failures program.[9]
Work Scopes Under $750,000	345.6		

Diesel In-Service Failures (2025)

Hydro has provided a summary of scopes of work undertaken under the Diesel In-Service Failures program that individually exceed $750,000. All scopes of work undertaken in the 2025 program were individually under $750,000.

Total Approved Budget: **$800,000**

Total Expenditure: **$758,430**

[7] Numbers may not add due to rounding.

[8] The detachment of any pieces from the nozzle guide vanes during unit operation could result in damage to downstream gas or power turbine components, likely leading to engine failure and a requirement for extensive refurbishment.

[9] Following refurbishment and shop testing, the overhauled engine will be returned to serve as a spare engine for both Hardwoods and Stephenville Gas Turbines. Return of the engine is expected in the second quarter of 2026.

Telecommunications In-Service Failures (2025)

Hydro has provided a summary of scopes of work undertaken under the Telecommunications In-Service Failures program that individually exceed $750,000. All scopes of work undertaken in the 2025 program were individually under $750,000.

Total Approved Budget: **$94,100**
Total Expenditure: **$76,991**

Transmission In-Service Failures (2025)

Hydro has provided a summary of scopes of work undertaken under the Transmission In-Service Failures program that individually exceed $750,000. All scopes of work undertaken in the 2025 program were individually under $750,000.

Total Approved Budget: **$184,300**
Total Expenditure: **$162,325**

Perform Boiler Condition Assessment and Miscellaneous Upgrades (2025) – Holyrood

The primary work executed under this program was to perform a Level 2 Condition Assessment on the internal components of the boilers and associated external high-energy piping to identify required refurbishment work. The 2025 program also included completion of the miscellaneous refurbishment work identified during 2024 and 2025 condition assessments to support safe and reliable operation through the 2025–2026 winter operating season.

For refurbishment work scopes identified and executed in 2025 under this program that were material in dollar value and met capitalization criteria, Hydro proposed to implement and communicate these items to the Board of Commissioners of Public Utilities in this 2025 Capital Expenditures and Carryover Report. The boiler condition assessments were completed on Units 1, 2, and 3 in 2025 and Table B-5 provides a summary of the refurbishment work identified and executed in 2025.

Total Approved Budget: **$4,905,800**
Total Expenditure: **$8,085,678**

Table B-5: Perform Boiler Condition Assessment and Miscellaneous Upgrades (2025) – Holyrood

Scope Title	Expenditure ($000)[10]	Scope of Work and Justification[11]
Unit 1 Secondary Super Heater Outlet ("SSHO") No.6 Header Replacement	2,562.2	The SSHO header is a boiler component that collects high-temperature and pressure steam from the secondary superheater tubes and directs it to the main steam system and steam turbine. It operates under high temperature and pressure conditions during normal plant operation, resulting in material deterioration over time. Maintaining the integrity of this boiler component is important to ensure the continued safe and reliable operation of the generating unit. During the 2024 annual Unit 1 outage, non-destructive testing ("NDT") completed on the SSHO revealed indications around the header outlet nozzles, and it was recommended that refurbishment work be completed during the next annual unit outage. The SSHO No.6 header, which had the most deterioration, was replaced during the annual Unit 1 outage in 2025.
Units 1 and 3 Gas Outlet Duct and Expansion Joint Refurbishment	2,198.0	When the boiler exhaust gas temperature falls below the sulphuric acid dew point during unit operation, sulphuric acid condensation forms and corrodes the internal surface of the outlet duct to the boiler stack. In addition, particulate material in the exhaust gases erodes the duct internal lining and expansion joints, causing leaks during operation. In 2025, the boiler gas outlet ducts and expansion joints were refurbished on Units 1 and 3 to ensure safe and reliable operation when the units were returned to service.
Units 1, 2 and 3 High Pressure ("HP") Feedwater Heater #6 Overhauls	756.3	HP feedwater heaters utilize high pressure steam extracted from the turbine steam cycle to preheat the boiler feedwater before it is returned to the boiler, thereby optimizing the generating unit thermal efficiency. During the 2025 operating season, leaking tubes were suspected on Unit 1 - HP Heater #6 and Unit 2 - HP Heater #6. Leaking tubes were also suspected on Unit 3 - HP Heater No.6, with that heater removed from service to prevent water induction into the turbine due to the leakage rate. The HP heaters were opened for Level 2 Condition Assessments during the 2025 annual unit outages and leaking tubes were discovered on all three HP Heaters as suspected. Leaking tubes were plugged in Unit 1 – HP Heater No.6 and Unit 2 - HP Heater No. 6, and those heaters returned to service in 2025. The number of leaking tubes in Unit 3 – HP Heater No. 6 exceeded the amount recommended for plugging by the OEM, and

[10] These expenditures include both the condition assessment and the refurbishment costs associated with each scope of work. The refurbishment costs were not tracked separately from the condition assessment costs.
[11] Details are provided for program scopes greater than $50,000.

Scope Title	Expenditure ($000)[10]	Scope of Work and Justification[11]
		the heater was removed from service for replacement in a future year.[12]
Unit 3 Rotary Air Heater Cold End Baskets Replacement	570.6	The Holyrood Unit 3 rotary air heaters are heat recovery systems that extract heat from the boiler exhaust gases to preheat the incoming boiler combustion air before it enters the boiler. Preheating the combustion air reduces the energy required to bring it up to combustion temperature, leading to fuel savings and increased thermal efficiency. During the 2024 outage season, the rotary air heater cold end baskets were showing signs of deterioration and were recommended by the boiler OEM to be replaced during the next annual outage to Unit 3. The air heater cold end baskets and steel support structure that had extensive corrosion were replaced in 2025 during the annual Unit 3 outage.
Units 1 and 2 Front Wall Downcomer and Header Expansion Joints Refurbishment	503.7	During boiler operation, downcomers and headers are subjected to temperature differentials, causing them to expand and contract during operation, which is accommodated by expansion joints. During the 2025 annual outages for Units 1 and 2, expansion joints for the front wall downcomer were cleaned, inspected and refurbished or replaced, as required.
Unit 1 High Pressure ("HP") Feedwater Heater No.4 Replacement	288.5	During the 2024 operating season, leaking tubes were discovered on Unit 1 – HP Feedwater Heater #4 and the heater was removed from service to prevent water induction into the turbine. The heater will require replacement due to its deteriorated condition. In 2025, engineering work and tendering was completed for the replacement heater, the heater supply contract was awarded, and other materials were procured in preparation for installation in 2026 during the annual Unit 1 outage.
Work Scopes Under $50,000	82.0	

[12] The OEM recommends that up to 2% of leaking heater tubes can be plugged without adversely affecting the thermal performance of the heater.

Appendix C

Existing IS Project Scope Details 2025



Background

As at January 1, 2025, the date of amalgamation, there were IS projects that were ongoing and had been approved and initiated by Nalcor, for which contracts with vendors had been signed and therefore procurement commitments had been made. As a result of amalgamation, Hydro is bound by contractual agreements made by Nalcor prior to January 1, 2025 and proceeded with the execution of capital work related to these projects accordingly.

Hydro noted in its Amalgamation Report that it would provide the Board with the scope of the work and the justification of each project with external procurement commitments, in the form of capital proposals for these projects, as part of a future application which would propose the transfer of these assets to Hydro's regulated business segment. This information and associated proposals related to the following projects has been provided within the evidence for Hydro's Application to Transfer Existing Information Systems Assets, currently before the Board:[1]

- Implement Accounts Payable Automation Software
- Perform Software Upgrades and Enhancements (2024-2025)
- Renew Microsoft Enterprise Agreements (2025-2028)

Upon in-service, Hydro has proposed to include these assets in rate base through the applicable CBA process, consistent with past regulatory practice. In the interim, these expenditures are being incurred within Hydro's non-regulated business segment, and in line with the commitment made in Hydro's Amalgamation Report, Hydro has included them within its 2025 Capital Expenditures and Carryover Report.

Implement Accounts Payable Automation Software

Variance Type	Budget ($000)	Expenditures and Forecast ($000)	Variance ($000)	Variance (%)
Annual	1372.1	771.8	(600.3)	(43.8)
Project	1,421.6	1421.6	-	-

[1] "Recovery of Costs Associated with Information Systems Assets," Newfoundland and Labrador Hydro, April 1, 2026.

This project commenced in 2022, and was planned for implementation in 2025. However, the project was carried over into 2026 to accommodate a required software upgrade. The project scope is to implement an automated solution for accounts payable ("AP") activities which will be integrated with Hydro's Enterprise Resource Planning ("ERP") system.[2] Hydro currently relies on manual processes for the administration and approval of AP activities as its current ERP system does not possess the functionality to automatically capture and process invoice data or to support an integrated workflow for invoice tracking and approval. The current AP processes present significant and unacceptable risks to Hydro's business environment. The proposed solution will ensure accurate, efficient execution of Hydro's AP activities to reduce the risk of fraudulent activity and financial losses, including interest charges, fees and penalties, and missed early-payment discounts due to untimely payments.[3]

Perform Software Upgrades and Minor Enhancements - Information Technology (2024–2026)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)	Variance (%)
Annual	297.5	531.3	233.8	178.5
Program	1,190.4	1,055.7	(134.7)	(11.3)

This program commenced in 2024, and has carried over into 2026. Two software upgrades under this program were carried over due to vendor software issues and insufficient internal resource capacity to complete the work within the budgeted timeframe.

Beginning in 2025, Hydro created a separate single-year program for capital expenditures related to Information Technology ("IT") assets, recognizing the distinct nature and purpose of IT software as compared to Operational Technology ("OT") software, used specifically for grid operations. The program scope includes planned upgrades and enhancements, and allows Hydro to respond to additional unforeseen urgent requests for system improvements. Planned scopes in 2025 include upgrades to Hydro's security management system, geographic information system, and document control.[4] The program originally included a scope related to the Collaborative Creation Systems Upgrade; however, it

[2] Hydro's current ERP system is JD Edwards ("JDE").
[3] For further project information, please refer to Appendix A to the "Recovery of Costs Associated with Information Systems Assets," Newfoundland and Labrador Hydro, April 1, 2026.
[4] For further project information, please refer to Appendix B to the "Recovery of Costs Associated with Information Systems Assets," Newfoundland and Labrador Hydro, April 1, 2026.

has been determined that this SharePoint upgrade will be cloud-based software and as a result, the upgrade will not be a capital expenditure.[5] Hydro will be submitting an application for inclusion of the implementation costs within the Cloud Cost Deferral Account in Q2 2026.

Renew Microsoft Enterprise Agreement (2025–2028)

Variance Type	Budget ($000)	Expenditures ($000)	Variance ($000)	Variance (%)
Annual	426.6	395.6	(31.0)	(7.2)
Project	1,270.2	1,270.2	-	-

This four-year project (2025-2028) commenced in 2025; the project scope includes renewal of the agreement for Microsoft Enterprise. The Enterprise Agreement for the continued installation and upgrades of Microsoft Operating Systems and software expired in 2025, and was renewed for an additional 3-year term. Hydro utilizes Microsoft Systems and software for an array of business needs, and it is essential these systems remain secure, updated, and available.[6]

[6] For further project information, please refer to Appendix C of the "Recovery of Costs Associated with Information Systems Assets," Newfoundland and Labrador Hydro, April 1, 2026.

2025 Capital Expenditures By Investment Classification
Existing Information Systems
($000) [1]

	Actual Expenditure and Forecast														Variance				
	A				Capital Budget				G				H	I	J		K(G+H+I+J)	K-F		H-D
Project	2021	2022	2023	2024	B Carryover to 2025	C Original 2025	D (B+C) Revised 2025	E 2026 and Beyond	F (A+C+E) Total	2021	2022	2023	2024	2025	2026 and Beyond	Carryover to 2026 and Beyond: Project Carryover	Carryover to 2026 and Beyond: Multi-Year Cash Flow Reallocation	Total	Project	Annual
Renew Microsoft Enterprise Agreement (2025 – 2028)	-	-	-	-	-	426.64	426.64	853.29	**1,279.93**	-	-	-	-	395.60	853.29		31.04	**1,279.93**	(0.00)	(31.04)
Implement Accounts Payable Automation Software	-	-	-	49.50	-	1,372.09	1,372.09	-	**1,421.59**	-	-	-	49.50	771.80	-	600.29	-	**1,421.59**	-	(600.29)
Sharepoint Upgrade[2]	-	-	-	-	-	386.42	386.42	-	**386.42**	-	-	-	-	4.13	-	382.29	-	**386.42**	-	(382.29)
Perform Software Upgrades and Minor Enhancements - Information Technology (2024-2026)	-	-	-	892.49	466.50	297.95	764.45	-	**1,190.44**	-	-	-	425.99	531.31	-	98.41	-	**1,055.72**	(134.72)	(233.14)
																-				
Total	**-**	**-**	**-**	**941.99**	**466.50**	**2,483.10**	**2,949.60**	**853.29**	**4,278.38**	**-**	**-**	**-**	**475.49**	**1,702.85**	**853.29**	**1,080.99**	**31.04**	**4,143.66**	**(134.72)**	**(1,246.76)**

[1] Numbers may not add due to rounding.
[2] In 2026, the Sharepoint Upgrade project solution was determined to be a cloud-based solution and, as a result, doesn't qualify for Capitalization under IFRS. Hydro will be submitting a separate application to have this project implementation costs included in the Cloud Cost Deferral.

Schedule 6

2025 Average Rate Base



2027 Capital Budget Application

2025 Average Rate Base



Table 1: Computation of Average Rate Base for the Year Ended December 31, 2025 ($000)[1]

	2025
Capital Assets – Return 4	3,303,243
Work in Progress[2]	89,941
	3,393,184
Deduct:	
Accumulated Depreciation – Return 6[3,4]	(827,789)
Contributions in Aid of Construction – Return 7[2,4]	(66,639)
Total Capital Assets[4]	2,498,756
Deduct Items Excluded from Rate Base:	
Work in Progress[2]	(89,941)
Asset Retirement Obligations (Net of Amortization)	(13,422)
Net Capital Assets	2,395,393
Net Capital Assets, Previous Year	2,268,064
Unadjusted Average Capital Assets	2,331,729
Deduct:	
Average Net Capital Assets Excluded from Rate Base	(7,631)
Average Capital Assets	**2,324,098**
Working Capital Allowance – Return 8	**1,229**
Fuel Inventory – Return 10	**57,161**
Supplies Inventory – Return 10	**46,725**
Average Deferred Charges for Rate Base – Return 11	**57,569**
Average Rate Base at Year End – Return 12	**2,486,782**

[1] The 2025 Average Rate Base is an excerpt of Return 3. For further information, please refer to "2025 Annual Return," Newfoundland and Labrador Hydro, April 30, 2026, Return 3.
[2] Contributions of $3.9 million related to Capital Assets not in service have been net in Work in Progress. In addition, insurance proceeds of $1.0 million related to Capital Assets not in service have been net in Work in Progress.
[3] Accumulated Depreciation is net of the Retirement Asset Pool and Removal Provision. For further details, please refer to "2025 Annual Return," Newfoundland and Labrador Hydro, April 30, 2026, Return 6.
[4] As per Board Order No. P.U. 33(2023), electric vehicle chargers were excluded from Capital Assets and included in Deferred Charges in Return 11.

Schedule 7

Capital Programs and Projects



Programs

Over $750,000



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Wood Pole Line Management

(2027)

newfoundland labrador hydro



Wood Pole Line Management (2027)

Location: Various Locations

Investment Classification: Renewal

Asset Category: Transmission

Estimated Cost: $7,998,000

Executive Summary

The Wood Pole Line Management ("WPLM") Program is an annual program that promotes the early detection and replacement of deteriorated poles and other line components to extend the expected useful life of the poles and Newfoundland and Labrador Hydro's ("Hydro") wood pole transmission lines. This program is a least-cost strategy for wood pole line management, as investments made in regular inspection and early detection of issues extend the useful life of the poles, support the deferral of line reconstruction, and prevent forced outages.

As requested by the Board of Commissioners of Public Utilities ("Board") in Board Order P.U. 2(2026), Hydro has identified a plan and timeline for the replacement of the remaining poles greater than 55 years of age, which has been provided as Appendix A within this report. Hydro's experience with the WPLM Program has demonstrated that the expected useful life of its transmission lines can be extended by more than 15 years through early inspection and refurbishment, with its latest Wood Pole Line Management Program – Progress Report[1] indicating the expected mean life is 67 years. This is significantly higher than the conventional economic life of 40 years. Currently Hydro has 35 wood pole transmission lines that are 40 years of age or older.

Two complete inspection cycles (ten-years per cycle) have now been performed under the WPLM Program, the results of which demonstrate that the cost of the program is well justified by reductions of in-service failures and unplanned repair costs, as well as reliability improvements and life extension of existing pole plant assets. In addition, the program has been effective in preventing the premature retirement of viable components, which have not reached the end of their expected useful life.

[1] Wood Pole Line Management Program – Progress Report (2018–2022), Newfoundland and Labrador Hydro, April 21, 2023.

Due to its cyclical nature, this program is continuous in nature, as poles are inspected and refurbished each year based on the prior two-year inspection cycle. Treatments for poles begin at the 20-year in-service mark, with refurbishment completed as required. The planned work for 2027 is estimated at $7,998,000.

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Appendix A: Plan for Wood Poles Greater than 55 years old

Appendix B: Iowa Curve – Hydro Pole Line Network

1.0 Introduction

Many of Hydro's transmission lines are of wood pole construction. As wooden poles and other framing members age, their preservative retention levels decrease, causing them to become increasingly vulnerable to deterioration by different agents, including fungi and insects. In addition, metal parts can rust and/or suffer from metal fatigue over decades. Wood poles and the associated components must be regularly inspected and treated to proactively identify and assess deterioration.

The WPLM Program is an annual program that promotes the early detection of deteriorated poles and other line components. Early detection is required to avoid potential safety hazards and identify poles and other components that are at early stages of decay or deterioration to ensure that corrective measures can be taken to extend the expected useful life of the poles. This program is a least-cost strategy for wood pole line management, as investments made in regular inspection and early detection of issues extend the useful life of the poles, support the deferral of line reconstruction, and prevent forced outages.

2.0 Program Description and Justification

2.1 Program Background

Hydro first initiated the WPLM Program as a pilot study in 2003, and subsequently determined that the program should continue as a long-term asset management and life-extension program. The program was presented to the Board as part of Hydro's 2005 Capital Budget Application ("CBA").[2]

Prior to 2003, Hydro's pole inspection and maintenance practices followed the traditional utility approach of sounding inspections only. In 1998, Hydro began to collect core samples from select poles to test for preservative retention levels and pole decay. The results of early tests raised concerns regarding the general preservative retention levels in the poles. This testing confirmed that there were poles in Hydro's system that had a preservative level below that which is necessary to maintain the required design criteria. During this period, Hydro replaced certain poles because the preservative level had decreased to the point that decay had advanced and the pole was no longer structurally sound.

[2] "2005 Capital Budget Application," Newfoundland and Labrador Hydro, rev. September 28, 2004 (originally filed August 10, 2004), sec. G, app. 2.

These inspections and the analysis of the data confirmed that a more rigorous WPLM Program was required.

Figure 1 illustrates typical wood pole inspection techniques conducted in the WPLM Program. Figure 2 provides examples of wood pole line inspection results.



Figure 1: WPLM Inspection Techniques.
Clockwise from Bottom Left: (1) Field Data Collector, (2) Installing Boron Treatment, (3) Climbing Inspection, (4) Destructive Testing at Memorial University of Newfoundland



Figure 2: Examples of Wood Pole Inspection Results

Historically, Hydro has applied an anticipated useful or economic service life of 40 years for its wood pole transmission lines. As of 2026, 35 wood pole transmission lines remain in service that have exceeded this anticipated service life. Of these lines, 26 are greater than 45 years of age, with the oldest line installed 61 years ago. Hydro's experience with the WPLM Program has therefore demonstrated that the expected useful life of its transmission lines can be extended by more than 15 years through early inspection and refurbishment.[3]

2.2 Program Description

The WPLM Program is a condition-based asset renewal program that uses the basic principles and strategies of reliability-centered maintenance. Under the WPLM Program, full climbing inspections are performed on wooden transmission structures, poles are re-treated internally with preservatives, and components are assigned a rating. Inspections that result in findings on the lower end of the rating scale are subject to further assessment and increased inspection frequency as necessary. If these inspection results identify concerns over the adequacy of a pole, further engineering analysis is performed to estimate the in-service pole strength and to determine if the structure is still able to withstand its design loads. Recommendations are then made for refurbishment or replacement of deteriorated line components, including poles, bracing, hardware, conductors, etc. Recommended work is generally completed in subsequent years; however, in cases where components are deemed unable to last another year, Hydro replaces or refurbishes them in the current year. Such replacements are typically managed within the existing budget.

The purpose of the WPLM Program is to detect and treat deteriorating wood poles and line components before the integrity of the structures is jeopardized. If the deterioration of the structures or components is not detected early, the reduced integrity of the structure could affect the reliability of the line and present safety issues and hazards for Hydro personnel and the public.

The WPLM Program inspection schedule generally reflects plans to complete older lines first and work toward newer lines. The specific lines and the number of poles included in the program are reviewed on an annual basis and may be modified based on age, priority (i.e., radial or redundant), and condition. Lines are incorporated into the program at the age of 20 years.

[3] For additional details, please refer to Hydro's most recent WPLM Program report, Wood Pole Line Management Program Progress Report (2018–2022), Newfoundland and Labrador Hydro, April 21, 2023.

Hydro committed to providing the Board with annual updates on the program, including progress summaries of the work completed to date and a forecast of future program objectives. In Board Order No. P.U. 2(2026), the Board also requested that Hydro identify a plan and timeline for the replacement of the remaining poles greater than 55 years of age. This update is provided herein as Appendix A.

2.2.1 2025 WPLM Program – Review

The inspection and wood pole treatment work for 2025 is summarized in Table 1. This work was completed between April and October of 2025.

Table 1: 2025 Inspection Plan

Regions	Line Name	Year In Service	Voltage Level	Number of Poles Inspected
Eastern	TL 218	1983	230 kV	425
Central	TL 224	1962	138 kV	225
	TL 235	1966	230 kV	3
	TL 245	1969	138 kV	3
	TL 263	2002	230 kV	74
Western	TL 250	1987	138 kV	300
Northern	TL 239	1982	138 kV	347
Labrador	L32	1963[4]	46 kV	112
	L33	1976	46 kV	64
	L36	2007	46 kV	64
Total				**1,617**

A list of refurbishment work completed in 2025 is provided in Table 2.

[4] Line L32 is part of the 46 kV system in Labrador West. As this line was not constructed by Hydro (constructed by the mines in western Labrador in the 1960s), the exact age of the line is unknown. It is assumed that this line was constructed during the same timeframe as the lines between Twin Falls and Wabush in 1963.

Table 2: 2025 Refurbishment Plan

Component	Region				
	Eastern	Central	Western	Northern[5]	Total
Poles	31	44	3	15	**93**
Cross arms	32	31	1	26	**90**
Cross bracing	14	20	0	4	**38**
Knee bracing	45	44	0	0	**89**
Foundations	1	0	1	3	**5**
Miscellaneous (insulators, hardware, etc.)	44	101	6	58	**209**

2.2.2 2026 WPLM Program

The inspection and wood pole treatment work scheduled for 2026 is summarized in Table 3. This work is scheduled to be executed between April and October of 2026, and if deemed necessary based on condition assessment criteria, will inform the planned refurbishment work for 2028.

Table 3: 2026 Inspection Plan

Region	Line Name	Year In Service	Voltage Level	Number of Poles Inspected
Eastern	TL 212	1966	138 kV	372
Central	TL 232	1981	230 kV	400
Western	TL 250	1987	138 kV	300
Northern[6]	TL 241	1983/1995	138 kV	1,082
	TL 244	1983	138 kV	275
Total				**2,429**

A list of refurbishment work to be completed in 2026 is provided in Table 4.

[5] Includes Labrador.
[6] *Supra* f.n. 5.

Table 4: 2026 Refurbishment Plan

	Region				
Component	**Eastern**	**Central**	**Western**	**Northern**[7]	**Total**
Poles	29	13	24	13	**79**
Cross arms	36	8	13	5	**62**
Cross bracing	21	10	3	0	**34**
Knee bracing	26	1	17	0	**44**
Foundations	2	1	25	5	**33**
Miscellaneous (insulators, hardware, etc.)	120	58	17	13	**208**

2.3 Program Justification

The program is a strategic asset management and life extension program for Hydro's wood pole transmission lines. Since its inception, Hydro has demonstrated that it is a least-cost strategy for the WPLM Program, as investments made in the regular inspection and early detection of issues extends the useful life of the poles, supports the deferral of line reconstruction, and prevents forced outages. In 2005, the Board determined that this approach was justified and prudent, stating:

> This approach is a more strategic method of managing wood poles and conductors and associated equipment and (the Board) is persuaded that the new WPLM Program, based on RCM principles, will lead to an extension of the life of the assets, as well as a more reliable method of determining the residual life of each asset. One of the obvious benefits of RCM will be to defer the replacement of these assets, thereby resulting in a direct benefit to the ratepayers.[8]

Two complete inspection cycles (ten years per cycle) have now been performed under the program; the results of which demonstrate that the cost of the WPLM Program is well justified by cost-avoidance savings through reduced in-service failures and reduced unplanned repair costs, as well as reliability improvements and life extension of existing pole plant assets. In addition, the program has been effective in preventing the premature retirement of viable components, which still have a continued life expectancy.

[7] Includes Labrador.
[8] *Public Utilities Act,* RSNL 1990, c P-47, Board Order No. P.U. 53(2004), Board of Commissioners of Public Utilities, December 23, 2004, p. 23/13-18.

3.0 Asset Overview

3.1 Asset Background

Hydro maintains approximately 2,300 km of wood pole transmission lines operating at voltages of 46 kV, 69 kV, 138 kV, and 230 kV. These lines consist of over 24,000 poles of varying ages, from new to 61 years old. As of 2026, approximately 91% of Hydro's transmission pole assets are more than 20 years old, approximately 56% are more than 40 years old.

3.2 Asset Condition

All poles inspected under the program are rated based on a full climbing inspection and condition assessment. Explanations for the rating system are found in Table 5.

Table 5: Wood Pole Line Management Rating System

Condition	Rating	Post-Inspection and Treatment Action
Severe/Hazardous to Climb	5	Refurbishment required as soon as practicable.
Poor	4	Engineering analysis and subsequent refurbishment if deemed necessary.
Moderate	3	Monitor.
No issues	2	None.
New (<10 Years)	1	Climbing inspection and treatment not required.

Chart 1 illustrates Hydro's wood transmission pole assets by condition rating as of April 2026. As can be seen by the information presented, the majority of poles within Hydro's transmission system are considered to be in excellent condition based on established inspection criteria within the WPLM Program.

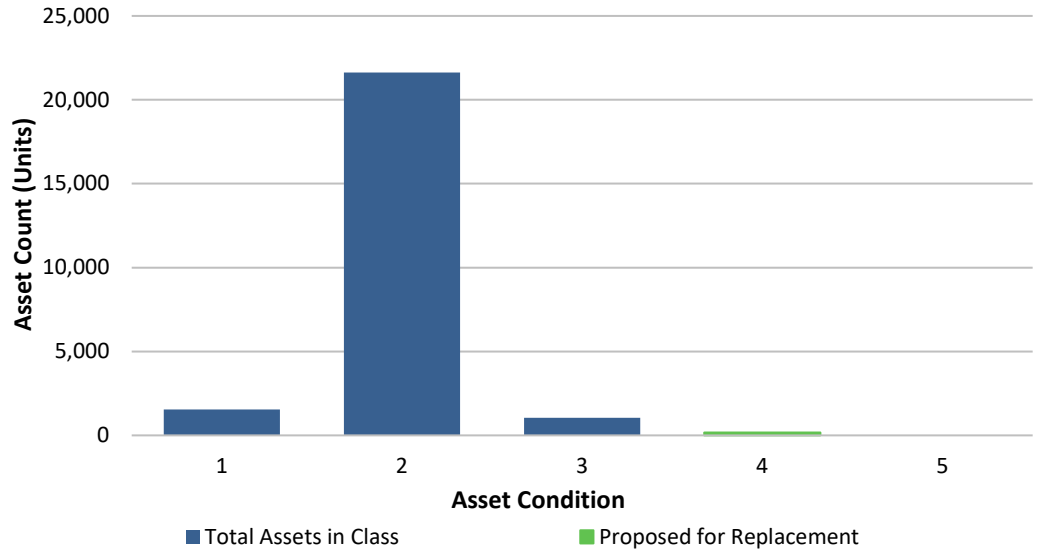


Chart 1: Asset Condition

3.3 Condition-Based Remaining Life

Chart 2 illustrates Hydro's wood transmission pole assets by expected remaining life as of April 2026.

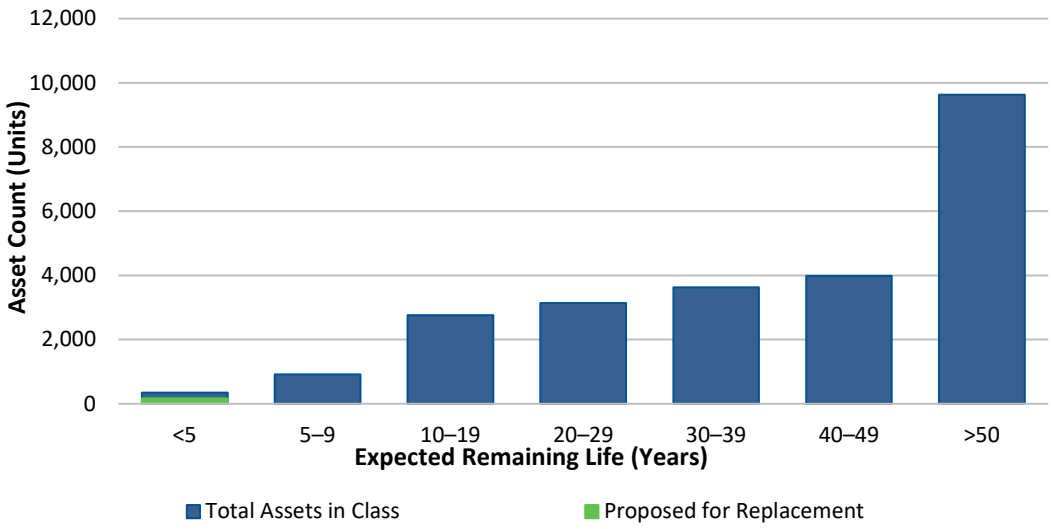


Chart 2: Condition-Based Expected Remaining Life

3.4 Asset Ages

Chart 3 illustrates Hydro's wood transmission pole assets by age as of April 2026. In line with direction provided in Board Order No. P.U. 2(2026), Hydro has identified a plan and timeline for the replacement of the remaining poles greater than 55 years of age, which has been provided as Appendix A.

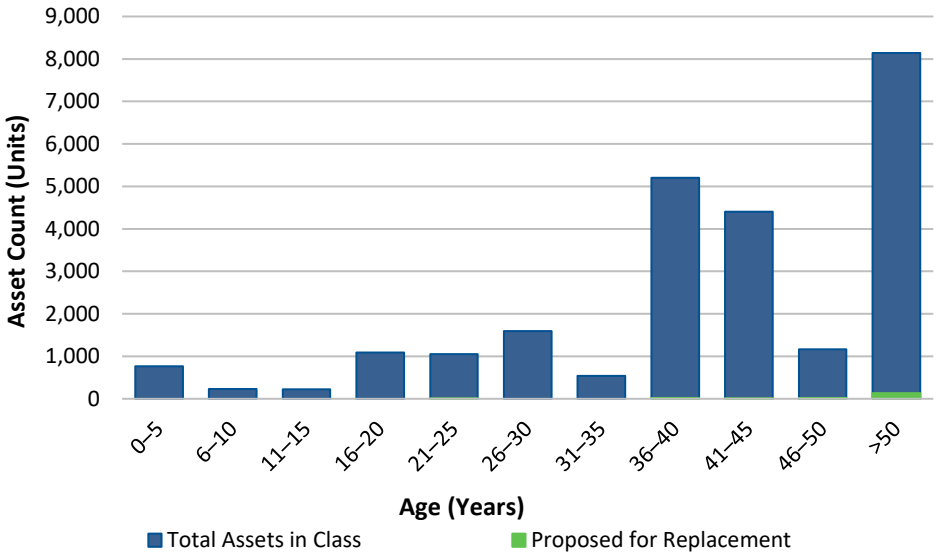


Chart 3: Asset Counts by Asset Age[9]

4.0 Trending

4.1 Assets Installed/Replaced/Upgraded

Chart 4 provides the five-year historical, current, and five-year forecast number of poles replaced per year. Based on recent inspection data collected from several of Hydo's oldest lines, Hydro is forecasting an increase in refurbishment requirements over the next five years. The inspection results indicate that these lines require a higher level of restoration work, consistent with expected utility asset-aging trends and condition assessment outcomes.

Forecast numbers are determined through Iowa curves. Iowa curves were developed in a study at the University of Iowa and display functional failures or retirements of asset classes. Each curve represents a probability distribution and has a series of attributes. The curves support realistic forecasting of the remaining life of groups of assets. The latest Iowa curve for poles in Hydro's Island Interconnected

[9] One pole is being relaced at 24 years of age due to decay. The Iowa curves show a 0.4% chance of rejection of a pole this age.

System can be found in Appendix B. Costs for this increase have been accounted for in the projected program budget as presented in Section 6.1.

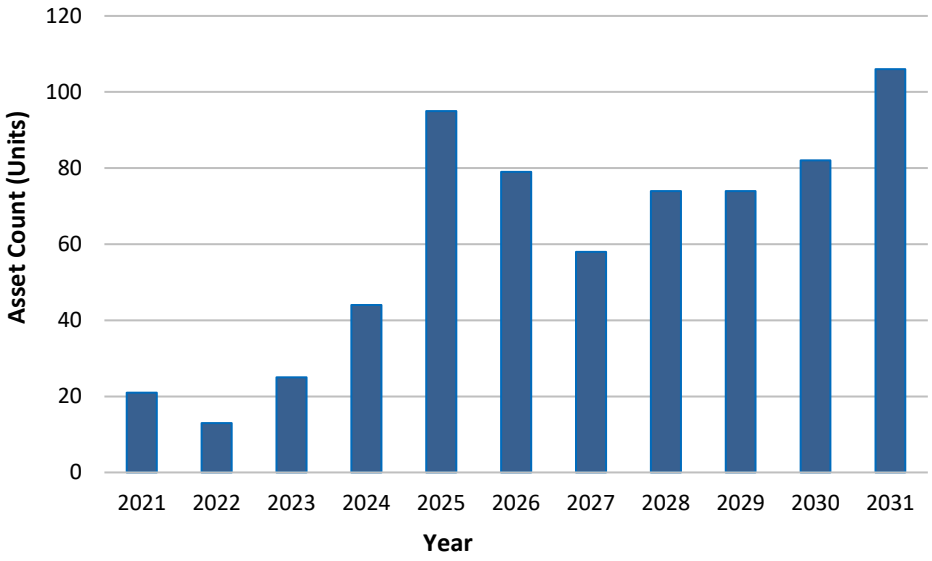


Chart 4: Historical & Forecasted Number of Assest Installed/Replaced/Upgraded

4.2 Historical and Forecast Average Unit Costs

As discussed, in addition to pole replacements, the WPLM Program includes the inspection and refurbishment of all components of Hydro's wooden transmission lines such as crossarms, cross bracing, knee bracing, hardware, etc. The work completed varies based on the actual condition of the asset. In most cases, the work completed on any one structure is not related to the work on the next structure (e.g., one structure may require a pole replacement and the next structure may need a crossarm or an insulator replacement). The same is true for a breakdown by individual transmission line, where the cost will be affected by the configuration, voltage, age, and geographical location of the line. Additionally, environmental sensitivities are higher for some areas and, in recent years, a significant amount of environmental mitigation has been required to travel over wetlands to complete pole replacements.

4.3 Historical Reliability

Chart 5 shows the average annual forced outage hours due to structural failures on wooden transmission lines before and after the implementation of the WPLM. The outage data demonstrates that there has been a material improvement on the Avalon Peninsula since Hydro launched the WPLM Program in 2003.

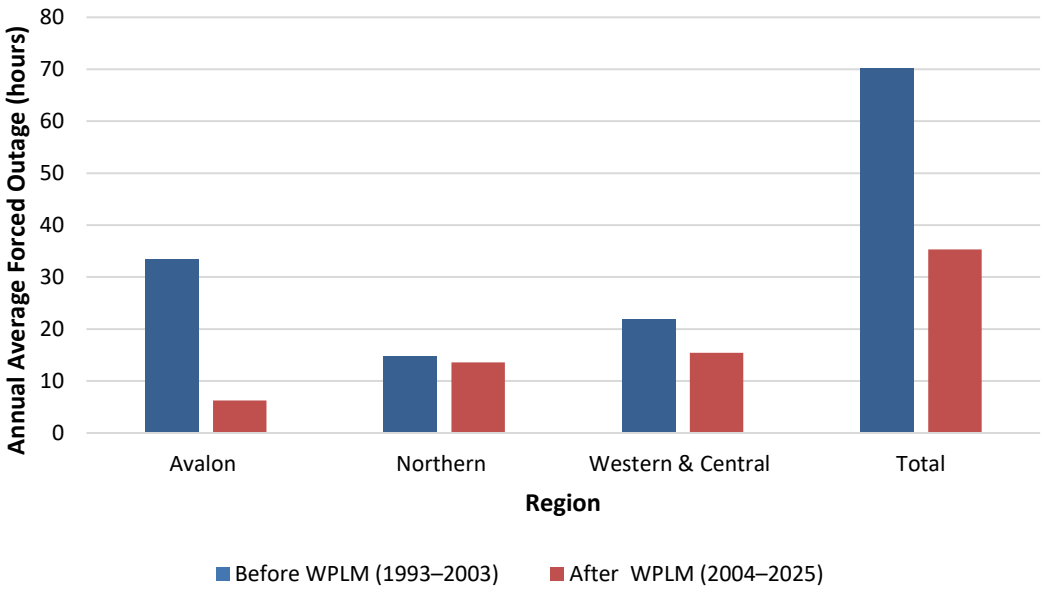


Chart 5: Outage Data for Hydro's Wooden Transmission System (1993–2025)[10]

Chart 6 and Chart 7, respectively, show the historical total outage frequencies and durations for Hydro's wooden transmission lines from 2021 to 2025.

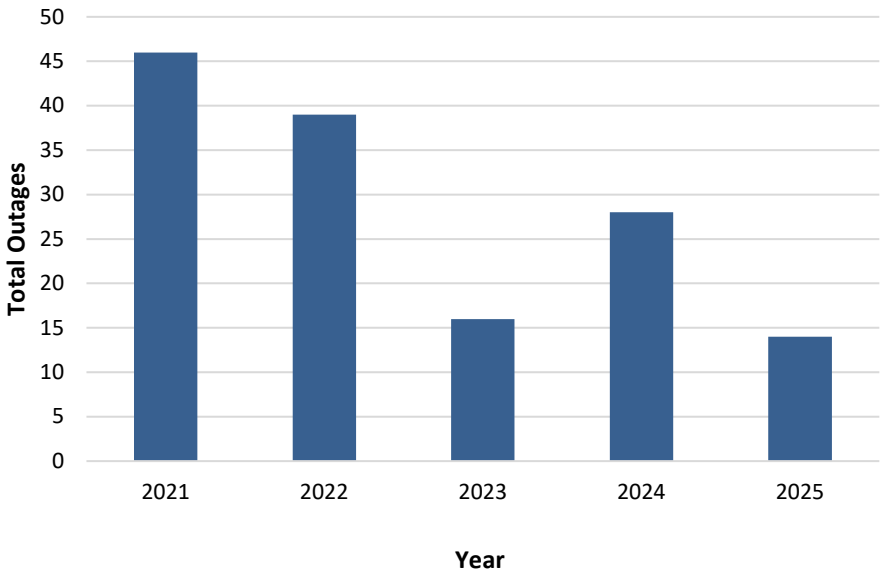


Chart 6: Historical Line Outage Frequency for Wooden Transmission Lines (All Causes)

[10] Northern region includes Labrador.

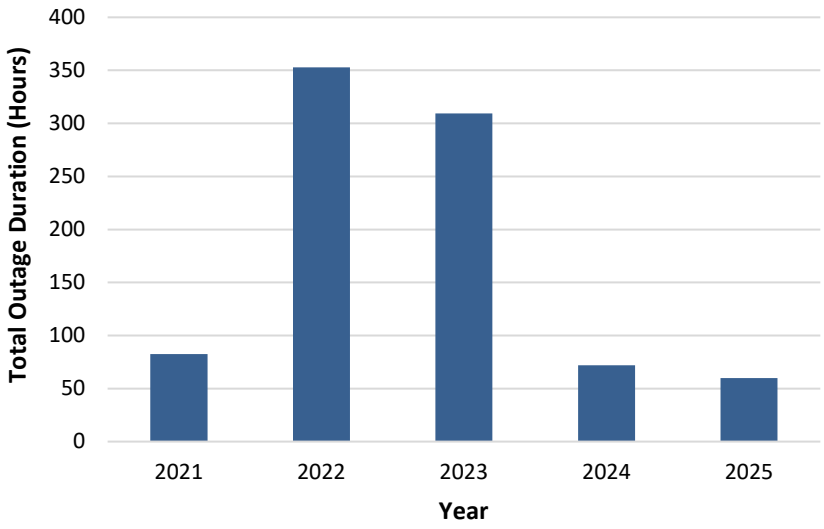


Chart 7: Historical Line Outage Duration for Wooden Transmission Lines (All Causes)

The increase in total outage duration for 2022 can be attributed mainly to failures on TL203 and TL219 during an ice storm in early Feburary 2022, as reported to the Board in "Power Outage and Incident Advisory Report 2022-H-010-a." The total outage duration for 2023, as shown in Chart 7, can be attributed mainly to a pole fire on TL221 in early February 2023. TL221 was out of service for ten days before the pole was replaced; however, there were no customer outages due to this event.

5.0 Analysis

5.1 Evaluation of Alternatives

Hydro considered the following alternatives:

- Pace Reduction; and
- Continuation of the Program at the Current Pace.

5.1.1 Pace Reduction

The program employs a balanced ten-year inspection cycle that includes inspection, treatment, and replacement, as required, following reliability-centered maintenance principles. Hydro allows up to 3 years for replacement to allow for appropriate planning.[11] Deferral of the program would be detrimental

[11] For instance, in the 2026 CBA, Hydro forecasted 100 poles for replacement in 2027; however, through the planning cycle the replacements were spread out over three years based on criticality.

to program execution, effectiveness, and resource balancing. In 2018, as part of its second WPLM Program progress report, Hydro investigated the optimum inspection/maintenance interval for the program. Results showed that Hydro's inspection interval is in line with industry best practices. As a result, pace reduction is not a viable alternative.

5.1.2 Continuation of Program at Current Pace

The WPLM Program is a proactive, condition-based asset management program that follows reliability-centred maintenance principles. Transmission line assets must be managed in such a manner as to balance reliability and costs. Condition-based programs are more progressive than age-based programs in which assets are replaced once they have surpassed their expected useful life with no or little consideration of their condition.

5.2 Least-Cost Evaluation

This program is a least-cost strategy for WPLM, as investments made in regular inspection, treatment, and early detection of issues extends the useful life of the lines, supports the deferral of line reconstruction, and prevents forced outages. Hydro's analysis of this program substantiates the program as a least-cost strategy. It demonstrates that the cost of the program and the average inspection interval of ten years is well justified by cost-avoidance savings through reduced in-service failures and reduced unplanned repair costs, as well as life extension of existing pole plant assets by more than 15 years. The overall pole replacement rate per year is well below the published industry data. The development of a rigorous methodology to assess and analyze the pole inspection data allows Hydro to continue to proactively identify the right level of expenditure, on the right poles, at the right time. Hydro proposes the continuation of its WPLM Program at the current inspection intervals as this approach is demonstrated to be the least-cost strategy for the renewal of wood pole transmission lines.

5.3 Recommended Alternative

5.3.1 Risk of Asset Stranding

All of the transmission lines currently included in the program are planned to remain in service; therefore, Hydro does not foresee any risk of asset stranding as it relates to the WPLM Program.

5.3.2 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027 program in accordance with Hydro's Capital Risk Assessment process, as outlined in Section 7.0 of Schedule 1. The outcome of this assessment is provided in Table 6.

Table 6: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	4	4	**16**
Post-Implementation	4	1	**4**
		Risk Mitigated	**12**
		Risk Mitigated per $1 Million	**1.5**

6.0 Scope of Work

The inspection and treatment work scheduled for 2027 is summarized in Table 7. This work is scheduled to be executed between April 2027 and November 2027.

Table 7: 2027 Inspection Plan[12]

Region	Line No.	Year Built	Age of Line	Target Number of Poles to Inspect
Central 230kV	TL232	1981	45	372
Central <230kV	TL219	1990	36	350
	TL250	1987	39	250
	TL251	1981	45	300
	TL225	1970	56	49
Northern	TL227	1970	56	480
	TL239	1982	44	300
Total				**2,101**

Scheduled refurbishment for 2027 is summarized in Table 8.

[12] There are currently no line inspections planned for Labrador under this program in 2027.

Table 8: 2027 Refurbishment Plan

	Region				
Component	**Central (230kV)**	**Central (<230kV)**	**Northern**	**Labrador**	**Total**
Poles	33	4	7	9	**53**
Cross arms	30	0	20	4	**54**
Cross bracing	36	2	0	2	**40**
Knee bracing	18	0	0	0	**18**
Foundations	0	0	1	7	**8**
Miscellaneous (insulators, hardware, etc.)	52	1	26	4	**83**

6.1 Program Budget

The estimate for this program is shown in Table 9.

Table 9: Program Estimate ($000)

Program Cost	**2027**	**2028**	**Beyond**	**Total**
Material Supply	564.0	0.0	0.0	**564.0**
Labour	3,786.4	0.0	0.0	**3,786.4**
Consultant	35.3	0.0	0.0	**35.3**
Contract Work	1,440.9	0.0	0.0	**1,440.9**
Other Direct Costs	1,048.7	0.0	0.0	**1,048.7**
Interest and Escalation	435.2	0.0	0.0	**435.2**
Contingency	687.5	0.0	0.0	**687.5**
Total	**7,998.0**	**0.0**	**0.0**	**7,998.0**

Chart 8 provides the five-year historical program expenditures, the forecast 2026 expenditures, the proposed 2027 program budget, and the forecast budget through 2031.

Increased program expenditures can be attributed to:

- Increased cost for environmental mitigation, due to work in recent years on remote sections of the line without adequate existing access. In addition, work methods requiring heavy tracked equipment are increasing in frequency within Hydro and the utility industry as a whole, prompting the need for additional environmental protection to safely utilize this equipment.

- Increased labour costs/contractor pricing due to global inflation exceeding that projected in the budget application.

- Increased cost for procurement and expediting of materials as a result of global supply chain issues.

- Increased quantity of structures with poor condition assessment results due to the completion of inspections for the oldest lines in the system (TL201 and TL203). This has also resulted in unplanned scope additions to the scheduled refurbishment plan.

Hydro will monitor these issues in order to determine the optimal balance of cost, reliability and environmental responsibility in relation to the delivery of this program.

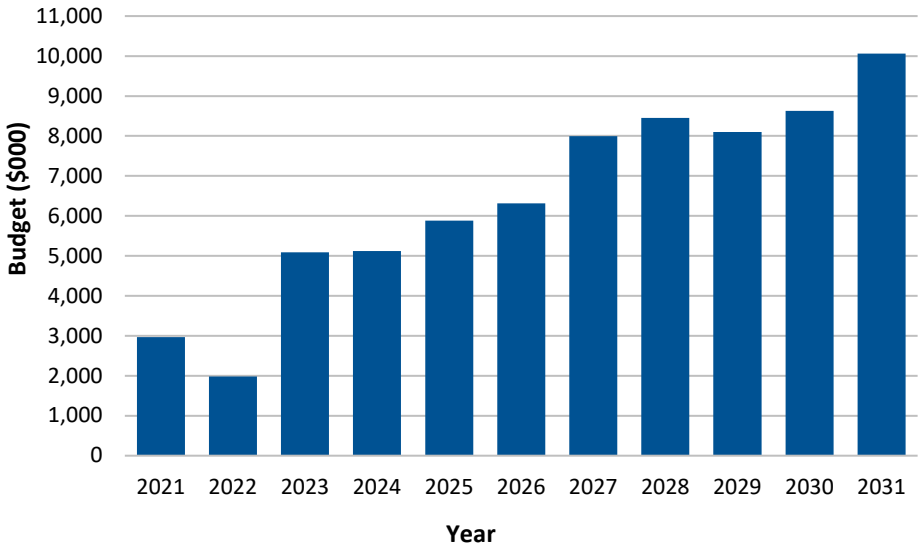


Chart 8: Historical and Forecast Program Budget

6.2 Program Schedule

The 2027 program schedule involves many transmission lines and is dependent on the annual workload and availability of outages. As both the inspection and refurbishment scopes are highly dependent on weather constraints, work scheduled for 2027 will commence as early in the year as system conditions allow. The detailed annual work schedule for 2027 will be determined during the engineering and planning stage and will be highly dependent upon planned outages.

Table 10 provides a high-level program activity schedule reflecting the planned cycle of the program.

Table 10: Program Schedule

Activity	Start Date	End Date
Line Inspection and Treatment for 2029 Refurbishment	May 2027	November 2027
Inspection Data Analysis	June 2027	October 2027
Material Procurement	February 2027	November 2027
Refurbishment Work Field Planning	May 2027	September 2027
Refurbishment	April 2027	November 2027

7.0 Conclusion

The WPLM Program is an important part of Hydro's ongoing asset renewal. Proactive refurbishment of Hydro's wood pole transmission lines is required to support Hydro's legislated mandate to ensure the delivery of safe, reliable, least-cost electricity in an environmentally responsible manner. Therefore, Hydro proposes to continue the WPLM Program in 2027.

Appendix A

Plan for Wood Poles Greater than 55 years old



As outlined in Board Order No. P.U. 2(2026), Hydro has identified a plan and timeline for the replacement of the remaining poles greater than 55 years of age. Approximately 28% of Hydro's transmission line poles are over 55 years of age. Due to the condition-based maintenance approach of the WPLM Program, asset age is not necessarily indicative of a replacement being required. Hydro's WPLM Program has effectively extended the lives of the poles; therefore, Hydro would continue to monitor condition of the poles over 55 years of age until the data shows the condition requires replacement, or a major upgrade such as reconductoring would justify the replacement.

The ability to predict asset degradation is important in the management of any asset. One method to statistically estimate the remaining life of a utility wooden pole is through the development of Iowa curves using real rejection rate data from inspections.[1] Each curve represents a probability distribution and supports realistic forecasting of the remaining life of groups of assets. As shown in Appendix A, based on the current Hydro projection, the approximate expected mean life for a wood pole in Hydro's transmission network is more than 90 years. This curve will continue to become more refined as more inspection data is collected; however, the curve based on 20 years of data collected since the inception of the WPLM demonstrates that the WPLM Program has significantly extended the expected life of wood pole transmission infrastructure.

The level of deterioration of wood poles is subject to a number of factors, particulary environmental conditions, which are influenced by line location, local climate and exposure levels. For example, as reported in Hydro's most recent WPLM Progress Report,[2] the expected mean life of a wood pole on the Avalon Peninsula is approximately 67 years,[3] which is significantly higher than the conventional economic life of 40 years historically used in the industry, and approximately 17 years longer than the 50-year expected mean life modeled by the Iowa-50 benchmark.[4] It is also considerably shorter than the survival plot for the entire Hydro wood pole line network. Lines on the Avalon Peninsula are exposed to the most severe environmental conditions representing the worst case scenario for degradation.

[1] Iowa curves are a type of survivor curve developed by the University of Iowa, utilized to model the predicted rate of failure or replacement of a population of assets over time.
[2] Wood Pole Line Management Program - Progress Report (2018–2022), Newfoundland and Labrador Hydro, April 21, 2023.
[3] The 67-year projected life determined in this study is greater than the approximately 60-year estimated useful life derived in the 2015 depreciation study. The difference is primarily because this study considers only the pole inspection data since 1998, and excludes data such as line failure under extreme wind and ice conditions, or any other poles replaced previous to the initiation of the WPLM Program.
[4] Mankowski, Hansen and Morrell, "Wood Pole Purchasing, Inspection and Maintenance: A survey of Utility Practices," Forest Product Journal, vol. 52, no. 11/12.

Therefore, wood poles within lines on the Avalon Peninsula would require replacement sooner than line located in the Long Range Mountains.

Given the condition-based nature of this program, Hydro will continue to monitor condition of the poles in excess of 55 years of age in line with WPLM principles and approach. The anticipated replacement plan for poles greater than 55 years of age is summarized in Table 1. This work is expected to be completed over the next 35 years.[5] For purposes of the plan, it has been assumed that Hydro's transmission lines will require re-conductoring at approximately 80 years of age, and it is anticipated that the least-cost approach would be to replace all remaining poles of original vintage at the same time due to economy of scale. This is an estimate, and ultimately the timing of re-conductoring will depend on the conductor condition.

Table 1: Replacement Plan for Poles over 55 Years of Age

Region	Line Name	Year in Service	Voltage Level	Number of Poles Over 55 Years	Proposed Years of Replacement[6]	Average Pole Age at Replacement
Eastern	TL 203	1965	230 kV	255	2027, 2037, 2047	67
	TL 201	1966	230 kV	413	2034, 2044, 2054	67
	TL 218	1966	230 kV	91	2027, 2037, 2047	71
	TL 212	1966	138 kV	335	2028, 2038, 2048, 2058	74
Central	TL 223	1966	138 kV	347	2031, 2041, 2051	81
	TL 222	1967	138 kV	826	2035, 2045, 2055	82
	TL 224	1968	138 kV	804	2027, 2037, 2047, 2057	83
	TL 210	1969	138 kV	556	2034, 2044, 2054	70
	TL 220	1970	138 kV	206	2027, 2032, 2042, 2052	61
Western	TL 215	1969	69 kV	344	2031, 2041, 2051	67
	TL 245	1969	138 kV	270	2035, 2045, 2055	81
	TL 225	1970	69 kV	48	2029, 2039, 2049, 2059	82
Northern	TL 221	1970	69 kV	574	2034, 2044, 2054	80
	TL 226	1970	69 kV	868	2033, 2043, 2053	79
	TL 227	1970	69 kV	900	2029, 2039, 2049, 2059	84

Hydro's WPLM is condition-based, and over the course of its execution, has proven successful in the life extension of wood pole transmission lines. The Iowa curves in question are iterative, and are updated

[5] As Hydro's WPLM Program is founded on condition-based maintenance, the long term plan for poles over 55 years of age would be to continue with this approach until the data shows the condition requires replacement, or a major upgrade such as reconductoring would justify the replacement.

[6] If 2027 data indicates that conditions are worsening, replacement projections will increase.

based on annual inspection data. Should the condition of an asset change, the Iowa curve will be updated and the life expectancy will change accordingly. As such, poles over 55 years of age that are shown to not require replacement based on condition will not be prematurely replaced.

Appendix B

Iowa Curve – Hydro Pole Line Network



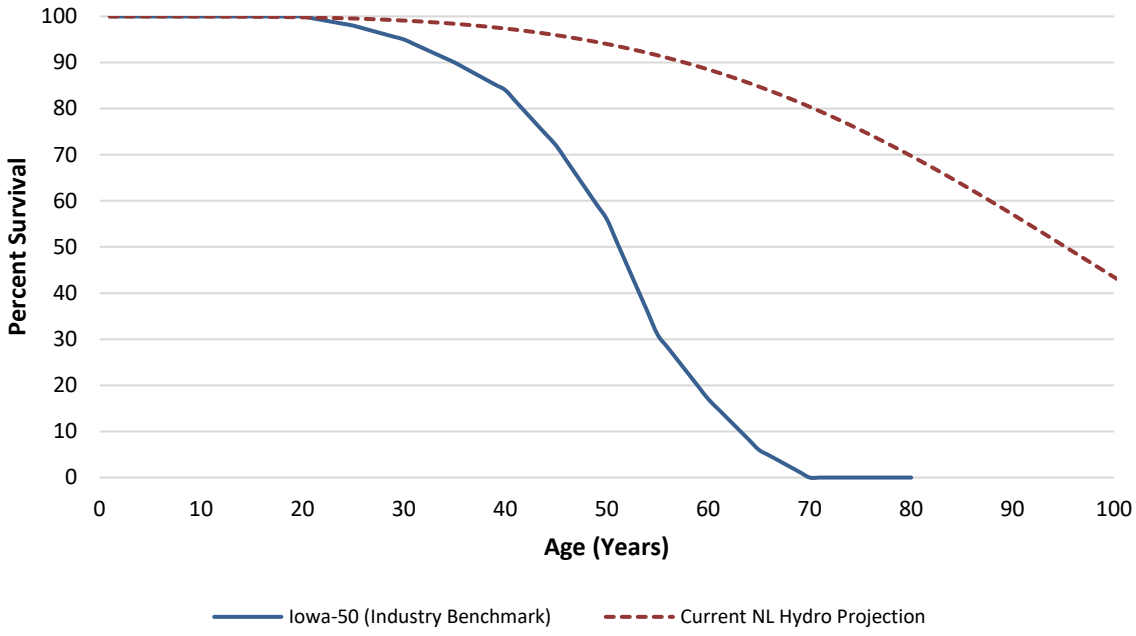


Chart 1: Survival Plot – Newfondland and Labrador Hydro Wood Pole Line Network

Distribution System In-Service Failures and Miscellaneous Upgrades

(2027)



Distribution System In-Service Failures and Miscellaneous Upgrades (2027)

Location: Various

Investment Classification: Renewal

Asset Category: Distribution

Estimated Cost: $6,665,200

Executive Summary

Newfoundland and Labrador Hydro ("Hydro") has an Asset Management Program that governs the lifecycle of its distribution assets. This program monitors, maintains, refurbishes, replaces, and disposes of assets as required to ensure fulfillment of Hydro's legislated mandate to provide reliable service in an environmentally responsible manner consistent with least-cost. The program also includes expenditures related to the replacement of existing streetlights and for the purchase of selected capital spare equipment.

Generally, Hydro identifies and plans the refurbishment and replacement work that will be required for its distribution assets in time for inclusion within its capital budget applications ("CBA"). However, there are situations where immediate refurbishment or replacement must be completed due to the occurrence of an actual failure, the identification of an incipient failure, or the determination of faster-than-anticipated equipment deterioration.

Hydro proposes the continuation of this program to provide safe, least-cost, environmentally responsible, and reliable power. Without this program in place, there is a high risk of substantial distribution equipment damage, customer outages that exceed the maximum allowable durations, and unsafe conditions for Hydro personnel. There have been no viable alternatives to this type of program identified.

The estimated cost for work executed under this program in 2027 is $6,665,200, which is based on the average expenditures over the past three years, from 2023 to 2025.[1]

[1] Budget for streetlight modernization has been removed from this average as this effort is anticipated to conclude in 2026.

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1.0 Introduction

Hydro conducts asset management activities to proactively identify, replace, repair, or refurbish equipment to minimize the disruption of service and to avoid unsafe working conditions due to equipment failure. An objective of Hydro's Asset Management Program is to identify refurbishment and replacement activities that require approval by the Board of Commissioners of Public Utilities ("Board") in time to be included in Hydro's annual CBA. This is achieved through the Preventive Maintenance Program using various condition-based assessments and testing procedures.

Hydro has had success in projecting the deterioration rate of equipment for submission of refurbishment or replacement work into CBAs. However, there are situations where immediate refurbishment or replacement must be completed due to the occurrence of an actual failure, the identification of an incipient failure, or the determination of faster-than-anticipated equipment deterioration. These situations can be caused by events such as vandalism, storm damage, lightning, accidental damage, abnormal system operations and corrosion. Hydro uses historical data and engineering judgement to predict the magnitude of in-service failure expenditures.

The Distribution System In-Service Failures and Miscellaneous Upgrades Program permits Hydro to perform refurbishment, replacement and upgrades of equipment as required, ensuring the continued delivery of reliable electrical service to its customers.

2.0 Program Description and Justification

Due to the nature of distribution equipment and infrastructure, unanticipated failures and deterioration will occur. Under the Distribution System In-Service Failures and Miscellaneous Upgrades program, Hydro is proposing to undertake the immediate capital refurbishment and replacement work required to maintain the safe and reliable operation of its distribution systems. Deferral of work that is justified under this program could result in a detrimental impact on customer power supply or an unacceptable risk to workers or public safety. Required work will be evaluated to determine the appropriate form of execution as an in-service failure, an Allowance for Unforeseen Item or a supplemental project.

The purchase of capital spare equipment, or their refurbishment, is also a part of this program. There are no capital spares currently included in the scope for 2027.

Throughout 2027, Hydro may purchase additional capital spares identified by asset management personnel as requiring immediate procurement to offset deficiencies in its capital spares, and to account for increasing lead times for equipment.

3.0 Asset Overview

3.1 Asset Background

The majority of Hydro's distribution system assets were installed in the 1960s and 1970s, and have been deteriorating at varying rates over the last 50 to 60 years. Like many electrical systems, the reliability of the entire distribution network is a function of its least reliable component. The assets requiring immediate, unplanned replacement or refurbishment work in a given year cannot be identified in advance. The assets that are included under the Distribution System In-Service Failures and Miscellaneous Upgrades Program are:

- Substation transformers;
- Voltage regulators;
- Reclosers;
- Capacitors;
- Sectionalizers;
- Switches;
- Poles;
- Crossarms, insulators, conductors, hardware;
- Pole top distribution transformers; and
- Streetlights.[2]

3.2 Asset Condition

Assets replaced or refurbished under this program have experienced unplanned failure or exhibit signs of incipient failure; therefore, these assets have reached the end of their serviceable life.

[2] While the streetlight modernization effort is anticipated to conclude in 2026, regular replacement activities for streetlights remains within the scope of this program.

3.3 Asset Ages

The age of assets potentially covered under this program varies. Unplanned replacement or refurbishment activities due to failure may be necessary at any time during the asset lifecycle.

4.0 Trending

Over the past five years, on average, Hydro has replaced 215 unplanned assets per year under the program, excluding streetlight modernization.

4.1 Assets Installed/Replaced/Upgraded

The number of unplanned assets installed annually under the program, over the past five years, excluding streetlights, is provided in Chart 1.

As of April 2026, Hydro has replaced more than 7,500 streetlights with LED[3] technology, representing over 85% of all fixtures. Hydro anticipates full completion of the streetlight modernization effort in 2026 as planned.

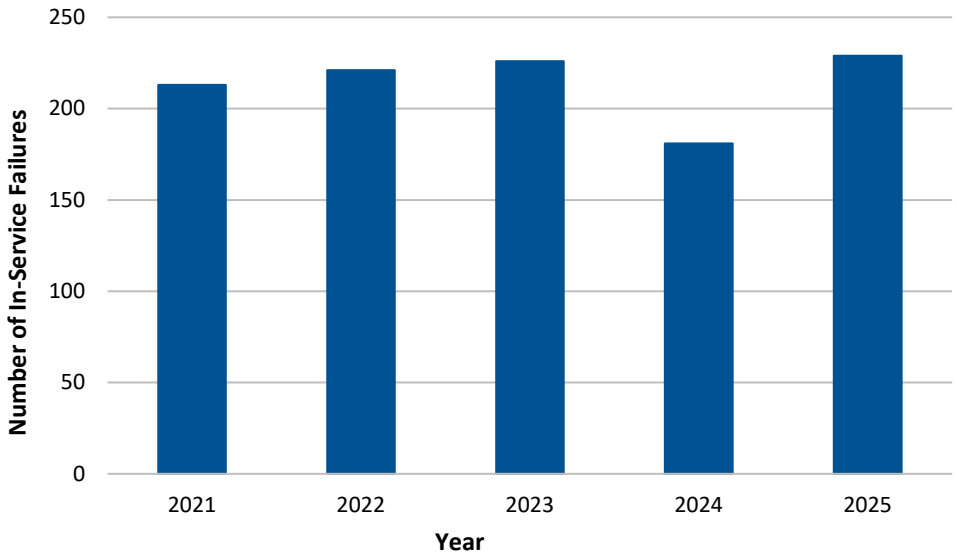


Chart 1: In-Service Failure Frequency

[3] Light-emitting diode ("LED").

4.2 Historical and Forecast Average Unit Costs

Historical and forecast program costs are provided in Chart 2 in Section 6.1. Due to the nature of this program and the range of assets covered, average unit cost information is not applicable. An increase in program cost is forecast based on the anticipated escalation of both material and labour costs, as seen in Section 6.1, Table 2.

4.3 Historical Reliability

Hydro tracks reliability data for its distribution systems and feeders using several metrics, including SAIDI,[4] SAIFI,[5] CHI,[6] CHIKM,[7] and CIKM.[8] A summary of Hydro's distribution reliability performance is provided in Section 4.0 of Schedule 1.

5.0 Analysis

5.1 Evaluation of Alternatives

Depending on the nature of each failure or incipient failure, Hydro reviews viable technical alternatives to determine the most appropriate solution to address the unplanned event while balancing safety and operational risks.

Due to the urgent nature of work executed under this program, seeking approval through a supplemental capital expenditures application or deferring the work for inclusion in the next CBA are not viable alternatives. The alternative of executing required unplanned work under the Allowance for Unforeseen Items Account is considered on a case-by-case basis, subject to the requirements set out by the Board for the use of the account.

[4] System Average Interruption Duration Index ("SAIDI"). SAIDI indicates the average length of time a customer is without power in the respective distribution system per year.

[5] System Average Interruption Frequency Index ("SAIFI"). SAIFI indicates the average number of power outages a customer has experienced in the respective distribution system per year.

[6] Customer Hours of Interruption ("CHI") is the sum of the products of the outage duration multiplied by the number of customers affected during the outage for each event within a one-year period.

[7] Customer Hours of Interruption per Kilometre ("CHIKM") is calculated by dividing the number of customer outage hours by the kilometres of feeder.

[8] Customers Interrupted per Kilometre ("CIKM") is calculated by dividing the sum of the number of customers that have experienced an outage within a one-year period by the kilometres of feeder.

5.2 Risk of Asset Stranding

Assets replaced or refurbished under this program have an inherently low risk of asset stranding. The assets covered under this program are critical to Hydro's ability to meet customer requirements. The risk of asset stranding would be considered on a case-by-case basis, if applicable.

5.3 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027 program in accordance with Hydro's Capital Risk Assessment process, as outlined in Section 7.0 of Schedule 1. The outcome of this assessment is provided in Table 1.

Table 1: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	3	5	**15**
Post-Implementation	1	1	**1**
		Risk Mitigated	**14**
		Risk Mitigated per $1 Million	**2.1**

6.0 Scope of Work

The Distribution System In-Service Failures and Miscellaneous Upgrades Program covers the annual expenditures required to upgrade Hydro's distribution systems in response to in-service failures of equipment, address localized service deficiencies, accommodate small-scale infrastructure replacements and purchase/refurbish distribution capital spares.

6.1 Program Budget

The estimate for this 2027 program is shown in Table 2. The estimate is based on the average expenditures from 2023 to 2025, and approximately $400,000 for the remaining balance of the capital spare distribution transformer purchase approved under the program in Hydro's 2025 CBA.

The details of each project covered under this program, including the associated assets and costs, as well as the total program expenditures for each year, are filed with the Board within Hydro's annual

Capital Expenditures and Carryover Report.[9] Work executed under the 2027 program will be reported to the Board in Hydro's 2027 Capital Expenditures and Carryover Report.[10]

Table 2: Program Estimate ($000)[11]

Program Cost	2027	2028	Beyond	Total
Material Supply	2,699.2	0.0	0.0	**2,699.2**
Labour	2,805.7	0.0	0.0	**2,805.7**
Consultant	0.0	0.0	0.0	**0.0**
Contract Work	518.7	0.0	0.0	**518.7**
Other Direct Costs	371.2	0.0	0.0	**371.2**
Interest and Escalation	270.3	0.0	0.0	**270.3**
Contingency	0.0	0.0	0.0	**0.0**
Total	**6,665.2**	**0.0**	**0.0**	**6,665.2**

Chart 2 provides the five-year historical program expenditures, the forecast 2026 expenditures, the proposed 2027 program budget, and the forecast budget through 2031. Since Hydro is unable to predict the quantity and nature of failures that will need to be addressed within this program in future years, the forecasted expenditures for this program are based on the 2027 program budget with cost escalation applied.

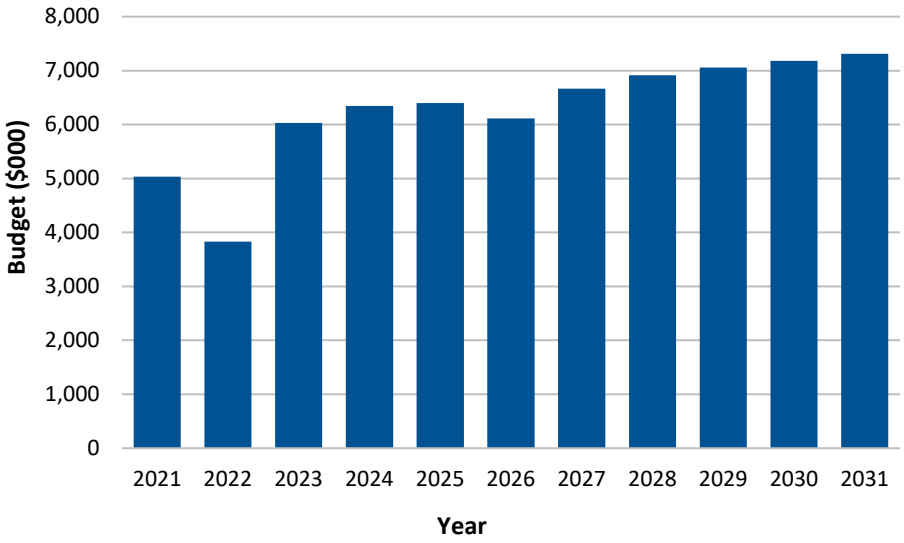


Chart 2: Historical and Forecast Program Budget

[9] Hydro's most recent Capital Expenditure and Carryover Report was filed with the Board on April 1, 2026.
[10] Hydro's 2027 Capital Expenditures and Carryover Report is to be filed on or before April 1, 2028.
[11] Numbers may not add due to rounding.

6.2 Program Schedule

Work schedules are established subsequent to an unplanned failure or incipient failure event.

7.0 Conclusion

The Distribution System In-Service Failures and Miscellaneous Upgrades Program allows Hydro to undertake timely refurbishment and replacement work that is not included in its Preventive Maintenance Program, supporting Hydro's effort to maintain safe and reliable operations, in an environmentally responsible manner. This program will also allow Hydro to continue to proactively manage the pool of capital spare equipment to maintain the integrity and reliability of the electrical system.

Provide Service Extensions

(2027)

newfoundland labrador hydro

Provide Service Extensions (2027)

Location: Various

Investment Classification: Access

Asset Category: Distribution

Estimated Cost: $5,816,700

Executive Summary

Newfoundland and Labrador Hydro ("Hydro") provides service hookups on an as-required basis using customer-driven service requests. This program provides an annual allotment for new service connections and streetlights based on past expenditures and forecasted activity within the central and northern regions of Newfoundland and throughout Labrador.

Service requests can include residential, cabin, and new business developments. Each customer requires interconnection with the local distribution service system. Service requests are received by Hydro, and plans are developed by the local regions to provide the service extensions required to meet the requests within this program.

This program will also include the relocation of distribution infrastructure at the request of customers or third parties. Service requests and relocation requests are governed by Hydro's policy respecting Contributions in Aid of Construction ("CIAC").

Hydro receives more than 500 new service requests per year; this program trend is expected to continue in the coming years.

The estimated cost for work executed under the 2027 program is $5,816,700.

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1.0 Introduction

Hydro provides direct service to more than 39,000 customers within its service areas. Hydro provides service connections on an as-required basis using customer-driven service requests. This program provides an annual allotment for new service connections and streetlights based on past expenditures and forecasted activity within the regions.

2.0 Program Description and Justification

Hydro receives service requests for both residential and general service, driven by local growth and activity within Hydro's three service regions—Central, Northern, and Labrador. Service requests can include residential, cabin, and new business developments. Each customer requires interconnection to the local distribution service system. Hydro's Customer Service Department receives service requests, and plans are developed by the local regions to provide the service extensions required to meet the requests. In addition to new service requests, Hydro occasionally receives requests from customers or third parties to relocate distribution infrastructure. Such relocations, when they arise, are addressed within this program. In some cases, CIAC funded by the requestor are required and applied for under Hydro's CIAC Policy.

While Hydro will plan the work under this program as efficiently as possible, Hydro is obligated to provide the requested services, and deferral is not an option.

3.0 Asset Overview

3.1 Asset Background

Typically, Hydro accommodates new service requests to customers as required and receives more than 500 new service requests per year. However, new service requests for the Labrador Interconnected System are governed by Hydro's approved load restriction for Labrador East and Labrador West, which limits the load growth for new services based on current transmission capacity.[1]

[1] Approved in Board of Commissioners of Public Utilities Order No. P.U. 34(2019).

4.0 Trending

4.1 Assets Installed/Replaced/Upgraded

Chart 1 shows the five-year historical, the forecast for 2026, the proposed 2027 budget, and the forecast through 2031 of new service requests received each year. The total number of new service requests for each year is comprised of those completed, on hold, and cancelled.

The historical data for 2021–2025, shows that the number of new service requests received continues to trend above 500. This program trend is expected to continue in the coming years.

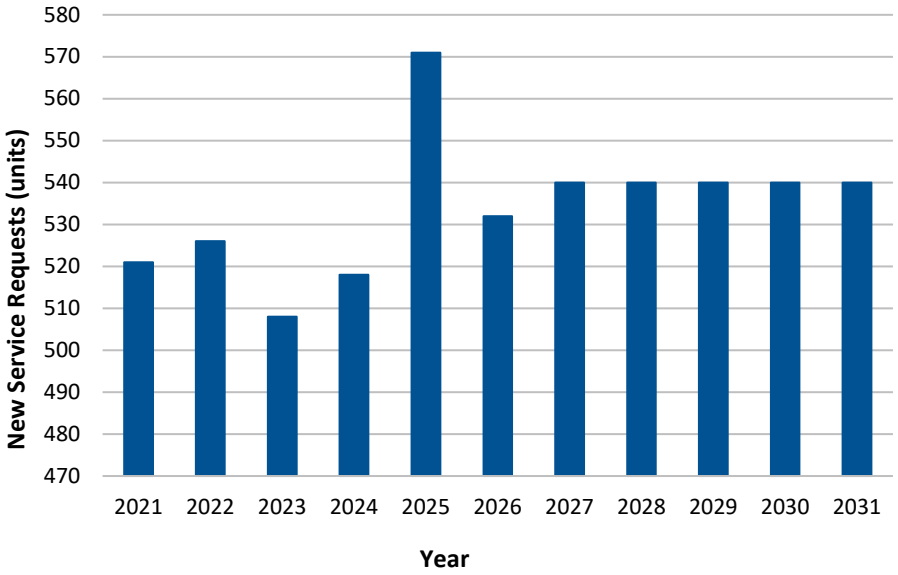


Chart 1: Historical and Forecast New Service Requests Received

4.2 Historical and Forecast Average Unit Costs

As this is a customer-driven program that includes a range of scopes and costs, actual historical per unit costs per year tend to fluctuate. Forecast 2027 costs are based on the average expenditures from 2023–2025. Costs per service request vary greatly depending on the nature of the request and the magnitude of infrastructure modifications required to accommodate the request. To provide the

average unit cost as required by the provisional Capital Budget Application ("CBA") Guidelines,[2] Hydro has aggregated its annual data to provide an estimated unit cost for each year, as shown in Chart 2.[3]

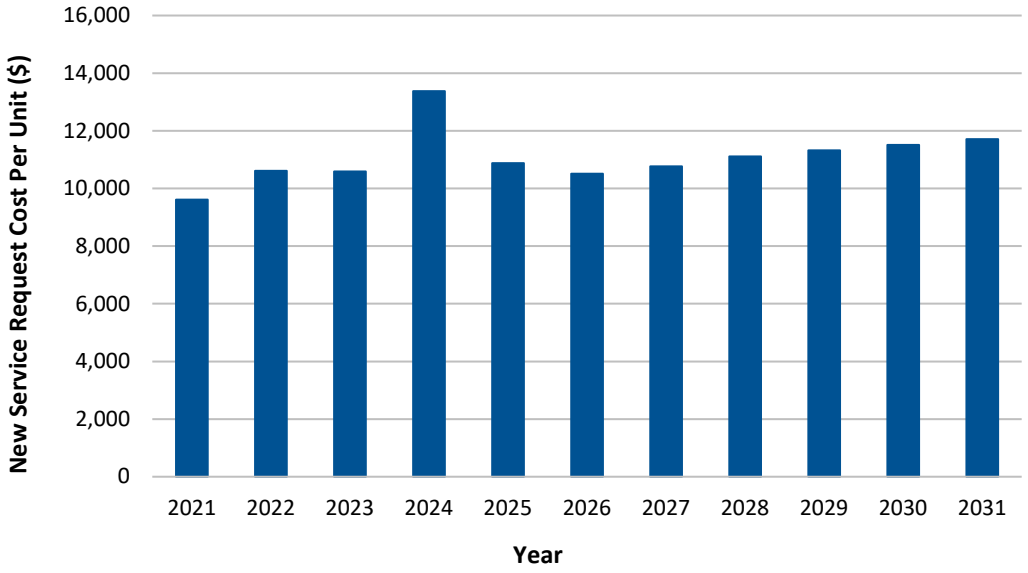


Chart 2: Historical and Forecast Average Unit Cost per New Service Request Completed

4.3 Recommended Alternative

Hydro is obligated to provide service extensions upon request. During the technical review of individual requests, viable alternatives will be considered where appropriate.

4.3.1 Risk of Asset Stranding

Although generally not applicable to this program, Hydro would consider the risk of asset stranding in the context of individual requests. Temporary requests for service are governed by Hydro's Schedule of Rates, Rules and Regulations and the CIAC Policy.

[2] "Capital Budget Application Guidelines (Provisional)," Board of Commissioners of Public Utilities, January 2022.
[3] As per Hydro's response to request for information PUB-NLH-043 of the 2025 CBA, Hydro performed queries to test the availability and granularity of work order data to determine what additional data or processes would be required to calculate the cost per new service request. As queries were unable to produce an exact historical cost per new service request, Hydro has provided an estimate of its unit cost accordingly.

5.0 Scope of Work

Work executed under this program involves the installation of new service connections and streetlights on an as-required basis throughout Hydro's service areas. On average, Hydro receives over 500 requests for new service connections per year with varying scopes of work.

5.1 Program Budget

The estimate for this program is shown in Table 1.

Table 1: Program Estimate ($000)

Program Cost	2027	2028	Beyond	Total
Material Supply	1,795.3	0.0	0.0	**1,795.3**
Labour	2,888.3	0.0	0.0	**2,888.3**
Consultant	0.0	0.0	0.0	**0.0**
Contract Work	533.3	0.0	0.0	**533.3**
Other Direct Costs	362.9	0.0	0.0	**362.9**
Interest and Escalation	236.9	0.0	0.0	**236.9**
Contingency	0.0	0.0	0.0	**0.0**
Total	**5,816.7**	**0.0**	**0.0**	**5,816.7**

Chart 3 shows the five-year historical expenditures, the forecast 2026 expenditures, the proposed 2027 program budget, and the forecast costs through 2031. Hydro has forecast future expenditures for this program based on the 2027 program budget with cost escalation applied.

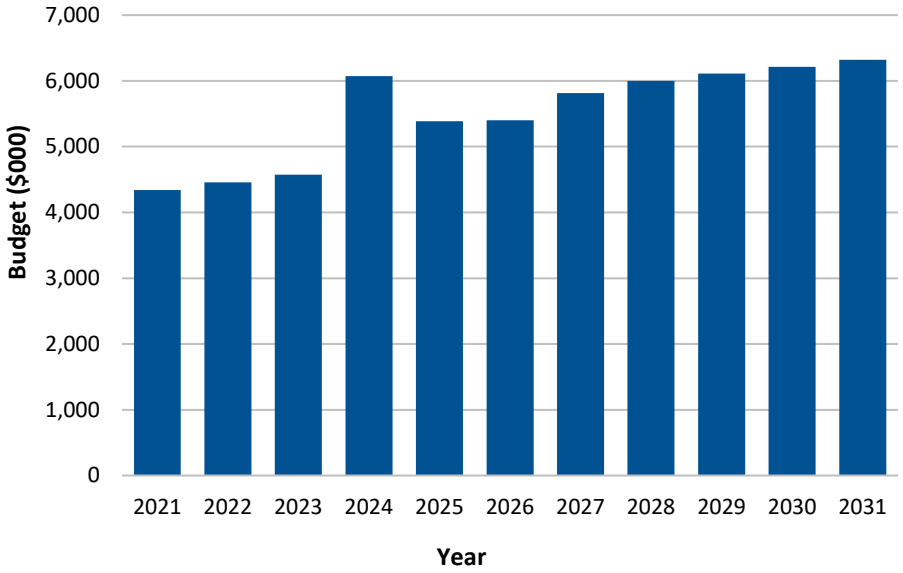


Chart 3: Historical and Forecast Program Budget

5.2 Program Schedule

New service requests are customer-driven and are ongoing throughout the year.

6.0 Conclusion

Hydro provides service connections on an as-required basis using customer-driven service requests in its service areas. This program provides an annual allotment, adjusted yearly, based on the average expenditure over the past three years for Hydro's connection of new residential and general service requests and distribution infrastructure relocation.

Thermal In-Service Failures

(2027)



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Thermal In-Service Failures (2027)

Location: Holyrood

Investment Classification: Renewal

Asset Category: Thermal Plant

Estimated Cost: $3,836,400

1.0 Introduction

Newfoundland and Labrador Hydro ("Hydro") conducts asset management activities to proactively identify, replace, repair, or refurbish equipment to minimize the disruption of service and to avoid unsafe working conditions due to equipment failure. An objective of Hydro's Asset Management Program is to identify refurbishment and replacement activities that require approval by the Board of Commissioners of Public Utilities ("Board") in time to be included in Hydro's annual capital budget application ("CBA"). This is achieved through the Preventive Maintenance Program using various condition-based assessments and testing procedures.

Hydro has had success in projecting the deterioration rate of equipment for submission of refurbishment or replacement work into CBAs. However, there are situations where immediate refurbishment or replacement must be completed due to the occurrence of an actual failure, the identification of an incipient failure, or the determination of faster-than-anticipated equipment deterioration. These situations can be caused by events such as vandalism, storm damage, lightning, accidental damage, abnormal system operations, cavitation, corrosion, and wear of mechanical components. Hydro uses historical data and engineering judgment to predict the magnitude of these in-service failure expenditures.

As identified through the Reliability and Resource Adequacy Study – 2022 Update ("2022 Update"),[1] the Holyrood Thermal Generating Station ("Holyrood TGS") shall remain available for a Bridging Period[2] until

[1] "Reliability and Resource Adequacy Study – 2022 Update," Newfoundland and Labrador Hydro, October 3, 2022.
[2] Hydro considers the Bridging Period to be from the present to 2030 or until such time that sufficient alternative generation is commissioned, adequate performance of the Labrador-Island Link ("LIL") is proven, and generation reserves are met. During the Bridging Period, the system would rely primarily on existing sources of generation capacity to maintain reliability while new generation capacity is being built. The primary, readily available supply options in this period are extending the retirements of the Holyrood TGS, Stephenville Gas Turbine and the Hardwoods Gas Turbine until their capacities can be adequately replaced.

2030. At this time, capital investment related to the generation function of the Holyrood TGS is necessary to support system reliability and maintain Hydro's ability to meet customer demand during peak periods.

2.0 Program Description and Justification

Due to the nature of thermal generating infrastructure, unanticipated failures and deterioration will occur. Under the Thermal In-Service Failures Program, Hydro is proposing to undertake the immediate capital refurbishment and replacement work required to maintain the safe and reliable operation of the Holyrood TGS and to ensure the availability of capital spares required to complete this work. Deferral of work that is justified under this program could result in a detrimental impact to customer power supply or unacceptable risk to worker or public safety. Required work will be evaluated to determine the appropriate form of execution as an in-service failure, an allowance for unforeseen item or a supplemental project.

At this time, Hydro does not have any planned capital spare acquisitions under this program. Throughout 2027, Hydro may purchase capital spares identified by asset management personnel as requiring immediate procurement to offset deficiencies in its capital spares inventory, and to account for increasing long lead times for equipment.

3.0 Asset Overview

3.1 Asset Background

The assets requiring immediate, unplanned replacement or refurbishment work in a given year cannot be identified in advance.

For further information on the work executed under the Thermal In-Service Failures (2025) Program that individually exceeded $750,000, please refer to Hydro's "Capital Expenditures and Carryover Report for the Year Ended December 31, 2025."[3]

3.2 Asset Condition

Assets replaced or refurbished under this program have experienced unexpected failure or exhibit signs of incipient failure; therefore, these assets have reached the end of their serviceable life.

[3] Provided as Appendix B to Schedule 5 of this application.

3.3 Asset Ages

The age of assets potentially covered under this program varies. Unplanned refurbishment or replacement activities due to failure or incipient failure may be necessary at any time during the asset life cycle.

4.0 Trending

Hydro implemented the Thermal In-Service Failures Program in 2018. Over the past five years, on average Hydro has executed 34 unplanned projects per year under the program.

4.1 Assets Installed/Replaced/Upgraded

The number of unplanned In-Service Failures projects initiated under the program over the past five years is provided in Chart 1. Hydro anticipates that in-service failures will continue to occur, given the age and number of thermal assets covered under this program. Hydro continues to plan the budget for this program based on historical information.

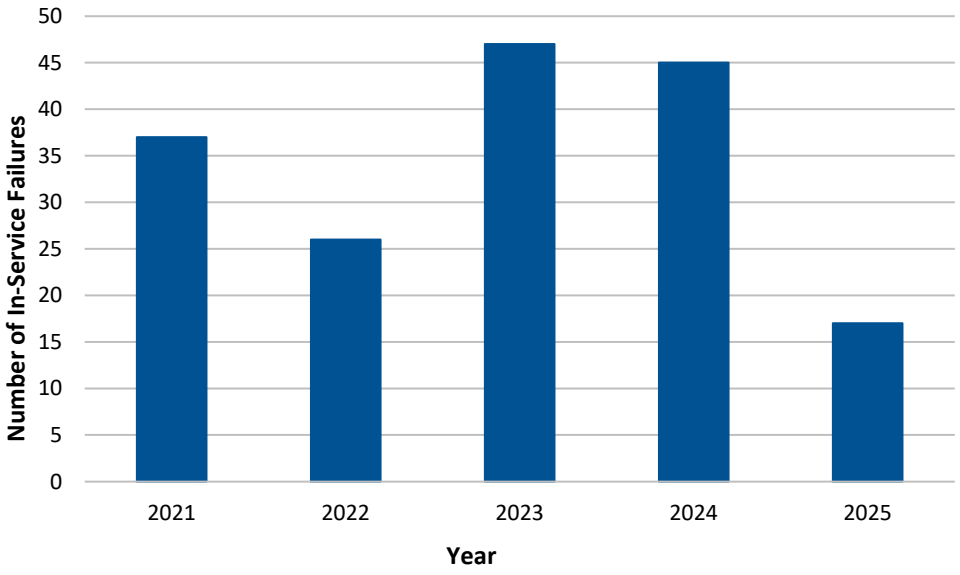


Chart 1: In-Service Failure Frequency

4.2 Historical and Forecast Average Unit Costs

Historical and forecast program costs are provided in Chart 2 in Section 6.1. Due to the nature of this program and the range of assets covered, average unit cost information is not applicable.

4.3 Historical Reliability

Hydro tracks performance data for its thermal generation units using the Derated Adjusted Forced Outage Rate ("DAFOR").[4,5] This program plays a key role in allowing Hydro to minimize the DAFOR of its thermal generation units to ensure the provision of reliable service to customers.

In its 2024 Near-Term Reliability Update,[6] Hydro's modelling indicated that a Derated Adjusted Utilization Forced Outage Probability ("DAUFOP")[7] in excess of 20%, coupled with a LIL forced outage rate of 5% would result in a violation of Hydro's generation planning criteria.[8] This program ensures Hydro can address failing components quickly to minimize forced outages that could impact the system.

5.0 Analysis

5.1 Evaluation of Alternatives

Depending on the nature of each failure or incipient failure, Hydro reviews viable technical alternatives to determine the most appropriate solution to address the unplanned event while balancing urgent safety and operational risks.

Due to the urgent nature of work executed under this program, seeking approval through a supplemental capital expenditures application or deferring the work for inclusion in the next CBA are not viable alternatives. The alternative of executing required unplanned work under the Allowance for Unforeseen Items Account is also considered on a case-by-case basis, subject to the requirements set out by the Board for use of the account.

[4] "Quarterly Report on Asset Performance in Support of Resource Adequacy for the Twelve Months Ended March 31, 2026," Newfoundland and Labrador Hydro, May 4, 2026.
[5] DAFOR is a metric that measures the percentage of time that a unit or group of units is unable to generate at its maximum continuous rating due to forced outages or unit deratings.
[6] "Reliability and Resource Adequacy Study Review – 2024 Near-Term Reliability Report," Newfoundland and Labrador Hydro, November 20, 2024.
[7] DAUFOP is the probability that a generating unit will not be available due to forced outages or forced deratings when there is demand on the unit to generate.
[8] "2024 Resource Adequacy Plan – An Update to the Reliability and Resource Adequacy Study," Newfoundland and Labrador Hydro, rev. August 26, 2024 (originally filed July 9, 2024), app. B, Table 7, p. 35.

5.1.1 Risk of Asset Stranding

The risk of asset stranding is less imminent as a result of the decision to extend Holyrood TGS to remain available through the Bridging Period. Depreciation is required to be calculated on an accelerated basis (i.e., monthly depreciation = capital investment ÷ remaining months of service life).[9]

5.1.2 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027 program in accordance with Hydro's Capital Risk Assessment process as outlined in Section 7.0 of Schedule 1. The outcome of this assessment is provided in Table 1.

Table 1: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	3	5	**15**
Post-Implementation	3	1	**3**
		Risk Mitigated	**12**
		Risk Mitigated per $1 Million	**3.1**

6.0 Scope of Work

6.1 Program Budget

The estimate for this program is shown in Table 2. The estimate is based on the average expenditures from 2023 to 2025. The details of each project covered under this program that individually exceeded $750,000, including the associated assets and costs, as well as the total program expenditures for each year, are filed with the Board within Hydro's annual Capital Expenditures and Carryover Report.[10] Work executed under this program in 2027 that individually exceed $750,000 will be reported to the Board in Hydro's 2027 Capital Expenditures and Carryover Report.[11]

[9] Due to the extension of the Holyrood TGS through the Bridging Period, Hydro submitted an application to the Board to extend the Holyrood Accelerated Depreciation Deferral Account. The extension of the account and related amendments were approved in Board Order No. P.U. 1(2024). In accordance with Board direction, Hydro filed a report on the activity and operation of the deferral account in its 2026 General Rate Application.

[10] Hydro's most recent Capital Expenditures and Carryover Report was filed with the Board on April 1, 2026.

[11] Hydro's 2027 Capital Expenditures and Carryover Report is to be filed on or before April 1, 2028.

Table 2: Program Estimate ($000)

Program Cost	2027	2028	Beyond	Total
Material Supply	1,100.0	0.0	0.0	1,100.0
Labour	1,085.6	0.0	0.0	1,085.6
Consultant	80.0	0.0	0.0	80.0
Contract Work	1,435.0	0.0	0.0	1,435.0
Other Direct Costs	0.0	0.0	0.0	0.0
Interest and Escalation	135.8	0.0	0.0	135.8
Contingency	0.0	0.0	0.0	0.0
Total	**3,836.4**	**0.0**	**0.0**	**3,836.4**

The Thermal In-Service Failures Program started in 2018. Chart 2 provides the five-year historical program expenditures, the forecast 2026 expenditures, the proposed 2027 budget, and the forecast costs through 2031.[12] Since Hydro is unable to predict the quantity and nature of failures that will need to be addressed within this program in future years, the forecasted expenditures for this program are based on the 2027 program budget with cost escalation applied.[13]

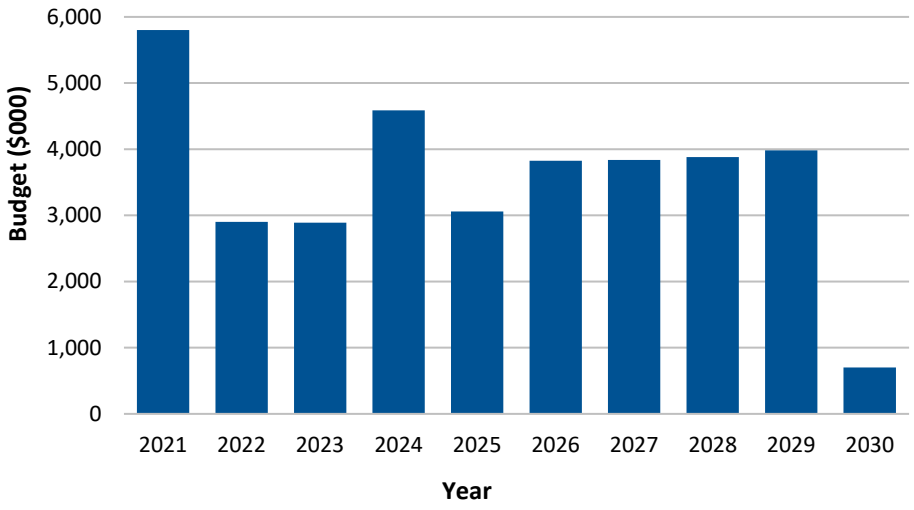


Chart 2: Historical and Forecast Program Budget

[12] The forecast for the costs of the thermal in-service failures was based on the assumption of continued operation of all generating units at the Holyrood TGS through the Bridging Period until its capacity can be adequately replaced. Hydro's capital projections assume all three generating units remain online until 2030. These projections are subject to change based on changes in operating regime.

[13] Forecast in 2030 is less than $1 million, and assumes retirement of three generating units as of March 31, 2030.

6.2 Program Schedule

Work schedules are established subsequent to an unplanned failure or incipient failure event. There are currently no planned capital spare acquisitions under this program for 2027.

7.0 Conclusion

The Thermal In-Service Failures Program allows Hydro to undertake timely refurbishment and replacement work that is not included in its Preventive Maintenance Program, supporting Hydro's effort to maintain safe and reliable operations in an environmentally responsible manner. This program will also allow Hydro to continue to proactively manage the pool of capital spare equipment to maintain the integrity and reliability of the electrical system.

Replace Light-Duty Vehicles

(2027–2028)

newfoundland labrador hydro

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Replace Light-Duty Vehicles (2027–2028)

Location: Various

Investment Classification: General Plant

Asset Category: Transportation

Estimated Cost: $3,827,500

1.0 Introduction

Newfoundland and Labrador Hydro ("Hydro") operates a fleet of vehicles including approximately 240 light-duty vehicles distributed across Hydro's operating areas throughout the province. This fleet is utilized daily to support staff engaged in the operation and maintenance of the electrical system.

Under this program, Hydro is proposing the replacement of light-duty vehicles in accordance with Hydro's replacement criteria.

2.0 Program Description and Justification

Hydro operates its fleet of light-duty vehicles as required to maintain the safety and reliability of the electrical system.

Hydro's key replacement criteria for light-duty vehicles are provided in Table 1. In addition to age and odometer readings, asset condition and the criticality of the unit to Hydro's operations are also considered in determining whether a vehicle should be replaced in a given year.

Table 1: Replacement Criteria

Vehicle	Replacement Criteria
Light-Duty	Seven years or 200,000 kilometres (odometer reading), dependent on condition/maintenance cost and reliability.

Historically, the replacement of light-duty vehicles was part of a larger program scope that also included heavy-duty vehicles, such as single-axle and tandem-axle trucks. In Board of Commissioners of Public Utilities ("Board") Order No. P.U. 28(2024), approving Hydro's 2025 Capital Budget Application ("CBA"), the Board had noted concerns with including scopes of light- and heavy-duty vehicles in the same program, stating:

> The Board finds that Hydro has not provided sufficient justification for the combining of light- and heavy-duty vehicles/assets. While there may be some efficiencies gained in grouping the different types of vehicles/assets together, the Board finds that separation will allow for greater transparency, clarity, and better reflect delivery time and cost.[1]

Upon further review of the program scopes and consideration of the Board's request, Hydro has separated light- and heavy-duty vehicles into separate proposals, beginning with the 2026 CBA.

3.0 Asset Overview

3.1 Asset Background

Entering 2027, the composition of Hydro's light-duty fleet is forecast to include approximately 178 pickup trucks, 21 specialized box vans, and 41 small vehicles, including SUVs,[2] cars, and minivans.[3]

On average, Hydro's vehicles accumulate 25,000–30,000 kilometres per year or 175,000–210,000 kilometres over the seven-year life of the vehicle. On occasion, some vehicles accumulate higher than average mileage, while other vehicles accumulate lower than average mileage which serves to extend the service life of the vehicle.

In Hydro's experience, its vehicle replacement criteria is appropriate and results in the least-cost replacement of its light-duty fleet. Hydro also monitors vehicle replacement practices of other Canadian utilities, as well as statistics on Hydro's own vehicle usage rates, to ensure Hydro's criteria and vehicle replacement rates appropriately reflect Hydro's operational needs.

3.2 Asset Condition

As equipment ages, failures are more likely to occur. In addition, light-duty vehicles often experience accelerated wear and tear due to their operation in rough terrain, as well as premature corrosion from exposure to salt spray. These factors result in an increase in the amount of downtime required for repair. Increased downtime in Hydro's fleet can negatively impact response times to customer outages as well as Hydro's ability to undertake planned maintenance activities.

[1] Board Order No. P.U. 28(2024), p. 7/19–22.
[2] Sport utility vehicle.
[3] Fleet numbers may vary year-to-year depending on the specific timing of vehicle replacements and retirements.

Light-duty vehicles are inspected in accordance with the preventive maintenance schedule, and all maintenance and repairs are performed by third-party service providers as needed. This helps to ensure that the maximum potential reliable service life is achieved.

If an asset has reached one of the replacement criteria shown in Table 1, the asset will be assessed to determine if the service life of the asset can be safely and reliably extended and remain part of the fleet.

3.3 Condition-Based Remaining Life

Vehicles that have reached one or more replacement criteria, but have been determined to be suitable for a service life extension, are assessed by Hydro to determine the most appropriate assignment for the asset. For example, the asset may be reassigned to an area where less mileage is expected to occur, or where the operating conditions for the vehicle are less severe.

3.4 Asset Ages

Chart 1 provides the light-duty vehicle asset age of the fleet, including those proposed for replacement. For light-duty vehicles, the average age of the fleet in 2027 is approximately five years. Replacements of vehicles in the zero to five-year age range category are typically a result of the vehicle meeting the mileage and condition.

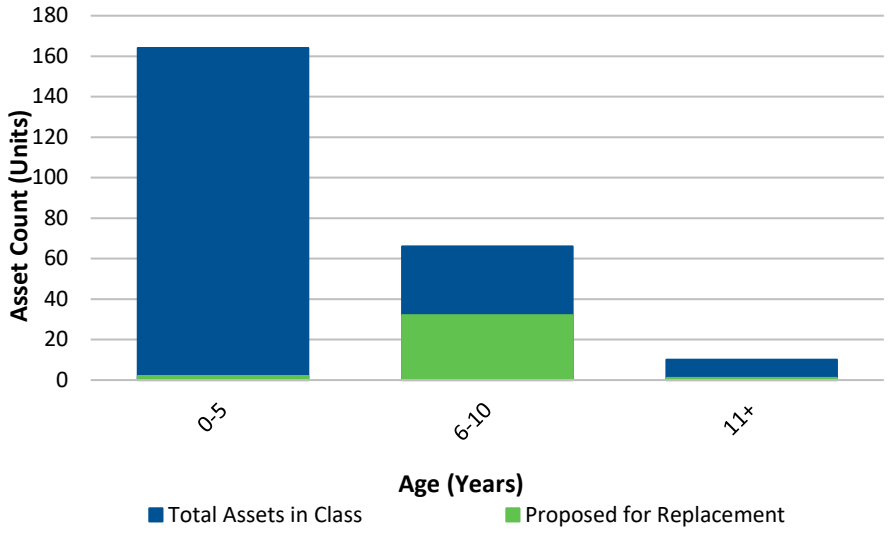


Chart 1: Asset Counts by Asset Age[4]

[4] Hydro evaluates assets as they reach retirement criteria to determine if it is appropriate to extend the life of the vehicles. Those extended beyond ten years of age, are generally in good condition and have not yet met the mileage milestone.

4.0 Trending

4.1 Assets Installed/Replaced/Upgraded

Chart 2 provides the five-year historical, current, and five-year forecast number of light-duty vehicles replaced under this program. The number of assets replaced in 2021 was below average due to global supply chain challenges. The number of replacements in 2026 was higher than average, primarily due to a lag in the delivery of orders that were placed in the preceding year. The forecast for the number of assets to be replaced future years is based on the outcome of Hydro's review of the average age versus service life as discussed in Section 3.4.

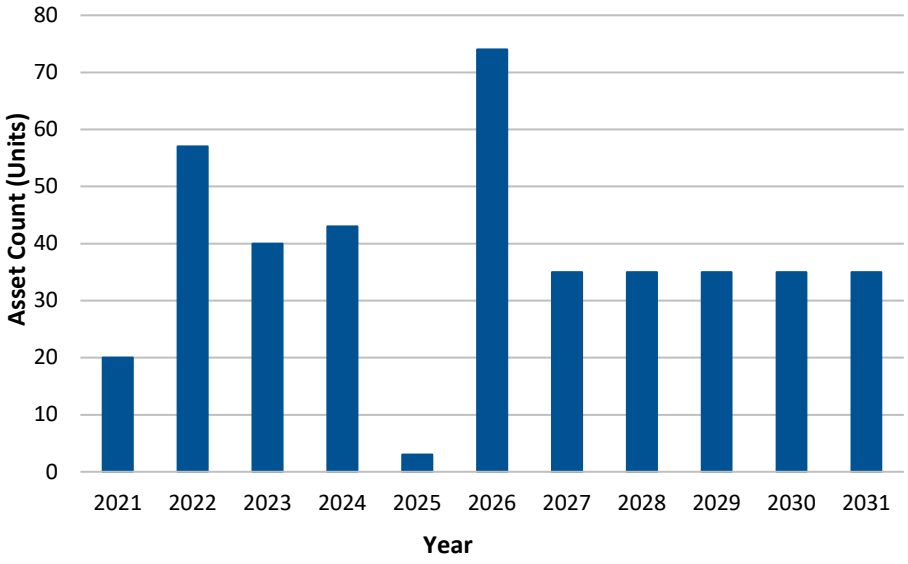


Chart 2: Historical and Forecast Number of Assets Installed/Replaced/Upgraded

4.2 Historical and Forecast Average Unit Costs

Chart 3 indicates the average historical and forecast unit replacement cost for Hydro's light-duty vehicles. The average unit cost of light-duty vehicles varies from year to year, and this variation is largely attributed to cost increases in this segment since 2021, economic factors such as tariffs, as well as the specific type of light-duty vehicles procured in a given year.

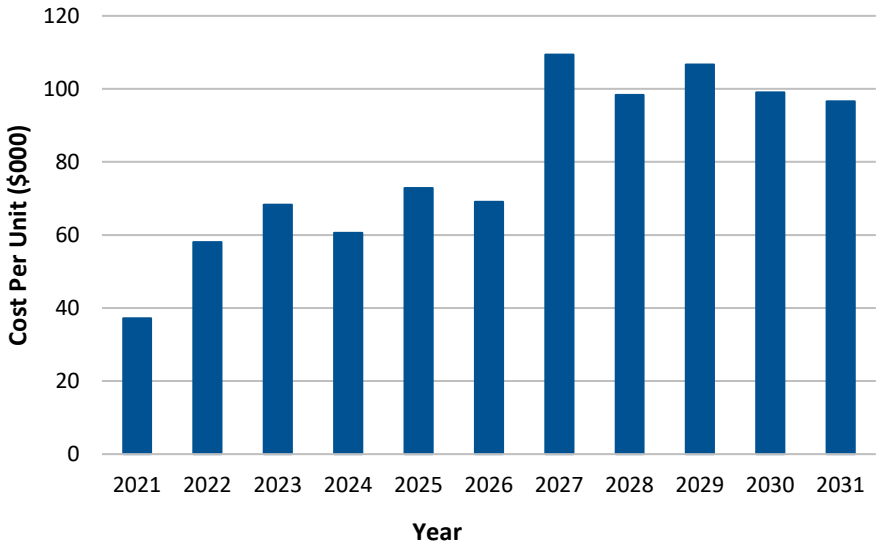


Chart 3: Historical and Forecast Average Unit Costs of Assets Installed/Replaced/Upgraded

4.3 Historical Reliability

Light-duty vehicles are inspected in accordance with the preventive maintenance schedule. All maintenance and repairs are performed by third-party service providers, as needed.

5.0 Analysis

5.1 Evaluation of Alternatives

Hydro considered the following alternatives:

- Pace reduction;
- Pace advancement;
- Continue program at current pace; and
- Alternative strategies – vehicle rentals.

5.1.1 Pace Reduction

In 2020, Hydro re-evaluated its replacement criteria and reduced the pace of replacement based on a review of industry standards and the condition of the units upon replacement. Based on Hydro's experience, reducing the pace of replacements presents reliability risks. This is confirmed by the unplanned pace reduction in vehicle replacements imposed by supply chain constraints since 2020. The

reduced replacement rate resulted in an increased rate of vehicle failure which has challenged Hydro's ability to complete required work. For this reason, pace reduction is not considered a viable option.

5.1.2 Pace Advancement

Advancing the pace of this program may result in the premature retirement of existing, functional assets, requiring a level of investment which is in excess of the costs required for the delivery of safe, reliable least-cost power, in an environmentally responsible manner. For this reason, pace advancement is not considered a viable option.

5.1.3 Continuation of Program at Current Pace

Hydro has determined that the current replacement criteria are appropriate based on consultation with other utilities, the condition of the units upon replacement, and vehicle usage statistics. This approach allows Hydro to balance cost with the reliability of its vehicle fleet. These vehicles are necessary to facilitate required maintenance as well as to enable Hydro's timely response to system events. As such, the vehicles must be available and in appropriate working condition.

5.1.4 Alternative Strategies – Vehicle Rentals

Hydro supplements its fleet vehicle needs with rental vehicles, where practical; however, vehicles in this segment are frequently unavailable. Additionally, much of Hydro's light-duty fleet is customized to industrial work usage to the extent that there is no direct replacement option possible from the rental market. As such, Hydro does not consider this a viable alternative for this program.

5.2 Least-Cost Evaluation

Hydro has not identified any viable alternatives to facilitate a least-cost evaluation.

5.3 Recommended Alternative

Hydro's recommended alternative is to continue the program at the current pace and proceed with the identified replacements based on its replacement criteria.

5.3.1 Risk of Asset Stranding

This program is necessary to maintain a safe and reliable fleet. Failure to replace this equipment will lead to increased maintenance costs, less reliable equipment, delays in scheduled and unscheduled

work, and potential safety issues for operators. Hydro does not foresee any changes in its requirements for light-duty vehicles; therefore, the risk of asset stranding is low.

5.3.2 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027–2028 program in accordance with Hydro's Capital Risk Assessment process as outlined in Section 7.0 of Schedule 1. The outcome of this assessment is provided in Table 2.

Table 2: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	3	4	**12**
Post-Implementation	3	1	**3**
		Risk Mitigated	**9**
		Risk Mitigated per $1 Million	**2.4**

6.0 Scope of Work

This program proposes the replacement of 35 light-duty vehicles in accordance with Hydro's replacement criteria. This scope includes the procurement of the vehicles and accessorizing as required, based on the purpose of the vehicle.[5] This program also includes $100,000 in 2027 to address in-service failures for fleet vehicles. Hydro will evaluate the cost of repair or refurbishment versus replacement prior to executing in-service failure repairs.

6.1 Program Budget

The estimate for this program is shown in Table 3.

Table 3: Program Estimate ($000)

Program Cost	2027	2028	Beyond	Total
Material Supply	2,465.0	550.0	0.0	**3,015.0**
Labour	51.1	5.1	0.0	**56.2**
Consultant	0.0	0.0	0.0	**0.0**
Contract Work	0.0	0.0	0.0	**0.0**
Other Direct Costs	18.7	3.8	0.0	**22.5**
Interest and Escalation	91.1	31.8	0.0	**122.9**
Contingency	500.0	110.9	0.0	**610.9**
Total	**3,125.9**	**701.6**	**0.0**	**3,827.5**

[5] Where appropriate, Hydro will consider electric vehicles during the procurement process. Vehicles will be selected based on their suitability for their intended purpose, as well as life-cycle cost.

Recent implementation and adjustments of tariffs on vehicles, as well as the prices of components and materials used to fabricate vehicles, have increased uncertainty and volatility in the unit price of these assets. To mitigate these uncertainties, Hydro has increased the amount of contingency to approximately 20%. The contingency budget for the purchase of vehicles includes approximately 10% to accommodate potential price increases relating to various market factors. As price effects relating to tariffs become more apparent, and in cases where tariffs are adjusted in the future, Hydro will reevaluate the amount of contingency included in future vehicle replacement budgets.

Light-duty vehicles will be requisitioned and received in 2027–2028. Light-duty vehicles are replaced based on age, accumulated kilometres, and condition; as such, the types of vehicles replaced will vary from year to year. Chart 4 provides the five-year historical program expenditures, the forecast 2026 expenditures, the proposed 2027–2028 program budget, and the forecast budget through 2031.

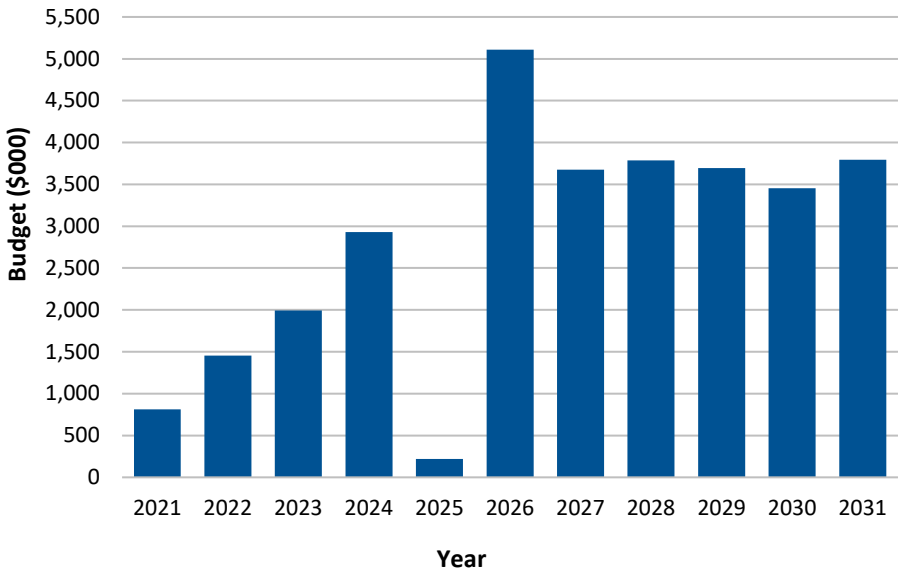


Chart 4: Historical and Forecast Program Budget

6.2 Program Schedule

The schedule for this program is shown in Table 4.

Table 4: Program Schedule

Activity	Start Date	End Date
Planning: Open work orders, plan, and develop detailed schedules.	February 2027	February 2027
Procurement: Tender and award contracts to purchase light-duty vehicles.	March 2027	April 2027
Commissioning: Receive and commission light-duty vehicles.	May 2027	July 2028
Closeout: Close work orders, complete all documentation, and complete lessons learned.	August 2028	September 2028

7.0 Conclusion

Hydro operates a fleet of light-duty vehicles to enable effective maintenance of the electrical system and timely response to system events. Failure to replace the equipment will lead to increased maintenance costs, less reliable equipment, and safety concerns for all users.

The established replacement guidelines have been determined to be appropriate. Hydro proposes to continue with the replacement of vehicles under this program for 2027–2028.

Renew Diesel Units

(2027)



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Renew Diesel Units (2027)

Location: Various

Investment Classification: Renewal

Asset Category: Generation

Estimated Cost: $3,642,000

1.0 Introduction

Newfoundland and Labrador Hydro ("Hydro") has 24 diesel generating stations, serving approximately 4,500 customers. Of these stations, 19 are isolated and are the sole source of power to a community. The number of diesel generation units ("genset") at each generating station ranges from three to six, while the rated output of the units ranges from 40 kW to 2,500 kW. The gensets across the system range in age from less than one year to 55 years, and operating hours currently range from 208 hours to over 110,758 hours.[1]

In previous iterations of this program, Hydro has overhauled diesel gensets at Original Equipment Manufacturer ("OEM") recommended intervals. In recent years, it has been Hydro's experience that component replacement has become more effective than overhauls in terms of cost, execution, and schedule. Hydro has seen an increasing trend of failure of parts shortly after their return to service upon completion of an overhaul. Additionally, overhauls take approximately three months to complete, whereas genset replacements take five to ten days.

Based on this experience, in 2027, the program to Renew Diesel Units[2] will consider the alternative of overhaul or replacement for each required renewal activity at the estimate stage, and confirm the approach during program execution. These alternatives will be evaluated based on the type of unit, availability of parts, and overall cost.

The genset models proposed for renewal within this program in 2027 are anticipated to reach or exceed the maximum number of operating hours for recommended intervention based on the rotational speed of the unit. All of Hydro's gensets operate at either 1,200 rpm or 1,800 rpm.

[1] As of December 2025.
[2] In prior capital budget applications, this program was titled "Overhaul Diesel Units".

2.0 Program Description and Justification

Hydro's diesel generating stations are often isolated and, in most cases, are the sole sources of power to a community. This program is required to maintain the reliable operation of the components of these stations. Hydro maintains renewal schedules at 20,000 operating hours for 1,800 rpm engines and 30,000 operating hours for 1,200 rpm engines, based on the reliable performance and the condition of parts observed during previous overhauls. To defer or skip an interval would increase the risk of an engine or generator failure, resulting in reduced reliability of the generating station and an increased likelihood of customer outages. Hydro is proposing to renew seven diesel units as part of this program in 2027.

While Hydro occasionally advances diesel unit work when required based on unit condition, the units proposed under this program in 2027 are due to reach 30,000 operating hours for 1,200 rpm units, or 20,000 operating hours for 1,800 rpm units in that year. These units include:[3]

- Hopedale Diesel Unit 2054;
- St. Lewis Diesel Unit 2080;
- Cartwright Diesel Unit 2086;
- Postville Diesel Unit 2096;
- Cartwright Diesel Unit 594;
- Francois Diesel Unit 588; and
- McCallum Diesel Unit 2064.

3.0 Asset Overview

3.1 Asset Background

A diesel genset is a combination of a diesel engine with an electric alternator[4] used to generate electrical energy as shown in Figure 1.

[3] Unit hours can change based on system and loading conditions, and on occasion, a unit in one of the diesel generating stations across Hydro's operating area will experience an issue that necessitates an unplanned intervention, or will reach the number of operating hours earlier than anticipated. Where appropriate, Hydro may complete such work under this program and, if possible, defer one of the planned units.

[4] An alternator is an electric generator that converts mechanical energy to electrical energy in the form of alternating current.

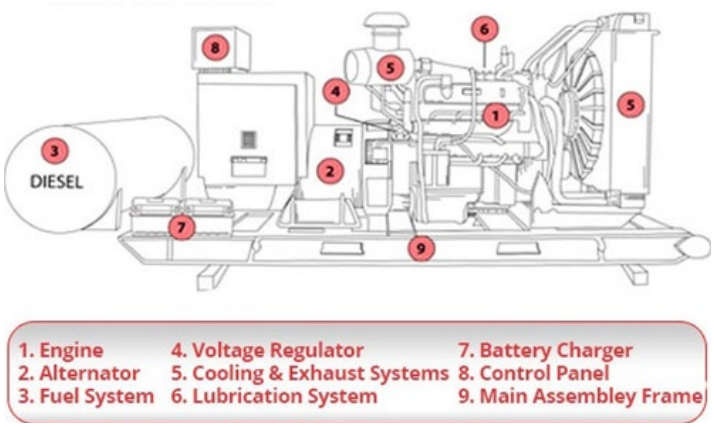


Figure 1: Diesel Genset

Gensets can be classified in one of three ways, depending on their mode of operation: continuous, prime, or standby/emergency. Continuous and prime gensets are very similar—they both function as a main source of power and are designed to operate continuously or for extended periods. The major difference between the two is that continuous gensets are designed to operate continually with a consistent load, while prime gensets are designed to operate for long durations at variable loads. Standby/emergency gensets are to be run only when there is an outage or in a backup situation. Hydro purchases prime power gensets based on the mode of operation for use in its isolated locations.

3.2 Asset Condition

The units proposed for intervention in 2027, and the associated operating hours remaining before intervention, are provided in Table 1.

Table 1: Planned 2027 Unit Overhauls – Asset Condition

Engine	Operating Hours Remaining Before Intervention[5]	RPM
Hopedale Diesel Unit 2054	5,623	1,200
St. Lewis Diesel Unit 2080	8,351	1,800
Cartwright Diesel Unit 2086	6,171	1,800
Postville Diesel Unit 2096	440	1,800
Cartwright Diesel Unit 594	9,407	1,200
Francois Diesel Unit 588	12,470	1,800
McCallum Diesel Unit 2064	8,824	1,800

3.3 Condition-Based Remaining Life

Generally, Hydro does not replace diesel units until they reach 120,000 operating hours for 1,200 rpm units, or 100,000 operating hours for 1,800 rpm units. Unit interventions are required to ensure diesel units operate reliably for the duration of their useful lives.

Hopedale Diesel Unit 2054 will be replaced prior to reaching 120,000 operating hours for a 1,200 rpm unit, as due to the unit type and obsolescence of parts, it is least-cost to replace the genset in its entirety.

3.4 Asset Ages

Diesel units across Hydro's system range in age from less than one year to 55 years, and currently range in operating hours from 208 hours to over 110,758 hours. The gensets proposed under this program were determined based on the number of operating hours.

Chart 1 provides ages for all assets covered under the program.

[5] As of December 31, 2025.

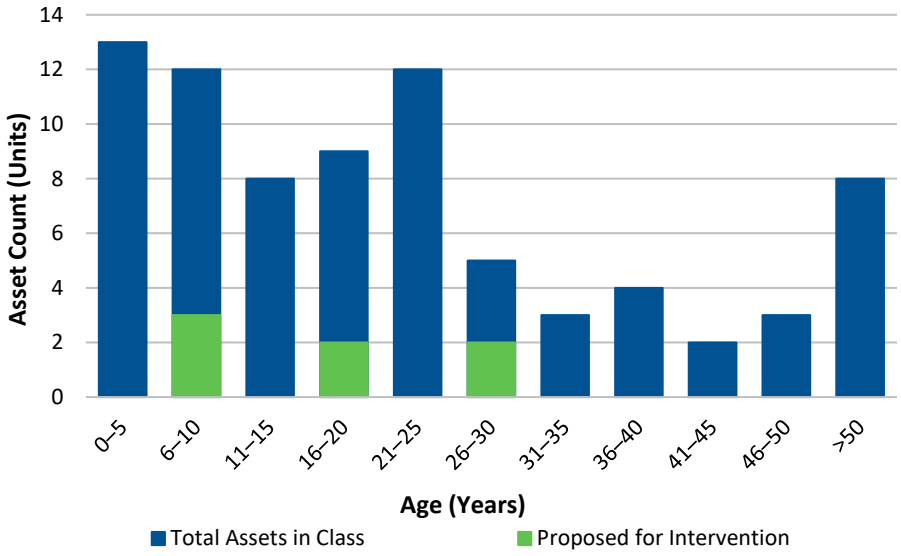


Chart 1: Asset Counts by Asset Age

4.0 Trending

Hydro's Overhaul Diesel Units Program was implemented in 2012. During the most recent five-year interval from 2021 to 2025, 39 units were overhauled, an average of approximately eight units per year. Hydro is planning to manage overhaul or replacement of parts under this program going forward and will report trending in the same manner.

4.1 Assets Installed/Replaced/Upgraded

Chart 2 provides the five-year historical, current, and five-year forecast numbers of diesel units renewed per year.

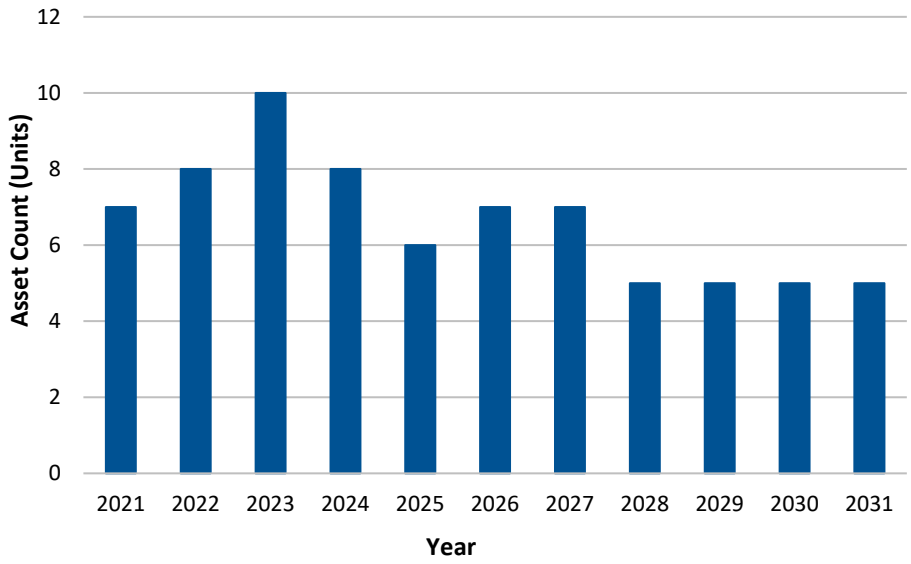


Chart 2: Historical and Forecast Number of Assets Overhauled

4.2 Historical and Forecast Average Unit Costs

Overhaul costs vary significantly based on unit engine ratings. The ratings of genset units under this program vary from 40 kW to 2,500 kW. Variability in annual budgets for this program can be attributed to the rating and number of units addressed in each year.

Chart 3 provides the five-year historical, current, and five-year forecast average unit cost of intervention.

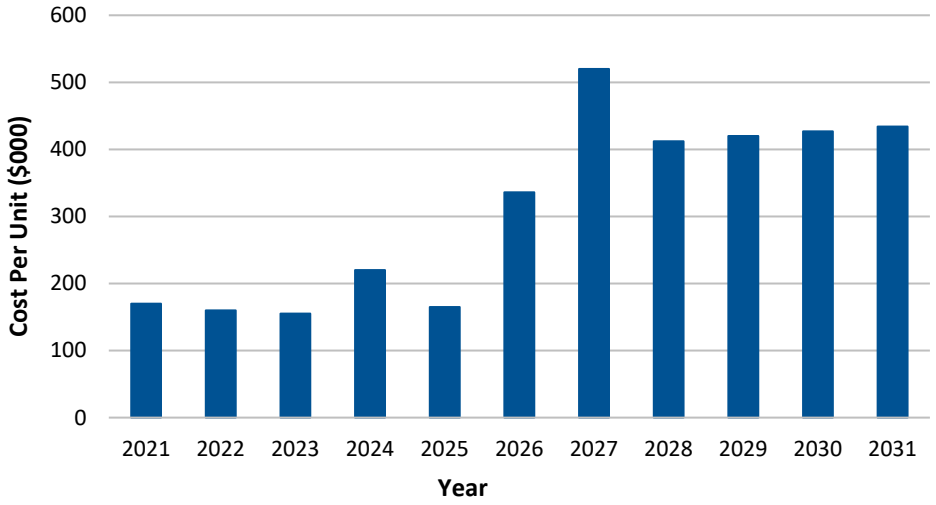


Chart 3: Historical and Forecast Average Unit Costs of Assets Overhauled

4.3 Historical Reliability

Hydro's overhaul program is configured to ensure a balance of reliability and cost-effectiveness while taking into account the OEM's recommendations for overhaul intervals. Performing intervention at this interval is critical to maintaining reliability in isolated communities, which often rely on Hydro's diesel generating stations as their sole source of power. Failure to perform a required renewal could have negative consequences and may lead to equipment failure in communities with limited accessibility to other sources of power. If Hydro does not perform work as per OEM recommendations as proposed under this program, diesel units may experience catastrophic failure prior to their operating hour lifespan.

Hydro tracks the reliability of diesel communities, similar to its other locations, using SAIDI[6] and SAIFI;[7] however, it is tracked at a system level, not by individual generating units. These statistics do not distinguish between the different outage causes, such as line outages, recloser issues, blown fuses, fuel system problems, or generator issues.

5.0 Analysis

5.1 Evaluation of Alternatives

Hydro evaluated the following alternatives:

- Pace reduction;
- Continue program at current pace; and
- Alternative strategies.

5.1.1 Pace Reduction

Based on OEM recommendations, the condition of the units during intervention, and unit reliability, Hydro has determined that the currently recommended number of operating hours reached by each unit prior to renewal is appropriate. As extending the timing of these renewal activities would present an unacceptable risk to reliability, pace reduction is not considered to be a viable alternative.

[6] System Average Interruption Duration Index ("SAIDI").
[7] System Average Interruption Frequency Index ("SAIFI").

5.1.2 Continuation of Program at Current Pace

Hydro has maintained intervention at 20,000 operating hours for 1,800 rpm engines and 30,000 operating hours for 1,200 rpm engines, based on the reliable performance and the condition of parts observed during previous overhauls. The renewal of diesel units based on Hydro's existing criteria is consistent with OEM recommendations and Hydro's experience with diesel units and is necessary to proactively maintain the assets to ensure safe and reliable service.

5.1.3 Alternative Strategies

Hydro has not identified any alternative strategies that would support the safe and reliable operation of its diesel generating units.[8]

5.2 Least-Cost Evaluation

Hydro has undertaken a review of upfront capital costs for overhaul versus replacement of these assets based on trends experienced in recent execution of this program. From 2024–2026,[9] the average cost for a unit overhaul is approximately $263,000, while the average cost for replacement is approximately $296,000. While this is not a significant difference, replacement versus overhaul brings intangible benefits such as improved reliability, warranties, and generally limits outage time more than sending the unit offsite for overhaul. Given this system betterment, Hydro believes replacement to be the least-cost solution in most cases, but will continue to evaluate on a case-by-case basis where required.

5.3 Recommended Alternative

Hydro recommends the continuation of the program at the current pace in order to maintain the reliable operation of its diesel generating facilities.

5.3.1 Risk of Asset Stranding

Hydro's diesel generating stations are often isolated and, in most cases, are the sole source of power to communities. As such, the risk of asset stranding is low.

[8] Hydro has determined the pace of this program based on operating hours; however, Hydro does consider advancing diesel unit renewal when dictated by unit condition. Based on the current condition of Hydro's diesel unit fleet, pace advancement was not required within the 2027 program.
[9] The 2026 analysis was based on forecast values.

5.3.2 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027 program in accordance with Hydro's Capital Risk Assessment process, as outlined in Section 7.0 of Schedule 1. The outcome of this assessment is provided in Table 2.

Table 2: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	4	4	**16**
Post-Implementation	4	2	**8**
		Risk Mitigated	**8**
		Risk Mitigated per $1 Million	**2.2**

6.0 Scope of Work

The Renew Diesel Units Program for 2027 includes the planned renewal of seven diesel units. Unit hours can change based on system and loading conditions, and on occasion, a unit in one of the diesel generating stations across Hydro's operating area will experience an issue that necessitates an unplanned intervention or will reach the recommended number of operating hours for renewal earlier than anticipated. Where appropriate, Hydro may complete such work under this program and, if possible, defer the overhaul of one of the planned units.

The units currently proposed under this program in 2027 are:

- Hopedale Diesel Unit 2054;
- St. Lewis Diesel Unit 2080;
- Cartwright Diesel Unit 2086;
- Postville Diesel Unit 2096;
- Cartwright Diesel Unit 594;
- Francois Diesel Unit 588; and
- McCallum Diesel Unit 2064.

6.1 Program Budget

The estimate for this program is shown in Table 3.

Table 3: Program Estimate ($000)[10]

Program Cost	2027	2028	Beyond	Total
Material Supply	2,311.0	0.0	0.0	2,311.0
Labour	526.4	0.0	0.0	526.4
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	141.4	0.0	0.0	141.4
Interest and Escalation	134.1	0.0	0.0	134.1
Contingency	529.0	0.0	0.0	529.0
Total	**3,642.0**	**0.0**	**0.0**	**3,642.0**

Genset units range in size from 40 kW to 2,500 kW. Costs vary significantly based on engine ratings and usage; as such, the number and size of units addressed in a year creates budget variability. Chart 4 provides the five-year historical program expenditures, the forecast 2026 expenditures, the proposed 2027 program budget, and the forecast budget through 2031.

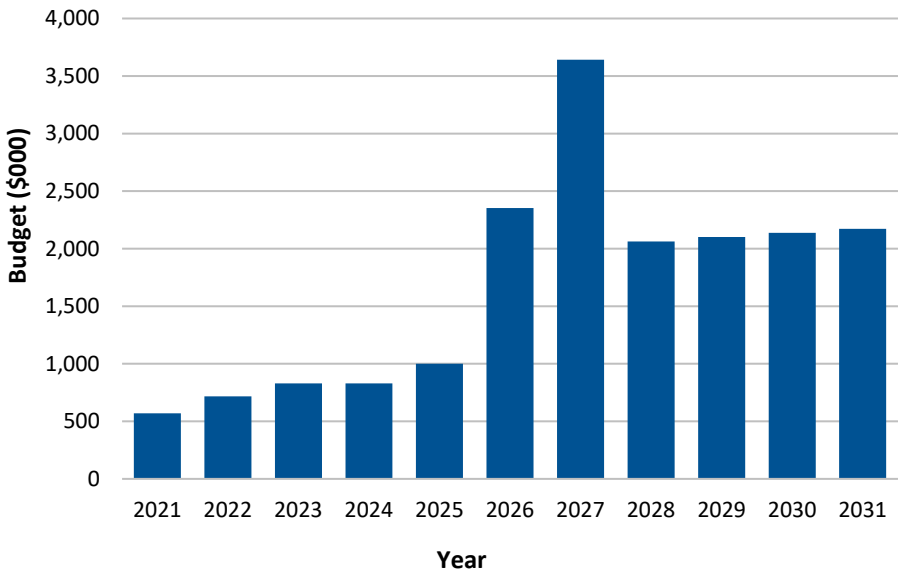


Chart 4: Historical and Forecast Program Budget

[10] Numbers may not add due to rounding.

Forecast budgets and average costs per unit are anticipated to increase significantly in 2027 and beyond due to price increases related to tariffs, higher exchange rates for materials, and increased contingency to help mitigate uncertainty surrounding these unknowns. The proposed budget for 2027 is higher due to the refurbishment of two 1,200 rpm units, which are more expensive than 1,800 rpm units.

6.2 Program Schedule

The schedule for this program is shown in Table 4.

Table 4: Program Schedule

Activity	Start Date	End Date
Planning:		
Schedule annual renewal.	January 2027	September 2027
Procurement:		
Purchase components.	February 2027	October 2027
Construction:		
Complete renewals.	April 2027	November 2027
Commissioning:		
Testing.	April 2027	November 2027
Closeout:		
Release for service and asset assignment.	December 2027	December 2027

7.0 Conclusion

To support the continued safe and reliable operation of Hydro's diesel units, Hydro is proposing the renewal of seven diesel units in 2027. Units are scheduled for intervention based on the number of hours used, in comparison to their rpm rates. This work is critical to maximizing the life expectancy of units to limit larger replacement costs. Based on recent execution trends, Hydro has determined that shifting from an overhaul to a renewal-based approach provides material tangible and intangible benefits to customers.

Replace Heavy-Duty Vehicles

(2027–2029)

newfoundland labrador hydro

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Replace Heavy-Duty Vehicles (2027–2029)

Location: Various

Investment Classification: General Plant

Asset Category: Transportation

Estimated Cost: $3,447,900

1.0 Introduction

Newfoundland and Labrador Hydro ("Hydro") operates a fleet of heavy-duty vehicles distributed throughout its operating areas across the province, which is comprised of 71 heavy-duty assets.[1] These assets include heavy-duty, single-axle, and tandem-axle trucks with various specialized equipment[2] mounted on them, used for line construction and maintenance. The fleet is utilized daily to support staff engaged in the operation and maintenance of the electrical system.

Under this program, Hydro is proposing the replacement of five heavy-duty vehicles in accordance with its replacement criteria.

2.0 Program Description and Justification

Hydro operates its fleet of heavy-duty vehicles as required to maintain the safety and reliability of the electrical system. Hydro's key replacement criteria for heavy-duty vehicles are provided in Table 1. In addition to age and odometer readings, asset condition and the criticality of the unit to Hydro's operations are also considered in determining whether a vehicle should be replaced in a given year.

Table 1: Replacement Criteria

Vehicle	Replacement Criteria
Heavy-Duty – Class 4 and 6	9 years or 200,000 kilometres (odometer reading), dependent on condition/maintenance cost and reliability.

Based on this criteria, five heavy-duty vehicles meet the threshold for replacement. A reliable fleet of heavy-duty vehicles is critically important for the provision of safe, reliable power. Without addressing

[1] Two vehicles are are currently on loan from suppliers due to lead times of equipment.
[2] Specialized equipment includes light-duty aerial devices, single- and tandem-axle material handlers, and single- and tandem-axle radial boom derricks.

the need for replacement, existing vehicles will continue to age and accumulate excess mileage, resulting in increased downtime and decreased reliability.

Historically, the replacement of heavy-duty vehicles was part of a larger program scope that also included light-duty vehicles, such as fleet transportation. In Board of Commissioners of Public Utilities ("Board") Order No. P.U. 28(2024), the Board noted concerns with including scopes of light- and heavy-duty vehicles in the same program, stating:

> The Board finds that Hydro has not provided sufficient justification for the combining of light- and heavy-duty vehicles/assets. While there may be some efficiencies gained in grouping the different types of vehicles/assets together, the Board finds that separation will allow for greater transparency, clarity, and better reflect delivery time and cost.[3]

Upon further review of the program scopes and consideration of the Board's findings, Hydro separated light- and heavy-duty vehicles into separate programs in its 2026 Capital Budget Application. In addition, as described further in Section 6.1, the amounts for cost escalation and contingency included within the budget for this program have been increased to reflect current market conditions.

3.0 Asset Overview

3.1 Asset Background

Entering 2027, Hydro's heavy-duty fleet is forecast to include 71 heavy-duty, single-axle and tandem-axle trucks which are mounted with specialized equipment used for line construction and maintenance.

On average, Hydro's vehicles accumulate 20,000–25,000 kilometres per year, or an average of 180,000–225,000 kilometres over the nine-year life of the vehicle. On occasion, some vehicles accumulate higher than average mileage, while other vehicles accumulate lower than average mileage which serves to extend the service life of the vehicle.

In Hydro's experience, its vehicle replacement criteria is appropriate and results in the least-cost replacement of its heavy-duty fleet. Hydro also monitors vehicle replacement practices of other Canadian utilities, as well as statistics on Hydro's own vehicle usage rates, to ensure Hydro's criteria and vehicle replacement rates appropriately reflect Hydro's operational needs.

[3] Board Order No. P.U. 28(2024), p. 7/19–22.

3.2 Asset Condition

As equipment ages, failures are more likely to occur. In addition, heavy-duty vehicles often experience accelerated wear and tear due to their operation in rough terrain, as well as premature corrosion from exposure to salt spray. These factors result in an increase in the amount of downtime required for repair. Increased downtime in Hydro's fleet can negatively impact response times to customer outages as well as Hydro's ability to undertake planned maintenance activities.

Heavy-duty vehicles are inspected in accordance with the manufacturer's preventive maintenance schedule, and all maintenance and repairs are performed either in-house or by third-party service providers, as needed. This helps to ensure that the maximum potential reliable service life is achieved.

If an asset has reached one of the replacement criteria shown in Table 1, the asset will be assessed to determine whether the service life of the asset can be safely and reliably extended and remain part of the fleet.

3.3 Condition-Based Remaining Life

Vehicles that have reached one or more replacement criteria, but have been determined to be suitable for a service life extension, are assessed by Hydro to determine the most appropriate assignment for the asset. For example, the asset may be reassigned to an area where less mileage is expected to occur, or where the operating conditions for the vehicle are less severe.

3.4 Asset Ages

Chart 1 provides the heavy-duty vehicle asset age of the fleet, including those proposed for replacement. For heavy-duty vehicles, the average age of the fleet in 2027 is approximately eight years. Supply chain constraints and production delays in recent years have limited Hydro's ability to procure the heavy-duty vehicles required for its operations. This has resulted in an increase in the number of assets which have remained in service beyond their expected service life. The experience has validated that excessive failures and operational impacts do result, and the replacement criteria are sound.

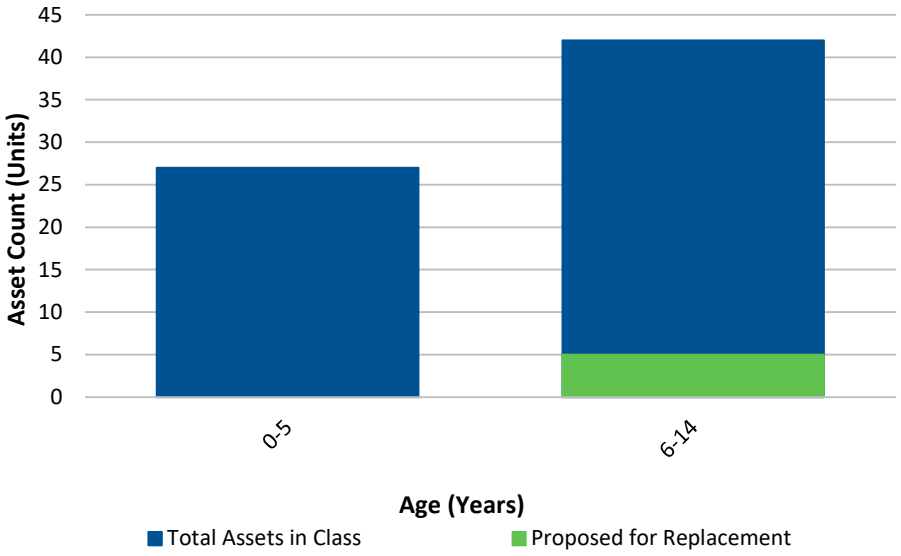


Chart 1: Asset Counts by Asset Age[4]

4.0 Trending

4.1 Assets Installed/Replaced/Upgraded

Chart 2 provides the five-year historical, current, and five-year forecast number of heavy-duty vehicles replaced under this program. The number of assets in service from 2020 to 2024 is below average due to global supply chain challenges. The number of deliveries in 2025 to 2026 are higher than average, primarily due to to vehicles ordered in 2025 not being delivered until 2026 as a result of order timing. The forecast for the number of assets to be installed, replaced or upgraded in future years is based on the outcome of Hydro's review of the average age versus service life as discussed in Section 6.1, Chart 4.[5]

[4] Excludes loaner vehicles.
[5] The forecast projections consider current fleet size requirements, with some variances observed due to uneven age distributions and varying delivery times within the fleet.

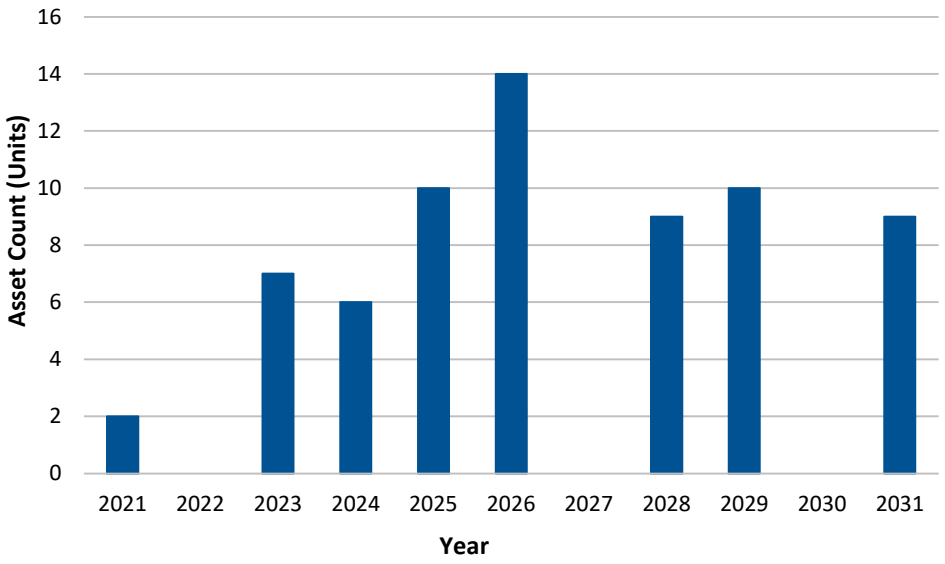


Chart 2: Historical and Forecast Number of Assets Installed/Replaced/Upgraded

4.2 Historical and Forecast Average Unit Costs

Chart 3 indicates the average historical and forecast replacement unit cost for Hydro's heavy-duty vehicles. The average unit cost of heavy-duty vehicles varies from year to year, and this variation is largely attributed to cost increases in this segment since 2020, economic factors such tariffs, as well as the specific types of heavy-duty vehicles procured in a given year.

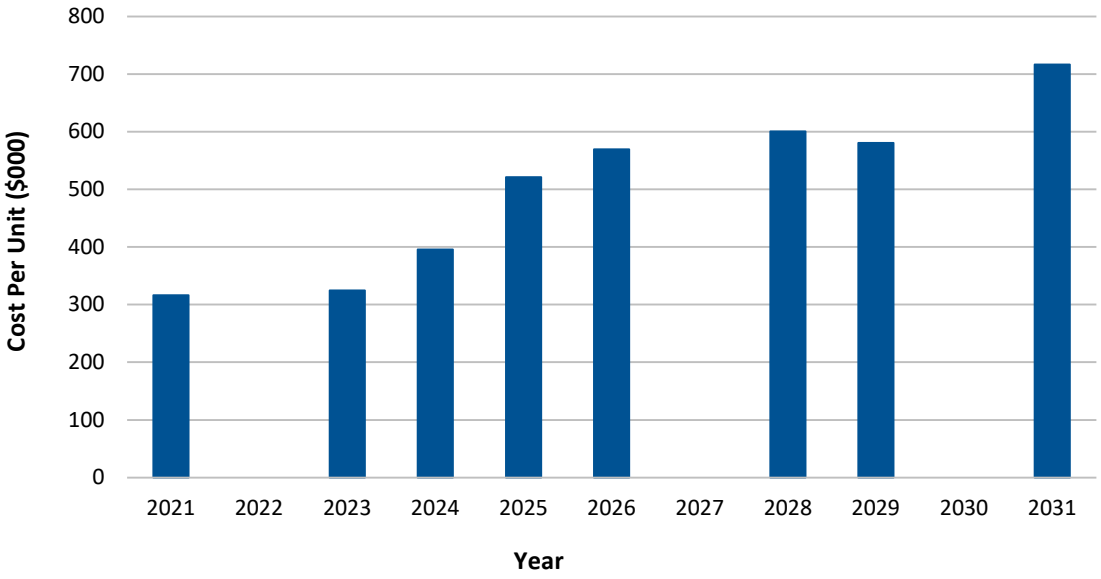


Chart 3: Historical and Forecast Average Unit Costs of Assets Installed/Replaced/Upgraded

4.3 Historical Reliability

Heavy-duty vehicles are inspected in accordance with the preventive maintenance schedule. All maintenance and repairs are performed either in-house or by third-party service providers, as needed.

5.0 Analysis

5.1 Evaluation of Alternatives

Hydro considered the following alternatives:

- Pace reduction;
- Pace advancement;
- Continue program at current pace; and
- Alternative strategies – vehicle rentals.

5.1.1 Pace Reduction

In 2020, Hydro re-evaluated its replacement criteria and reduced the pace of replacement based on a review of industry standards and the condition of the units upon replacement. Based on Hydro's experience, reducing the pace of replacements presents reliability risks. This is confirmed by the unplanned reduction in vehicle replacements caused by supply chain constraints since 2020. The reduced replacement rate resulted in an increased rate of vehicle failure which has challeneged Hydro's ability to complete required work. For this reason, pace reduction is not considered a viable option.

5.1.2 Pace Advancement

Advancing the pace of this program may result in the premature retirement of existing, functional assets, requiring a level of investment which is in excess of the delivery of safe, reliable, least-cost power, in an environmentally responsible manner. For this reason, pace advancement is not considered a viable option.

5.1.3 Continuation of Program at Current Pace

Hydro has determined that the current replacement criteria are appropriate based on consultation with other utilities, the condition of the units upon replacement, and vehicle usage statistics. This approach allows Hydro to balance cost with the reliability of Hydro's vehicle fleet. These vehicles are required to

facilitate maintenance and timely response to system events, and as such, are required to be available and in appropriate working condition.

5.1.4 Alternative Strategies - Vehicle Rentals

Hydro has considered supplementing its heavy-duty fleet vehicle needs with rental vehicles; however, heavy-duty rental vehicles are not readily available. Additionally, much of Hydro's heavy-duty fleet is customized for specific industrial work. As such, there is no direct replacement option available in the rental market that can perform consistently with Hydro's fleet. For these reasons, Hydro does not consider this a viable option.

5.2 Least-Cost Evaluation

Hydro has not identified any viable alternatives to facilitate a least-cost evaluation.

5.3 Recommended Alternative

Hydro's recommended alternative is to proceed with the identified replacements based on its replacement criteria.

5.3.1 Risk of Asset Stranding

This program is necessary to maintain a safe and reliable fleet. Failure to replace this equipment will lead to increased maintenance costs, less reliable equipment, delays in scheduled and unscheduled work, and potential safety issues for operators. Hydro does not foresee any changes in its requirements for heavy-duty vehicles; therefore, the risk of asset stranding is low.

5.3.2 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027–2029 program in accordance with Hydro's Capital Risk Assessment process as outlined in Section 7.0 of Schedule 1. The outcome of this assessment is provided in Table 2.

Table 2: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	3	4	**12**
Post-Implementation	3	1	**3**
		Risk Mitigated	**9**
		Risk Mitigated per $1 Million	**2.6**

6.0 Scope of Work

This program proposes the replacement of five heavy-duty vehicles in accordance with Hydro's replacement criteria. This scope includes the procurement of vehicles and accessorizing as required, based on the purpose of the vehicle.[6] This program also includes $100,000 to address in-service failures for fleet vehicles. Hydro will evaluate the cost of repair or refurbishment versus replacement prior to executing in-service failure repairs.

6.1 Program Budget

The estimate for this program is shown in Table 3.

Table 3: Program Estimate ($000)[7]

Program Cost	2027	2028	Beyond	Total
Material Supply	650.0	1,000.0	1,000.0	**2,650.0**
Labour	21.5	28.2	19.0	**68.6**
Consultant	0.0	0.0	0.0	**0.0**
Contract Work	0.0	0.0	0.0	**0.0**
Other Direct Costs	6.8	13.5	2.3	**22.5**
Interest and Escalation	24.4	57.4	85.9	**167.7**
Contingency	132.8	204.2	202.1	**539.1**
Total	**835.4**	**1,303.3**	**1,309.2**	**3,447.9**

Recent implementation and adjustments of tariffs on vehicles, as well as the prices of components and materials used to fabricate vehicles, have increased uncertainty and volatility in the unit price of these assets. To mitigate these uncertainties, Hydro has increased the amount of contingency included within this proposal to approximately 20%. The contingency budget for the purchase of vehicles includes approximately 10% to accommodate potential price increases relating to various market factors. As price effects relating to tariffs become more apparent, and in cases where tariffs are adjusted in the future, Hydro will reevaluate the amount of contingency included in future vehicle replacement budgets.

[6] Where appropriate, Hydro will consider electric vehicles during the procurement process. Vehicles will be selected based on their suitability for their intended purpose, as well as lifecycle cost.
[7] Numbers may not add due to rounding.

Heavy-duty vehicles will be requisitioned in 2027, with delivery expected in 2028 and 2029. Heavy-duty vehicles are replaced based on age, accumulated kilometres, and condition; as such, the types of vehicles replaced will vary from year to year. Chart 4 provides the five-year historical program expenditures, the forecast 2026 expenditures, the proposed 2027–2029 program budget, and the forecast budget through 2031.

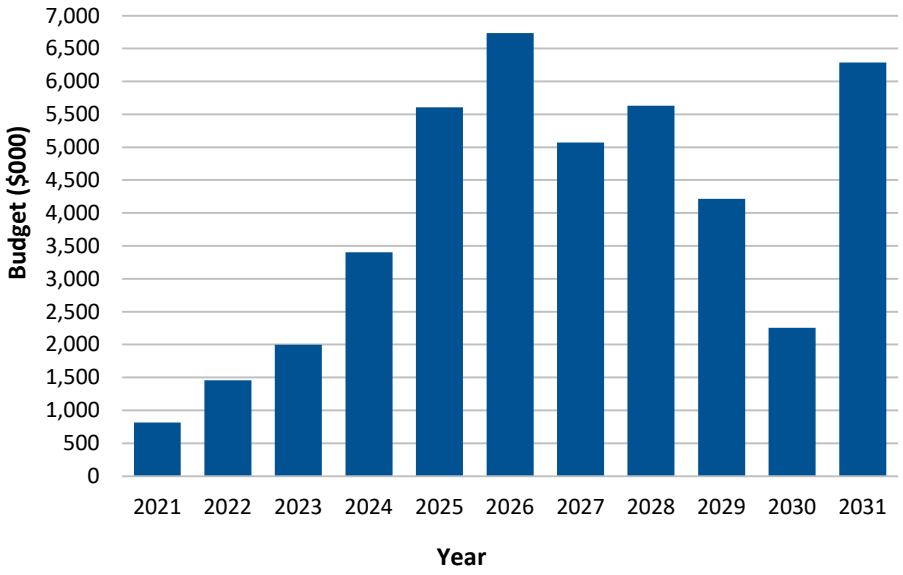


Chart 4: Historical and Forecast Program Budget

6.2 Program Schedule

The schedule for this program is shown in Table 4.

Table 4: Program Schedule

Activity	Start Date	End Date
Planning: Open work orders, plan, and develop detailed schedules.	February 2027	February 2027
Procurement: Tender and award contracts to purchase heavy-duty vehicles.	February 2027	May 2027
Commissioning: Receive and commission heavy-duty vehicles.	May 2027	September 2029
Closeout: Close work orders, complete all documentation, and complete lessons learned.	November 2029	December 2029

7.0 Conclusion

Hydro operates a fleet of heavy-duty vehicles to enable effective maintenance of the electrical system and timely response to system events. Failure to replace the heavy-duty equipment will lead to increased maintenance costs, less reliable equipment, and safety concerns for all users.

The established replacement guidelines have been determined to be appropriate. Hydro proposes to continue with the replacement of vehicles under this program for 2027.

Hydraulic In-Service Failures

(2027)

newfoundland labrador hydro



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Hydraulic In-Service Failures (2027)

Location: Various

Investment Classification: Renewal

Asset Category: Hydraulic Plant

Estimated Cost: $3,353,500

1.0 Introduction

Newfoundland and Labrador Hydro ("Hydro") conducts asset management activities to proactively identify, replace, repair, or refurbish equipment to minimize the disruption of service and to avoid unsafe working conditions due to equipment failure. An objective of Hydro's Asset Management Program is to identify refurbishment and replacement activities that require approval by the Board of Commissioners of Public Utilities ("Board") in time to be included in Hydro's annual capital budget application ("CBA"). This is achieved through the Preventive Maintenance Program using various condition-based assessments and testing procedures.

Hydro has had success in projecting the deterioration rate of equipment for submission of refurbishment or replacement work into CBAs. However, there are situations where immediate refurbishment or replacement must be completed due to the occurrence of an actual failure, the identification of an incipient failure, or the determination of faster-than-anticipated equipment deterioration. These situations can be caused by events such as vandalism, storm damage, lightning, accidental damage, abnormal system operations, cavitation, corrosion, and wear of mechanical components. Hydro uses historical data and engineering judgment to predict the magnitude of these in-service failure expenditures.

2.0 Program Description and Justification

Due to the nature of hydraulic equipment and infrastructure, unanticipated failures and deterioration will occur. Under the Hydraulic In-Service Failures Program, Hydro is proposing to undertake the immediate capital refurbishment and replacement work required to maintain the safe and reliable operation of its hydraulic generating assets, and to ensure the availability of capital spares required to support such work. Deferral of work that is justified under this program could result in a detrimental impact on customer power supply or an unacceptable risk to workers or public safety. Required work

will be evaluated to determine the appropriate form of execution as an in-service failure, an Allowance for Unforeseen Item, or a supplemental project.

At this time, Hydro's capital spare acquisitions for 2027 include:

- Units 1 to 6 Spare Excitation Transformer[1] - Bay d'Espoir; and
- Units 5 and 6 Spare Stator Bars[2] - Bay d'Espoir.

Throughout 2027, Hydro may purchase additional capital spares identified by asset management personnel as requiring immediate procurement to offset deficiencies in its capital spares inventory, and to account for increasing lead times for equipment.

3.0 Asset Overview

3.1 Asset Background

The assets requiring immediate, unplanned replacement or refurbishment work in a given year cannot be identified in advance. The assets covered within the Hydraulic In-Service Failures Program are generally included in the following broad asset classes:

- Hydraulic generating units;
- Hydraulic structures;
- Reservoirs; and
- Auxiliary equipment.

For further information on the work executed under the Hydraulic In-Service Failures (2025) Program that individually exceeded $750,000, please refer to Hydro's "Capital Expenditures and Carryover Report for the Year Ended December 31, 2025."[3]

[1] There is currently no spare Excitation Transformer; an old previously used transformer was kept on-site for emergency. This purchase is for a spare direct replacement, to be utilized if required.
[2] During the planned annual inspection of Bay d'Espoir Unit 6 in May 2024, it was discovered that damage had occurred to the stator winding. This damage was repaired under Hydro's 2024 Hydraulic In-Service Failure program using existing capital spare bars. These purchases will replenish the capital spare stock for Units 5 and 6.
[3] Provided as Appendix B to Schedule 5 of this application.

3.2 Asset Condition

Assets replaced or refurbished under this program have experienced unplanned failure or exhibit signs of incipient failure; therefore, these assets have reached the end of their serviceable life.

3.3 Asset Ages

The age of assets potentially covered under this program varies. Unplanned replacement or refurbishment activities due to failure may be necessary at any time during the asset life cycle.

4.0 Trending

Hydro implemented the Hydraulic In-Service Failures Program in 2018. Over the past five years, on average, Hydro has executed 15 unplanned projects per year under the program.

4.1 Assets Installed/Replaced/Upgraded

The number of unplanned In-Service Failures projects initiated under the program over the past five years is provided in Chart 1. Hydro anticipates that unplanned failures will continue to occur, given the age and number of hydraulic assets covered under the program.

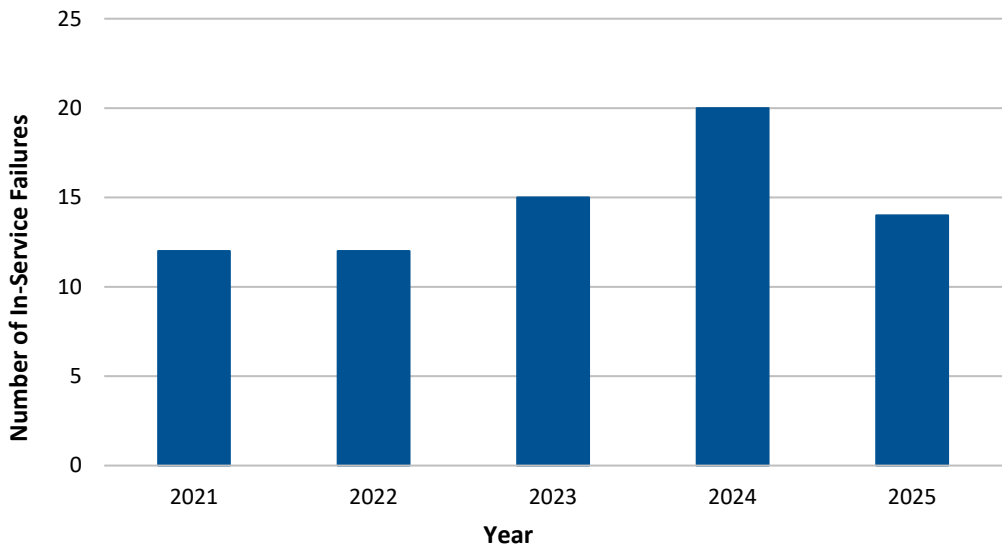


Chart 1: In-Service Failure Frequency

4.2 Historical and Forecast Average Unit Costs

Historical and forecast program costs are provided in Chart 2 in Section 6.1. Due to the nature of this program and the range of assets covered, average unit cost information is not applicable.

4.3 Historical Reliability

Hydro tracks performance data for its hydraulic units using the Derated Adjusted Forced Outage Rate ("DAFOR").[4,5] This program plays a key role in allowing Hydro to minimize the DAFOR of its hydraulic units to ensure the provision of reliable service to customers. As this program addresses a wide range of asset types, the specific assets to be addressed within this program for 2027 are not known. As such, historical reliability data for the individual assets covered within this program is not applicable.

5.0 Analysis

5.1 Evaluation of Alternatives

Depending on the nature of each failure or incipient failure, Hydro reviews viable technical alternatives to determine the most appropriate solution to address the unplanned event while balancing urgent safety and operational risks.

Due to the urgent nature of work executed under this program, seeking approval through a supplemental capital expenditures application or deferring the work for inclusion in the next capital budget application are not viable alternatives. The alternative of executing required unplanned work under the Allowance for Unforeseen Items Account is also considered on a case-by-case basis, subject to the requirements set out by the Board for use of the account.

5.2 Risk of Asset Stranding

Assets replaced or refurbished under this program have an inherently low risk of asset stranding. The assets covered under this program are critical to Hydro's ability to meet customer requirements. The risk of asset stranding would be considered on a case-by-case basis, if applicable.

[4] DAFOR is a metric that measures the percentage of time that a unit or group of units is unable to generate at its maximum continuous rating due to forced outages or unit deratings.
[5] "Quarterly Report on Asset Performance in Support of Resource Adequacy for the Twelve Months Ended March 31, 2026," Newfoundland and Labrador Hydro, May 4, 2026.

5.3 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027 program in accordance with Hydro's Capital Risk Assessment process, as outlined in Section 7.0 of Schedule 1.0. The outcome of this assessment is provided in Table 1.

Table 1: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	3	5	**15**
Post-Implementation	3	1	**3**
		Risk Mitigated	**12**
		Risk Mitigated per $1 Million	**3.6**

6.0 Scope of Work

6.1 Program Budget

The estimate for this program is shown in Table 2. The estimate is based on the average expenditures from 2023 to 2025, and the purchase of two capital spares identified for 2027.[6] Expenditures associated with the refurbishment of the Penstock 1 rupture in Bay d'Espoir and the Cat Arm Unit 1 Runner Replacement were not included in the average calculation. These costs were omitted, as they were considered outliers due to the unlikelihood of these failures to reoccur. Hydro will re-evaluate the inclusion of both costs in future program budgets should similar failures or replacements continue to occur.

The details of each scope covered under this program that individually exceeded $750,000, including the associated assets and costs, as well as the total program expenditures for each year, are filed with the Board within Hydro's annual Capital Expenditures and Carryover Report.[7] Work executed under the 2027 program that individually exceed $750,000 will be reported to the Board in Hydro's 2027 Capital Expenditures and Carryover Report.[8]

[6] The capital spares are estimated at a cost of $1,059,000, not including engineering labour.
[7] Hydro's most recent Capital Expenditure and Carryover Report was filed with the Board on April 1, 2026.
[8] Hydro's 2027 Capital Expenditures and Carryover Report is to be filed on or before April 1, 2028.

Table 2: Program Estimate ($000)

Program Cost	2027	2028	Beyond	Total
Material Supply	969.5	0.0	0.0	**969.5**
Labour	552.8	0.0	0.0	**552.8**
Consultant	130.0	0.0	0.0	**130.0**
Contract Work	1,395.0	0.0	0.0	**1,395.0**
Other Direct Costs	27.9	0.0	0.0	**27.9**
Interest and Escalation	108.3	0.0	0.0	**108.3**
Contingency	170.0	0.0	0.0	**170.0**
Total	**3,353.5**	**0.0**	**0.0**	**3,353.5**

Chart 2 provides the five-year historical program expenditures, the forecast 2026 expenditures, the proposed 2027 program budget, and the forecast budget through 2031. Since Hydro is unable to predict the quantity and nature of failures that will need to be addressed within this program in future years, the forecasted expenditures for this program are based on the 2027 program budget with cost escalation applied.

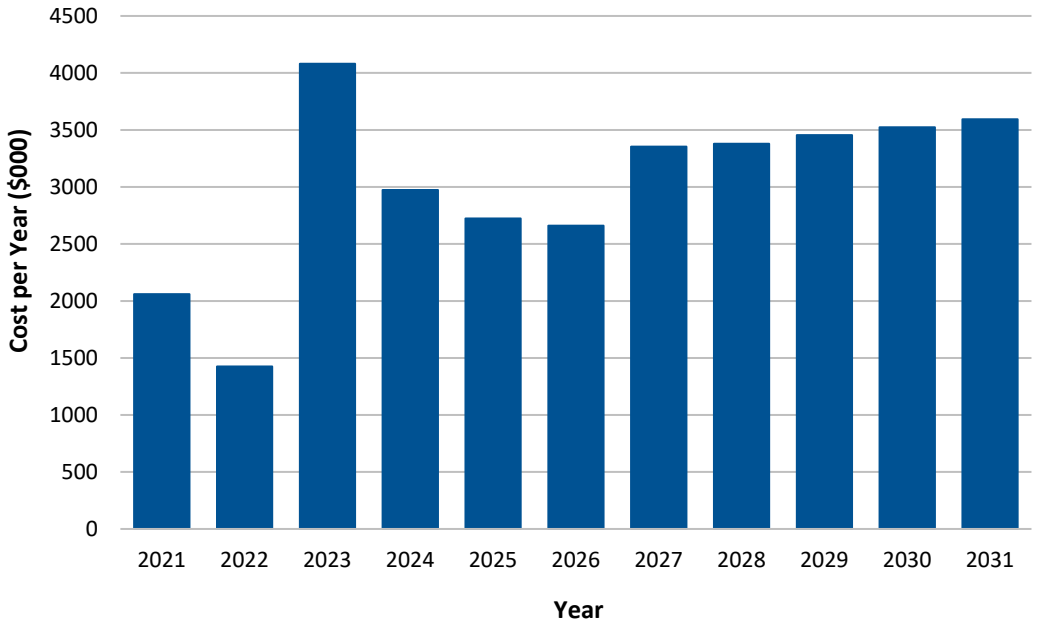


Chart 2: Historical and Forecast Program Budget[9]

[9] The significant program costs shown in 2023 and 2025 are associated with the aforementioned unplanned projects executed for the refurbishment of the Penstock 1 rupture in Bay d'Espoir ($1,450,000) and the Cat Arm Unit 1 Runner Replacement ($1,818,300).

6.2 Program Schedule

Work schedules are established subsequent to an unplanned failure or incipient failure event. All capital spares acquisitions are anticipated to be on site before the end of 2027.

7.0 Conclusion

The Hydraulic In-Service Failures Program allows Hydro to undertake timely refurbishment and replacement work that is not included in its Preventive Maintenance Program, supporting Hydro's effort to maintain safe and reliable operations, in an environmentally responsible manner. This program will also allow Hydro to continue to proactively manage the pool of capital spare equipment to maintain the integrity and reliability of the electrical system.

Replace Protective Relays

(2027–2028)

newfoundland labrador hydro

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Appendix A: Five-Year Plan

Replace Protective Relays (2027–2028)

Location: Various

Investment Classification: Renewal

Asset Category: Terminal Stations

Estimated Cost: $3,014,300

1.0 Introduction

Protective relaying is a vital component of an electrical system, particularly during trouble, faults, and abnormal operating conditions. Protective relays are found in all of Newfoundland and Labrador Hydro's ("Hydro") terminal stations and generating stations. Protective relays function to protect major electrical equipment such as transmission and distribution lines, transformers, buses, circuit breakers, and generators. Properly applied and functioning protective relaying initiates the disconnection or clearing of faults to protect equipment while the operation and service of the rest of the system continue. Protective relaying should not take action under normal operating conditions.

Within Hydro's system, existing protective relays are either electromechanical, solid state (digital) or microprocessor-based, and are scheduled for replacement based on criteria outlined in the Terminal Station Asset Management Strategy[1] which details Hydro's approach to protection, control, and modernization of asset management.

2.0 Program Description and Justification

The replacement of protective relays is driven by condition, and/or obsolescence. Hydro replaces electromechanical and solid-state relays with modern digital relays, improving reliability and, in some cases, providing additional functionality.

This program was initiated in 2016, with a plan to replace all existing electromechanical protective relays for transformers, buses, and line protection relays with modern digital relays. The 230 kV relays are the priority for the first phase of the plan, with 138 kV and 69 kV to follow. Installation of redundant transformer protection relays was also included in the program, in line with Hydro's Transformer

[1] Provided as Appendix F to Schedule 1 of this application.

Protection Standard. Generator protection relays were added to the program in recognition of the vital role they play in system reliability.

This program is required to ensure the reliable operation of protective relaying. Aging or non-standard protective relays can fail or inadequately protect the system during faults or abnormal operating conditions. This would prevent the timely isolation of the fault(s) or hazards, thus compromising power system reliability, stability, and overall equipment health. Hydro proposes to replace nine different protection systems located at terminal stations across the system.

3.0 Asset Overview

3.1 Asset Background

Protective relays continuously monitor for abnormal operating conditions in the electrical system. Hydro completes routine maintenance on a six-year cycle for protective relays and identifies any deficiencies for follow-up. The assets designated for upgrade herein have been selected by Hydro's Asset Management staff to align with Hydro's commitment to ensure the delivery of safe, reliable, least-cost electricity in an environmentally responsible manner.

The protective relays in this program are operational, and the justification for each replacement is obsolescence.

3.2 Asset Condition

Existing protective relays are either electromechanical, solid state (digital) or microprocessor-based. The oldest of these are electromechanical; wear and heating issues may cause them to fail or operate incorrectly. Digital or static relays have little to no moving parts; however, they do experience failure associated with aging internal components (e.g., power supplies, capacitors, LCDs[2]), most of which are unrepairable or obsolete.

A deficient relay may have two failure modes—it may not operate when needed to protect electrical equipment (which may result in widespread outages and/or equipment damage), or it may operate inadvertently (causing unplanned outages).

[2] Liquid-crystal display.

Each relay in Hydro's fleet is tested on a six-year preventive maintenance cycle. This program intends to replace aging and obsolete relays prior to finding them deficient during the six-year preventive maintenance test or upon failure.

3.3 Asset Ages

The age of assets covered under this program varies. Unplanned replacement or refurbishment activities due to failure may be necessary at any time during the asset lifecycle. All protective relays proposed for replacement in the scope of the Replace Protective Relays (2027–2028) Program are over 20 years old, with the majority over 60 years old. Chart 1 provides asset age for all assets covered under the program.

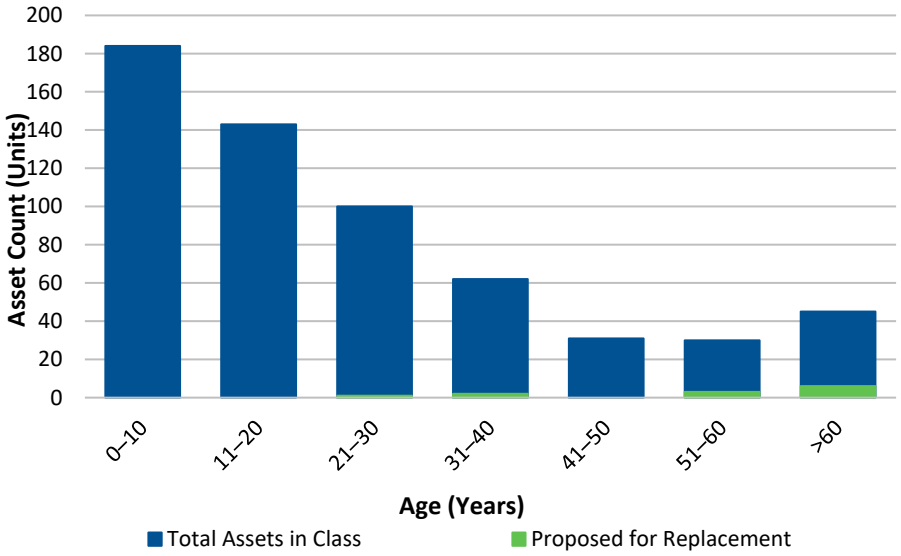


Chart 1: Asset Counts by Asset Age

4.0 Trending

Hydro's Asset Management staff maintains a list of in-service protective relays categorized by voltage class, equipment (i.e., type of protection—transmission line, feeder, transformer, bus, etc.), protection system (i.e., distance, overcurrent, differential, primary, secondary, backup, etc.), main relay model number (i.e., auxiliary relays are not tracked), and age. This is the basis for planning program replacements/upgrades.

4.1 Assets Installed/Replaced/Upgraded

Chart 2 provides the five-year historical, current, and five-year forecast number of protective relays installed, replaced, or upgraded per year. There were fewer installations completed in 2021, as Hydro concentrated on completing outstanding carryover. The number of installations in 2023 was planned to be lower, due to execution constraints; however, such a reduction in installations is not sustainable, and therefore the number of assets installed through 2031 will be more reflective of a typical execution year.[3] The number of installations in 2025 is higher than in other years as it includes a number of carry-over jobs from previous years.

In 2026, Hydro reduced the pace of the program to target installations consistent with its previous execution rate, after identifying the original pace of this program was unachievable due to resource and outage concerns.

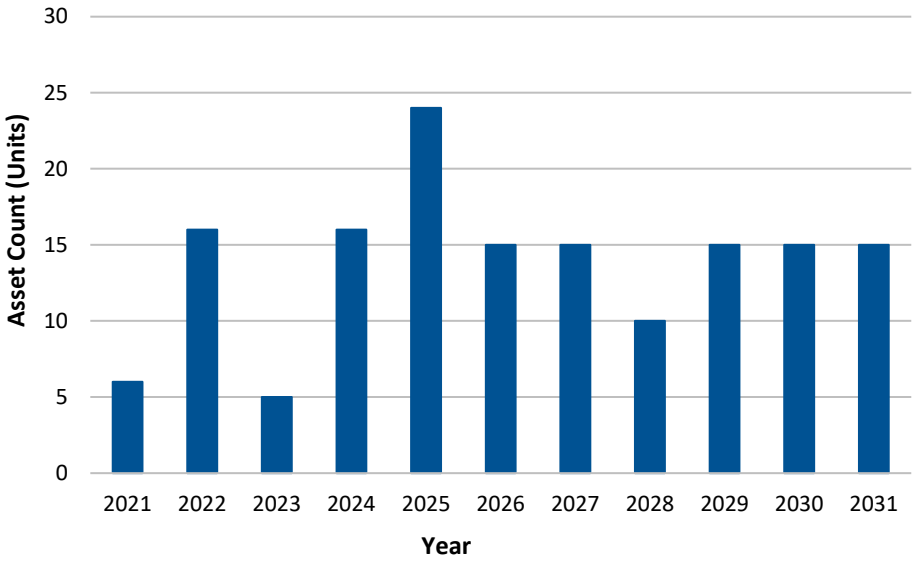


Chart 2: Historical and Forecast Number of Assets Installed/Replaced/Upgraded

4.2 Historical and Forecast Average Unit Costs

Chart 3 provides the five-year historical, current, and five-year forecast average unit cost of protective relay installations, replacements, or upgrades per year. Unit costs can vary due to the types of protections and execution approach. That is, line protections and generator protections are typically more complex than others and thus require more engineering and installation effort. For example, line

[3] Reduction in number of assets replaced in 2028 is driven by higher per unit cost.

protections make up approximately half of the protections planned for execution in 2026, and thus contribute to the higher unit cost in that year. The planned use of contractors and mobile substations for installations also results in increased costs, as is the case for 2028.

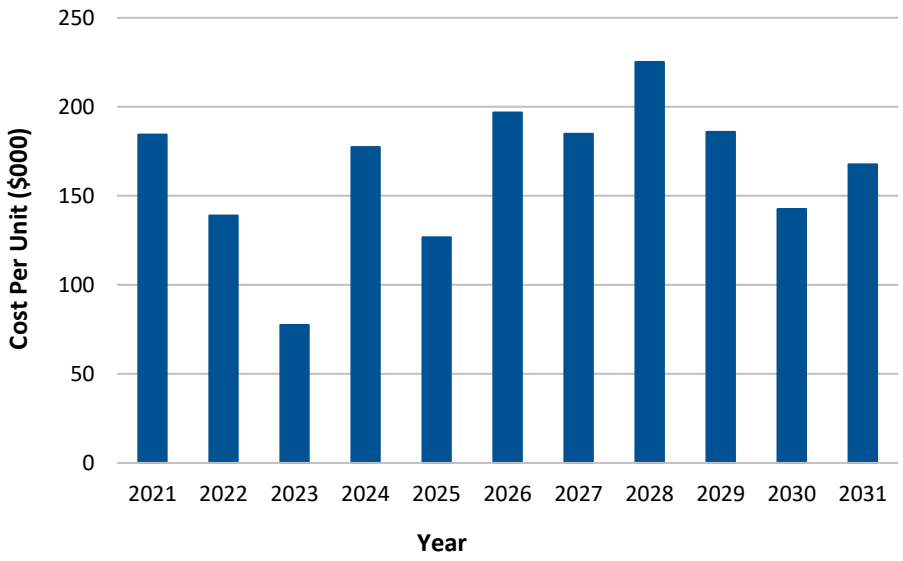


Chart 3: Historical and Forecast Average Unit Costs of Assets Installed/Replaced/Upgraded

4.3 Historical Reliability

Hydro does not record protective relay outage statistics; therefore, Hydro is unable to provide this data at this time.

5.0 Analysis

5.1 Evaluation of Alternatives

The following alternatives were considered:

- Pace reduction;
- Pace Advancement; and
- Continue Program at Current Pace.

5.1.1 Pace Reduction

In 2026, Hydro reduced the pace of installations to a number that better reflects its past execution rate. Further reducing the overall pace of replacement for the relays identified in the current program would

extend the in-service time of relays past Hydro's identified replacement criteria and increase the risk of in-service failures. This would present an increased risk to terminal station reliability and threaten the safe working environment. As such, pace reduction is not considered a viable alternative at this time.

5.1.2 Pace Advancement

Hydro has developed the replacement program considering system criticality, ability to execute, and resource and outage constraints. Advancing the protective relay replacements beyond the current rate may result in continued fluctuation in execution completion rates due to resource and outage constraints. As such, pace advancement is not a viable option.

5.1.3 Continuation of Program at Current Pace

Hydro plans to continue relay replacements at the current pace, consistent with its past execution rate. The protective relays proposed for replacement have been identified as obsolete. The protective relay replacements identified in a planned, strategic manner, as outlined in this proposal, are prudent. This approach enables Hydro to complete these upgrades to support its mandate to provide safe, reliable, least-cost service in an environmentally responsible manner.

5.2 Least-Cost Evaluation

Hydro has not identified any viable alternatives to facilitate a least-cost evaluation.

5.3 Recommended Alternative

Hydro recommends proceeding with the proposed protective relay replacements at the current pace.

5.3.1 Risk of Asset Stranding

For the assets included within the 2027–2028 program, there is no undue risk that these capital additions will be stranded before their useful life has been reached, as there are no plans to retire any of the associated terminal stations.

5.3.2 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027–2028 program in accordance with Hydro's Capital Risk Assessment process, as outlined in Section 7.0 of Schedule 1. The outcome of this assessment is provided in Table 1.

Table 1: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	3	3	**9**
Post-Implementation	3	1	**3**
		Risk Mitigated	**6**
		Risk Mitigated per $1 Million	**2.0**

6.0 Scope of Work

Hydro's five-year plan for the Replace Protective Relays Program is provided in Appendix A.[4] Based on current conditions and asset data, Hydro plans to replace nine different protection systems located within terminal stations under this program. All work is planned to be completed by the end of 2028. Based on asset condition, and outage and resource availability at the time of execution, Hydro may advance or defer the replacement of specific assets to ensure efficient and effective implementation of this program.

Hydro will also refurbish or replace protection and control panels, wiring, cables, or auxiliary relays as required due to deterioration from environmental conditions, accidental damage, or the modification/addition of protection and control equipment required for the relay replacements.

6.1 Program Budget

The estimate for this program is shown in Table 2.

Table 2: Program Estimate ($000)[5]

Program Cost	2027	2028	Beyond	Total
Material Supply	135.0	483.2	0.0	618.2
Labour	388.3	1,020.9	0.0	1,409.2
Consultant	51.1	110.3	0.0	161.3
Contract Work	0.0	240.0	0.0	240.0
Other Direct Costs	39.5	120.6	0.0	160.1
Interest and Escalation	20.5	104.3	0.0	124.8
Contingency	65.8	235.0	0.0	300.8
Total	**700.1**	**2,314.2**	**0.0**	**3,014.3**

[4] Replacement of line, generator, or transformer protection may involve replacement of multiple protective relays.
[5] Numbers may not add due to rounding.

Chart 4 provides the five-year historical program expenditures, current year's forecasted expenditures, the proposed 2027–2028 program budget, and the forecast budget through 2031. The actual expenditures and budget fluctuate year-to-year due to the variation in the number of relays installed, the type of protection system, the execution approach, and the average cost from year to year.

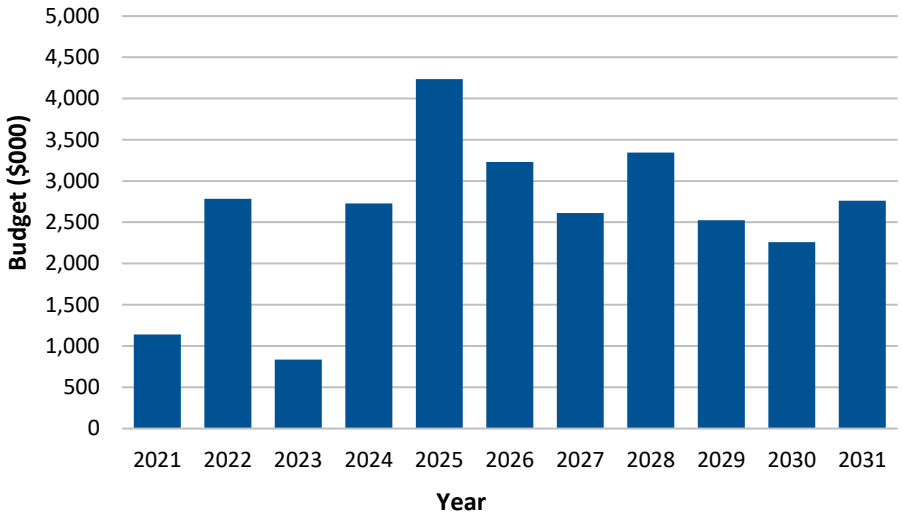


Chart 4: Historical and Forecast Program Budget

6.2 Program Schedule

The schedule for this program is shown in Table 3.

Table 3: Program Schedule

Activity	Start Date	End Date
Planning: Initial planning and scheduling.	January 2027	March 2027
Design: Prepare drawings and settings.	February 2027	August 2028
Procurement: Order relays and long lead items; Issue and award installation contract.	April 2027	September 2028
Construction/Commissioning: Complete protection upgrades.	September 2027	November 2028
Closeout: Completion of closeout documentation.	November 2028	December 2028

7.0 Conclusion

The work identified within this program is required to replace aging and obsolete equipment to allow Hydro to continue to provide safe, reliable, least-cost electricity in an environmentally responsible manner. The replacements are based upon assessments of the in-service equipment, consistent with Hydro's Terminal Station Asset Management Strategy. Hydro recommends completing these upgrades and replacements to ensure that protective relays will operate when required to protect electrical equipment during abnormal operating conditions.

Appendix A

Five-Year Plan





Assets planned for replacement from 2027 to 2031 under the Replace Protective Relays Program are provided in Table A-1 to Table A-5.

Table A-1: Assets Planned for Replacement in 2027

Name	Voltage of Protected Equipment (kV)
Bay d'Espoir Terminal Station 2 Transformer T11	69
Cat Arm Unit G2	13.8
Cat Arm Transformer T2	230
Hardwoods Transformer T1 and GT1	230
Howley Transformer T2, Annunciator and Synchronization[6]	138
Massey Drive Bus B2B3	69
Massey Drive Bus B4	69
Massey Drive Transformer T2	230
Oxen Pond Transformer T2	230
Wabush Terminal Station Transmission Line L6	46

Table A-2: Assets Planned for Replacement in 2028

Name	Voltage of Protected Equipment (kV)
Deer Lake Bus B2	69
Deer Lake Transformer T1	138
Hardwoods Bus B6B7	66
St. Anthony Diesel Plant TS Transformer T1	69
Stony Brook Bus B1B2	230
Stony Brook Bus B3	138
Sunnyside Bus B1	230
Sunnyside Transmission Line TL212	138

[6] Howley Transformer T2 and Annunciator are planned to be completed in the first year of the 2027-2028 program; all other protections in this program are planned to be completed in 2028, per Table A-2.

Table A-3: Assets Planned for Replacement in 2029

Name	Voltage of Protected Equipment (kV)
Bottom Waters Transformer T1	69
Cow Head Transmission Line TL227	69
Deer Lake Transmission Line TL239	138
Hardwoods Transformer T4	230
Hinds Lake Iso-Phase Bus	13.8
Hinds Lake Transmission Line TL243 and Main Bus	138
Stoney Brook Synchronizing	230
Wabush TS Station Service Gnd Transformer SS2	46
Western Avalon Bus B1	66
Western Avalon Bus B2	66

Table A-4: Assets Planned for Replacement in 2030

Name	Voltage of Protected Equipment (kV)
Barachoix Transformer T1	69
Berry Hill Bus 1 and Transformer T1	138
Berry Hill Synchronization and Transmission Line TL239 Metering	138
English Harbour West Transformer T1	69
Howley Bus B1	138
Oxen Pond Bus B2	230
Oxen Pond Bus B5	230
Springdale Bus 1	138
Springdale Synchronization Check and Annunciator	138
Wabush TS Bus B1	230

Table A-5: Assets Planned for Replacement in 2031

Name	Voltage of Protected Equipment (kV)
Buchans Transformer T2, Bus B2 and Gnd Transformer GT1	66
Happy Valley Transformer T1 and Annunciator	138
Happy Valley Transformer T2	138
Hardwoods Transformer T5	69
Oxen Pond Capacitor Bank 1	69
Oxen Pond Capacitor Bank 2	69
Stephenville TS Synchronizing and 405L Metering	66
Wabush TS Capacitor Bank 2	46

Terminal Station In-Service Failures

(2027)



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Terminal Station In-Service Failures (2027)

Location: Various

Investment Classification: Renewal

Asset Category: Terminal Stations

Estimated Cost: $2,203,300

1.0 Introduction

Newfoundland and Labrador Hydro ("Hydro") conducts asset management activities to proactively identify, replace, repair, or refurbish equipment to minimize the disruption of service and to avoid unsafe working conditions due to equipment failure. An objective of Hydro's Asset Management Program is to identify refurbishment and replacement activities that require approval by the Board of Commissioners of Public Utilities ("Board") in time to be included in Hydro's annual capital budget application ("CBA"). This is achieved through the Preventive Maintenance Program using various condition-based assessments and testing procedures.

Hydro has had success in projecting the deterioration rate of equipment for submission of refurbishment or replacement work into CBAs. However, there are situations where immediate refurbishment or replacement must be completed due to the occurrence of an actual failure, the identification of an incipient failure, or the determination of faster-than-anticipated equipment deterioration. These situations can be caused by events such as vandalism, storm damage, lightning, accidental damage, abnormal system operations, corrosion, and wear of mechanical components. Hydro uses historical data and engineering judgment to predict the magnitude of in-service failure expenditures.

2.0 Program Description and Justification

Due to the nature of terminal station equipment and infrastructure, unanticipated failures and deterioration will occur. Under the Terminal Station In-Service Failures Program, Hydro is proposing to undertake the immediate capital refurbishment and replacement work required to maintain the safe and reliable operation of its terminal station assets and to ensure the availability of capital spares required to support such work. Deferral of work justified under this program could result in a detrimental impact on customer power supply or an unacceptable risk to workers or public safety.

Required work will be evaluated to determine the appropriate form of execution as an in-service failure, an Allowance for Unforeseen Item, or a supplemental project.

Throughout 2027, Hydro may purchase capital spares identified as requiring immediate procurement to offset deficiencies in its capital spares inventory. Hydro does not have any planned capital spare acquisitions identified under this program in 2027.

3.0 Asset Overview

3.1 Asset Background

The assets requiring immediate, unplanned replacement or refurbishment work in a given year cannot be identified in advance. The assets covered within the Terminal Station In-Service Failures Program are generally included in the following broad asset classes:

- Instrument transformers;
- Disconnect switches;
- Surge arresters;
- Insulators;
- Grounding systems;
- Power transformers;
- Circuit breakers;
- Station service equipment;
- Battery banks and chargers;
- Station lighting;
- Synchronous condensers and associated equipment;
- Equipment foundations;
- Protection, control, and monitoring systems; and
- Auxiliary equipment.

For further information on the work executed under the Terminal Station In-Service Failures (2025) program that individually exceeded $750,000, please refer to Hydro's "Capital Expenditures and Carryover Report for the Year Ended December 31, 2025".[1]

3.2 Asset Condition

Assets replaced or refurbished under this program have experienced unplanned failure or exhibit signs of incipient failure; therefore, these assets have reached the end of their service life.

3.3 Asset Ages

The age of assets potentially covered under this program varies. Unplanned replacement or refurbishment activities due to failure may be necessary at any time during the asset lifecycle.

4.0 Trending

Hydro implemented the Terminal Station In-Service Failures Program in 2017. Over the past five years, on average, Hydro has executed 11 unplanned projects per year under the program.

4.1 Assets Installed/Replaced/Upgraded

The number of unplanned in-service failures projects initiated under the program over the past five years is provided in Chart 1. Hydro anticipates that unplanned failures will continue to occur, given the age and number of terminal station assets covered under the program. Hydro continues to plan the budget for this program based on historical information.

[1] Provided as Appendix B to Schedule 5 of this application.

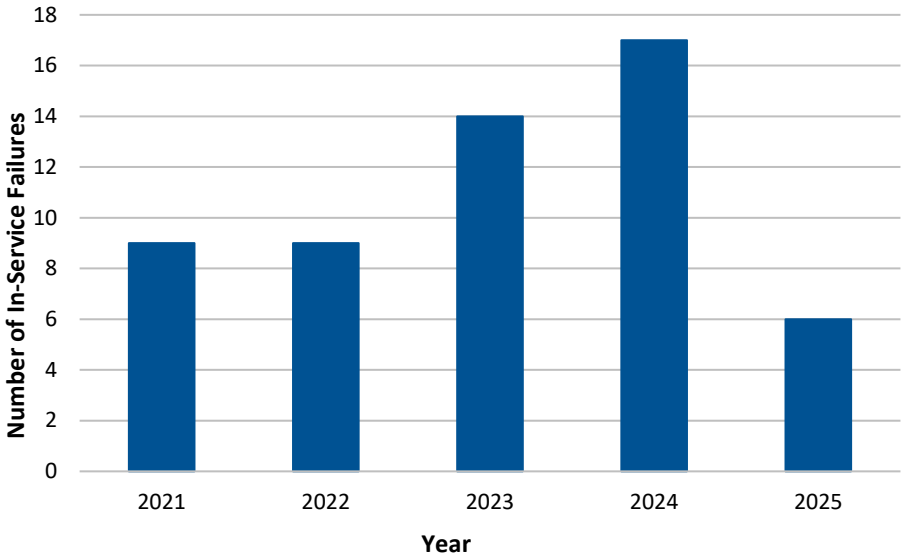


Chart 1: In-Service Failure Frequency

4.2 Historical and Forecast Average Unit Costs

Historical and forecast program costs are provided in Chart 2 in Section 6.1. Due to the nature of this program and the range of assets covered, average unit cost information is not applicable. An increase in program cost is forecast based on the anticipated escalation of both material and labour costs.

4.3 Historical Reliability

As this program addresses a wide range of asset types, the specific assets to be addressed within this program for 2027 are not known. As such, historical reliability data for the individual assets covered within this program is not applicable.

5.0 Analysis

5.1 Evaluation of Alternatives

Depending on the nature of each failure, or incipient failure, Hydro reviews viable technical alternatives to determine the most appropriate solution to address the unplanned event while balancing urgent safety and operational risks.

Due to the urgent nature of work executed under this program, seeking approval through a supplemental capital expenditures application or deferring the work for inclusion in the next CBA are not viable alternatives. The alternative of executing required unplanned work under the Allowance for

Unforeseen Items Account is also considered on a case-by-case basis, subject to the requirements set out by the Board for the use of the account.

5.1.1 Risk of Asset Stranding

Assets replaced or refurbished under this program have an inherently low risk of asset stranding. The assets covered under this program are critical to Hydro's ability to meet customer requirements. Hydro does not currently plan to retire any of its terminal stations. The risk of asset stranding would be considered on a case-by-case basis, if applicable.

5.1.2 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027 program in accordance with Hydro's Capital Risk Assessment process, as outlined in Section 7.0 of Schedule 1.0. The outcome of this assessment is provided in Table 1.

Table 1: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	3	5	**15**
Post-Implementation	3	1	**3**
		Risk Mitigated	**12**
		Risk Mitigated per $1 Million	**5.4**

6.0 Scope of Work

6.1 Program Budget

The estimate for the 2027 program is shown in Table 2. The estimate is based on the average expenditures from 2023 to 2025. The details of each scope covered under this program that individually exceeded $750,000, including the associated assets and costs, as well as the total program expenditures for each year, are filed with the Board within Hydro's annual Capital Expenditures and Carryover Report.[2] Work executed under the 2027 program that individually exceed $750,000 will be reported to the Board in Hydro's 2027 Capital Expenditures and Carryover Report.[3]

[2] Hydro's most recent Capital Expenditures and Carryover Report was filed with the Board on April 1, 2026.
[3] Hydro's 2027 Capital Expenditures and Carryover Report is to be filed on or before April 1, 2028.

Table 2: Program Estimate ($000)[4]

Program Cost	2027	2028	Beyond	Total
Material Supply	1,590.4	0.0	0.0	**1,590.4**
Labour	142.2	0.0	0.0	**142.2**
Consultant	63.0	0.0	0.0	**63.0**
Contract Work	300.0	0.0	0.0	**300.0**
Other Direct Costs	10.9	0.0	0.0	**10.9**
Interest and Escalation	96.7	0.0	0.0	**96.7**
Contingency	0.0	0.0	0.0	**0.0**
Total	**2,203.3**	**0.0**	**0.0**	**2,203.3**

The Terminal Station In-Service Failures Program started in 2017. Chart 2 provides the five-year historical expenditures since 2021, the forecast 2026 expenditures, the proposed 2027 program budget, and the forecast costs through 2031. As Hydro cannot predict the quantity and the nature of failures to be addressed within this program for future years, Hydro has forecast future expenditures for this program based on the 2027 program budget with cost escalation applied.

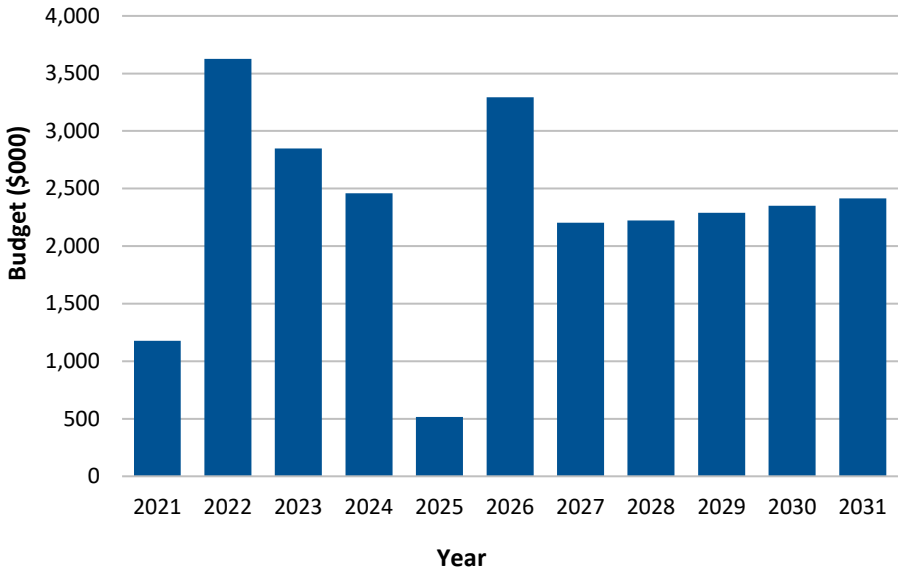


Chart 2: Historical and Forecast Program Budget

[4] Numbers may not add due to rounding.

6.2 Program Schedule

Work schedules are established subsequent to an unplanned failure or incipient failure event.

7.0 Conclusion

The Terminal Station In-Service Failures Program allows Hydro to undertake timely refurbishment and replacement work that is not included in its Preventive Maintenance Program, supporting Hydro's effort to maintain safe and reliable operations, in an environmentally responsible manner. This program will also allow Hydro to continue to proactively manage the pool of capital spare equipment to maintain the integrity and reliability of the electrical system.

Purchase Tools and Equipment

(2027)



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Purchase Tools and Equipment (2027)

Location: Various

Investment Classification: General Plant

Asset Category: Tools and Equipment

Estimated Cost: $2,176,000

1.0 Introduction

Newfoundland and Labrador Hydro ("Hydro") requires specific tools and equipment to ensure the delivery of safe, reliable, least-cost electricity in an environmentally responsible manner. This program outlines the purchase of tools and equipment that support the operation of Hydro's generation, transmission, and distribution systems.

2.0 Program Description and Justification

Hydro requires an adequate supply of tools and equipment to safely maintain reliable service to customers; therefore, it is necessary to add or replace tools and equipment required to complete system work.

Tools and equipment procured through this program are primarily driven by the operating requirements of Hydro's Generation, Telecontrol, and Transmission and Rural Operations ("TRO") groups. Required tools and equipment differ for each group, and cannot be shared due to operational restrictions. Proposed expenditures in 2027 are primarily the result of increased live line work, replacement of deteriorated tools or equipment, and required safety equipment.[1]

3.0 Asset Overview

3.1 Asset Background

Assets purchased as part of this program vary based on the requirements of the business in the year of project execution. Tools and equipment purchased under this program support daily operations, align with safety procedures and allow Hydro to maintain reliable service to customers.

[1] Examples of tools and equipment proposed for purchase as part of the 2027 program include: safety railing, storage cabinet, snow blower, and hand tools.

3.2 Asset Condition

Assets replaced or refurbished under this program have experienced unplanned failure or exhibit signs of incipient failure; therefore, these assets have reached the end of their serviceable life.

3.3 Asset Ages

The age of assets replaced or refurbished under this program varies. Unplanned replacement or refurbishment activities due to failure may be necessary at any time during the asset lifecycle.

4.0 Trending

4.1 Assets Installed/Replaced/Upgraded

Relating to historical, proposed, and planned units, Hydro has begun trending the purchasing of tools and equipment, tracking the three main groups–Generation, TRO, and Telecontrol, as seen in Chart 1, Chart 2, and Chart 3, respectively. The trending identifies the historical and forecasted budgets each year within the three main groups.

Assets within this program vary from large equipment such as snowblowers and scissor lifts to minor miscellaneous power/hand tools; therefore, individual tracking of each item requires significant effort and provides limited value.

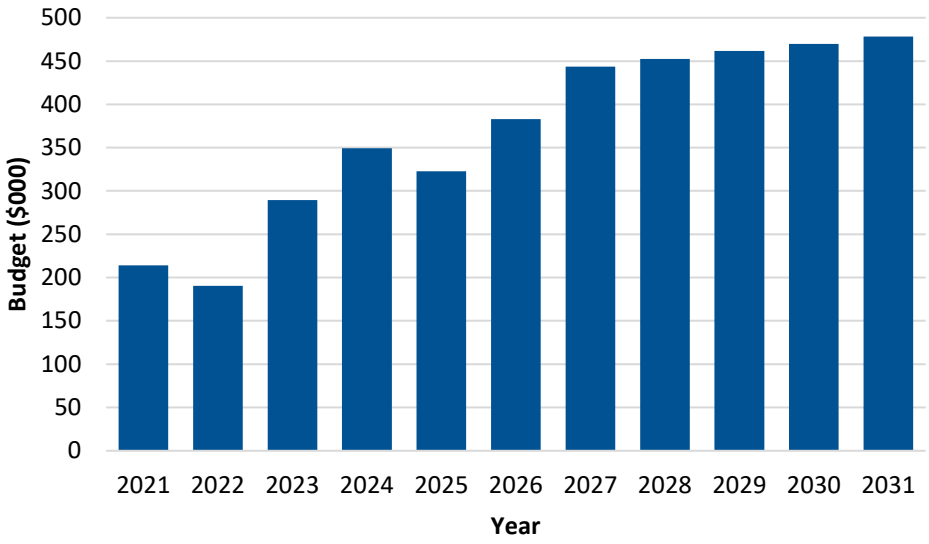


Chart 1: Historical and Forecast Budget–Generation

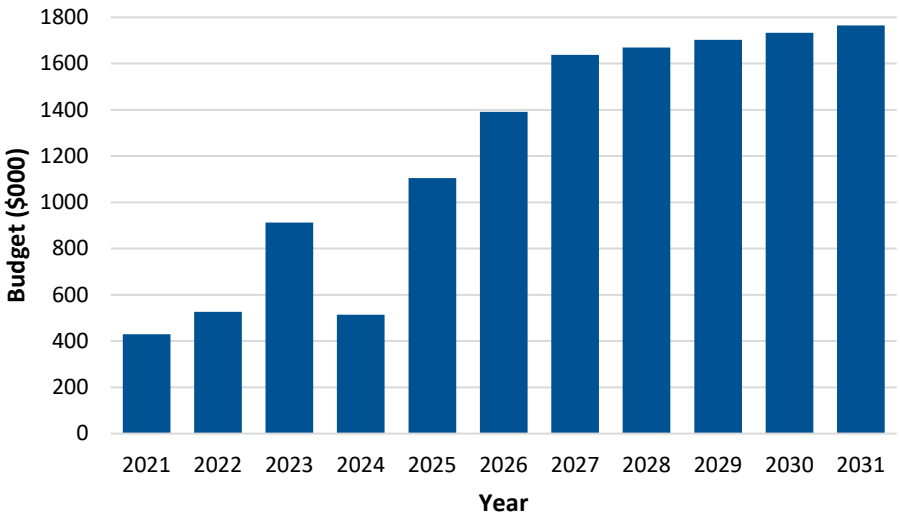


Chart 2: Historical and Forecast Budget–TRO

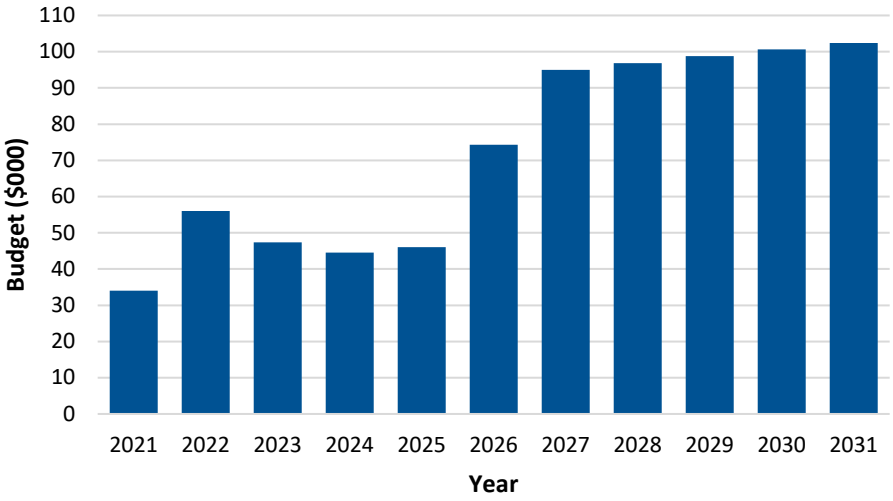


Chart 3: Historical and Forecast Budget–Telecontrol

4.2 Historical and Forecast Average Unit Costs

Historical and forecast program costs are provided in Chart 4 in Section 6.1. Due to the nature of this program and the range of assets covered, average unit cost information is not applicable.

4.3 Historical Reliability

Due to the nature of this program and the range of assets covered, historical reliability data for the individual assets covered within this program is not applicable.

5.0 Analysis

5.1 Evaluation of Alternatives

Hydro evaluated the following alternatives:

- Pace reduction;
- Pace advancement;
- Continuation at current pace; and
- Alternative strategies.

5.1.1 Pace Reduction

Hydro has not identified any pace reduction options for this program. Hydro requires tools and equipment to support the safe and reliable operation of the electrical system and evaluates tool and equipment requirements on an annual basis, proposing the procurement of those necessary to support system operations. Delayed procurement of these tools and equipment is therefore not considered a viable option.

5.1.2 Pace Advancement

Hydro has not identified any need to advance the procurement of tools and equipment. Therefore, this is not considered a viable alternative.

5.1.3 Continuation at Current Pace

Continuing the program at the current pace would allow for the purchase of necessary tools and equipment for employees to complete their work in managing the province's electricity grid, without undue cost to customers.

5.1.4 Alternative Strategies

This program is for the purchase of specific tools and equipment that have been identified for purchase in 2027. These tools and equipment are required to ensure the delivery of safe, reliable, least-cost electricity in an environmentally responsible manner; therefore, there are no other alternatives.

5.2 Least-Cost Evaluation

Hydro has not identified any viable alternatives to facilitate a least-cost evaluation.

5.3 Recommended Alternative

Hydro believes procuring the proposed tools and equipment at the current pace allows for the provision of components to complete the necessary work to manage the province's electrical grid, which achieves an appropriate balance of reliability, lowest cost, and environmental responsibility.

5.3.1 Risk of Asset Stranding

Assets replaced or refurbished under this program have an inherently low risk of asset stranding. The assets covered under this program are critical to Hydro's ability to meet customer requirements and support Hydro's day-to-day operations. The risk of asset stranding would be considered on a case-by-case basis. The assets purchased under this program can generally be redeployed should the service requirements change in a given location.

5.3.2 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027 program in accordance with Hydro's Capital Risk Assessment process, as outlined in Section 7.0 of Schedule 1. The outcome of this assessment is provided in Table 1.

Table 1: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	4	3	**12**
Post-Implementation	4	1	**4**
		Risk Mitigated	**8**
		Risk Mitigated per $1 Million	**3.7**

6.0 Scope of Work

The scope of work of this program covers the annual expenditures required for the purchase of tools and equipment to execute safe, reliable work. Tools and equipment identified under this program are required to support day-to-day operations within Hydro's Generation, Telecontrol, and TRO groups. The scope of work includes the purchase and procurement of tools and equipment and does not include any costs associated with the installation of these items.

6.1 Program Budget

The estimate for this program is shown in Table 2.

Table 2: Program Estimate ($000)[2]

Program Cost	2027	2028	Beyond	Total
Material Supply	1,674.8	0.0	0.0	**1,674.8**
Labour	246.9	0.0	0.0	**246.9**
Consultant	0.0	0.0	0.0	**0.0**
Contract Work	0.0	0.0	0.0	**0.0**
Other Direct Costs	0.0	0.0	0.0	**0.0**
Interest and Escalation	62.2	0.0	0.0	**62.2**
Contingency	192.2	0.0	0.0	**192.2**
Total	**2,176.0**	**0.0**	**0.0**	**2,176.0**

The program costs are broken down between Generation, TRO, and Telecontrol as follows:[3]

- Generation: $443,700
- TRO: $1,637,300
- Telecontrol Services Cost: $95,000

Chart 4 provides the five-year historical program expenditures, the forecast 2026 expenditures, the proposed 2027 program budget, and the forecast budget through 2031. Increased expenditures in 2027 are primarily the result of new tools and equipment required for increases in live line work being completed internally in 2027, replacement of deteriorated tools and equipment, and required safety equipment. The forecast future expeditures are based on the 2027 values with escalation applied.

[2] Numbers may not add due to rounding.
[3] Numbers may not add due to rounding.

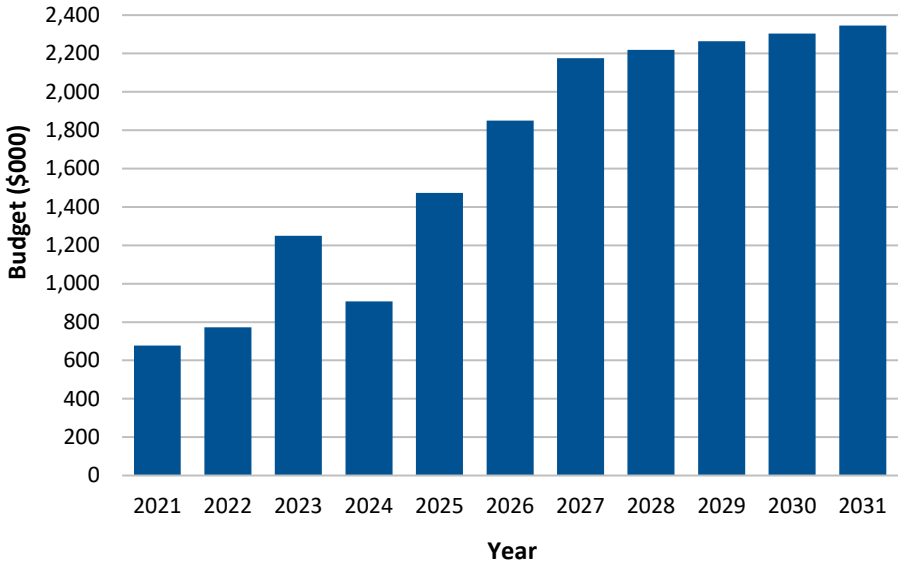


Chart 4: Historical and Forecast Program Budget

6.2 Program Schedule

This program is for the purchase of specific tools and equipment in 2027 that involves no construction or unit outages; therefore, the main milestone for this program is to have the identified tools and equipment on-site as required and before the end of 2027.

7.0 Conclusion

Hydro requires specific tools and equipment to ensure the delivery of safe, reliable, least-cost electricity in an environmentally responsible manner. This program provides for the purchase of tools and equipment that support the operation and maintenance of Hydro's generation, transmission, and distribution systems; it is necessary to add or replace tools and equipment that are required to complete this work. Hydro proposes these purchases to ensure all operational groups have the proper tools and equipment to safely perform required tasks.

Renew Circuit Breakers

(2027–2029)

newfoundland labrador hydro



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Appendix A: Renew Circuit Breakers Program – 2027–2031 Plan

Renew Circuit Breakers (2027–2029)

Location: Various

Investment Classification: Renewal

Asset Category: Terminal Stations

Estimated Cost: $1,950,500

1.0 Introduction

Circuit breakers are critical components of the power system. Located in terminal stations, circuit breakers perform switching actions that are necessary to complete, maintain, and interrupt current flow under normal or fault conditions.[1] The reliable operation of circuit breakers is essential to protect and maintain the stability of the power system.

2.0 Program Description and Justification

This program is required for Newfoundland and Labrador Hydro ("Hydro") to provide safe, reliable electrical service in an environmentally responsible manner, consistent with least cost. In line with Hydro's established plan for the renewal of circuit breakers, and to ensure an appropriate balance between cost and reliability for customers, Hydro is focused on optimizing the useful life of its in-service circuit breakers. This philosophy differs depending on the type of circuit breaker. For SF_6[2] circuit breakers, refurbishment is typically scheduled after 20 years of service and replacement is considered at approximately 40 years of service, depending on the condition and operational history of the circuit breaker. For minimum oil circuit breakers, Hydro will proceed with the removal and replacement of those that have been designated as obsolete. This action follows official notification from the Original Equipment Manufacturer ("OEM") indicating that technical support and spare parts for these units are no longer available, thereby confirming their obsolescence.

For 2027–2029, Hydro is proposing the refurbishment of two circuit breakers, and the replacement of one circuit breaker and two circuit switchers under this program.

[1] For the purposes of this program, a circuit switcher is considered a circuit breaker and is included within the scope of the program.
[2] Sulfur hexa-flouride ("SF_6").

3.0 Asset Overview

3.1 Asset Background

Hydro maintains two different types of circuit breakers—oil and SF_6—that operate across three different voltage classes.

Each type of circuit breaker has unique operating characteristics. Oil circuit breakers extinguish the electrical arc created inside the circuit breaker using insulating oil. SF_6 circuit breakers use SF_6 gas as an insulating medium to quench the electrical arcs created during switching.

Circuit breakers are comprised of two primary components:

- Interrupting device, which includes the arc-quenching medium; and
- Insulating material and operating mechanism.

Oil circuit breakers and SF_6 circuit breakers are designed and constructed differently; as such, refurbishment requirements vary for each type of circuit breaker. The SF_6 circuit breakers typically require refurbishment at approximately 20 years (i.e., halfway through the expected useful life). Oil circuit breakers are an older technology; therefore, replacements will be completed after 40 years. However, as SF_6 circuit breakers near replacement, a further condition assessment will be completed to determine if life extension can be achieved through refurbishment. One of the circuit breakers included in the 2027–2029 program scope of the 2027 Capital Budget Application ("CBA") is a minimum oil circuit breaker following OEM confirmation of their obsolescence and withdrawal of support.

As of the end of 2025, Hydro has 218 SF_6 breakers, six minimum oil breakers and two bulk oil breakers in its 46 kV and above circuit breaker fleet. The two bulk oil breakers were tested for PCBs[3] and results showed that they contain less than 50 ppm, which allows them to remain in service as per the PCB regulations.

[3] Polychlorinated biphenyl ("PCB")

3.2 Asset Condition

Asset condition for circuit breakers is defined by risk of failure and quantified in Table 1.

Table 1: Asset Condition for Circuit Breakers

Asset Condition Category	Risk of Failure
5	>90%
4	50-90%
3	10-50%
2	1-10%
1	<1%

In alignment with Hydro's current asset management philosophy, circuit breakers are assessed for condition as they approach 40 years of age. As a result, the inclusion criteria for asset condition scoring in this section only includes SF_6 circuit breakers aged 35 years or older. Breakers that are being refurbished at mid-life have not been included in the asset condition scoring, as this scoring is strictly age-based. Some breakers within Asset Condition Category 1 are planned for replacement in the next five years due to their age and the availability of replacement parts. Chart 1 presents the asset condition categories for breakers aged 35 years or older. Eligibility is determined based on the circuit breaker refurbishment/replacement criteria outlined in Hydro's Terminal Station Asset Management Strategy.[4]

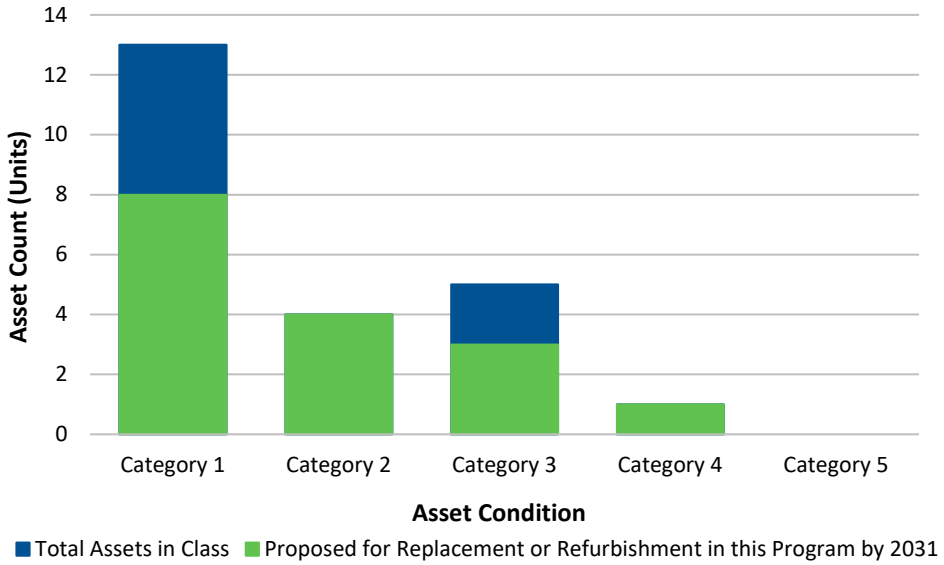


Chart 1: Asset Condition for Assets 35 Years and Older

[4] Provided as Appendix F to Schedule 1 of this application.

3.3 Asset Ages

The age of the circuit breakers proposed for replacement or refurbishment as of 2026 is provided in Chart 2. Two breakers are being refurbished, and one breaker and two circuit switchers are being replaced as part of the 2027–2029 program. Within the circuit breaker fleet, Hydro has more than 30 circuit breakers that range from 40–60 years of age that are in service. A number of the circuit breakers within Hydro's system have been operational for more than 30 years, with a significant number nearing or having already surpassed the expected useful life of such assets.[5] The probability of circuit breaker failure increases with age. The assets being replaced are between 41 and 60 years old. The breakers being refurbished are between 21 and 30 years old.

Chart 2 provides the asset age for all assets.

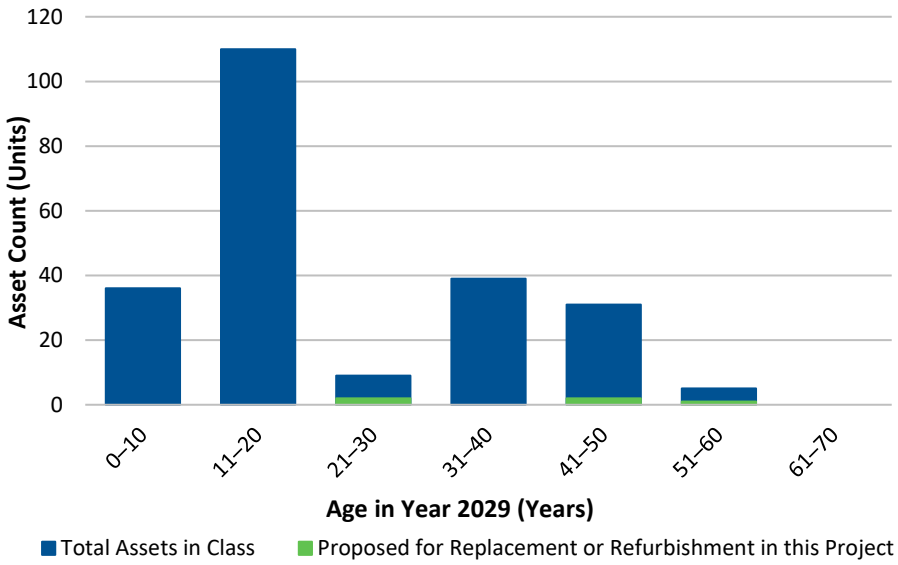


Chart 2: Asset Counts by Asset Age

4.0 Trending

4.1 Assets Installed/Replaced/Upgraded

Under this program, breakers and circuit switchers are refurbished or replaced based on age and condition. Chart 3 and Chart 4 provide the five-year historical, current, and five-year forecast number of assets to be replaced or refurbished, respectively, per year.

[5] Expected useful life is estimated to be 40 years.

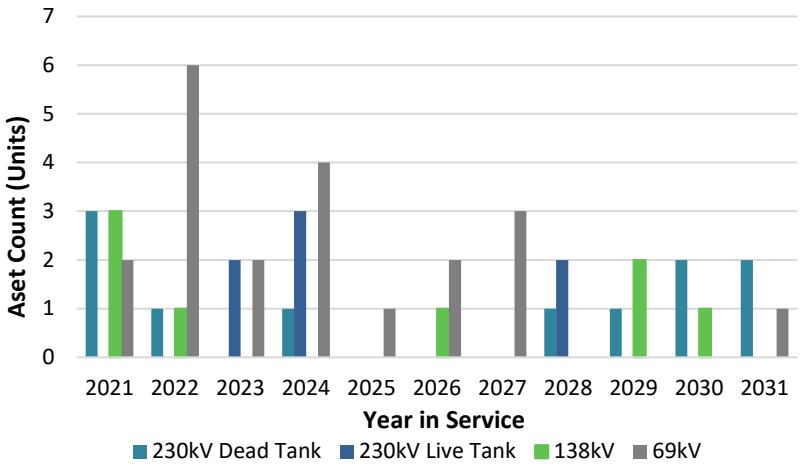


Chart 3: Historical and Forecast Number of Assets Replaced

The number of 138 kV and 230 kV circuit breaker replacements is expected to stay relatively stable. The majority of circuit breakers in these voltage classes are air-blast circuit breakers, which were largely replaced between 2015 and 2023. Replacements of 69 kV circuit breakers peaked in 2022, and are projected to continue to decrease into the future, as Hydro phases out aging oil circuit breakers to transition away from older technologies.[6]

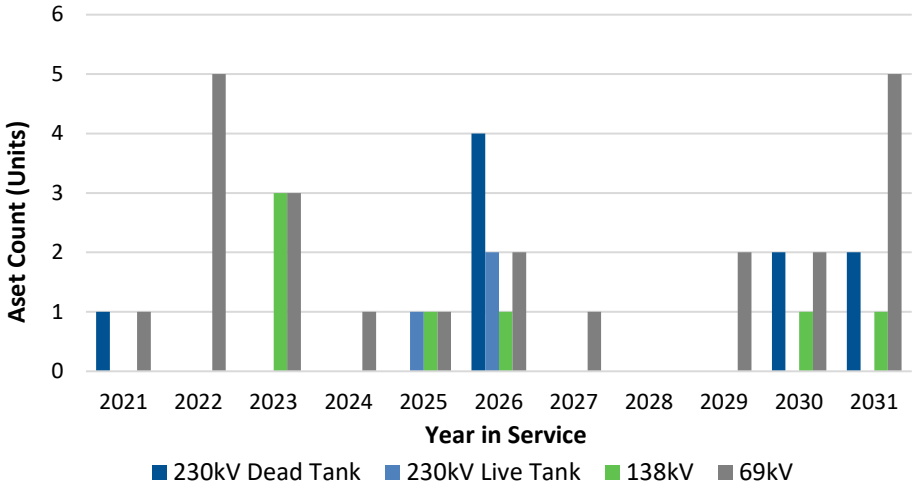


Chart 4: Historical and Forecast Number of Assets Refurbished

[6] The number of breaker replacements prior to 2025 is related to efforts to comply with federal environmental PCB regulations.

The number of circuit breakers proposed for refurbishment varies from year to year. Circuit breakers are planned for refurbishment at approximately 20 years of age, and also at approximately 40 years of age, if their condition is satisfactory and does not warrant replacement at that time. There are no circuit breakers scheduled for refurbishment in 2028, as none satisfy the established criteria.

4.2 Historical and Forecast Average Unit Costs

Chart 5 and Chart 6 show the average unit costs for replacements and refurbishments, respectively. While the unit cost for breaker replacements is consistent for each voltage class year over year, the overall costs vary by breaker voltage class, as shown in Chart 5. The 230 kV live tank breaker replacement costs have been lower than the average replacement cost for 230kV dead tank circuit breakers,[7] as they generally exclude any cable replacements or protection upgrades.

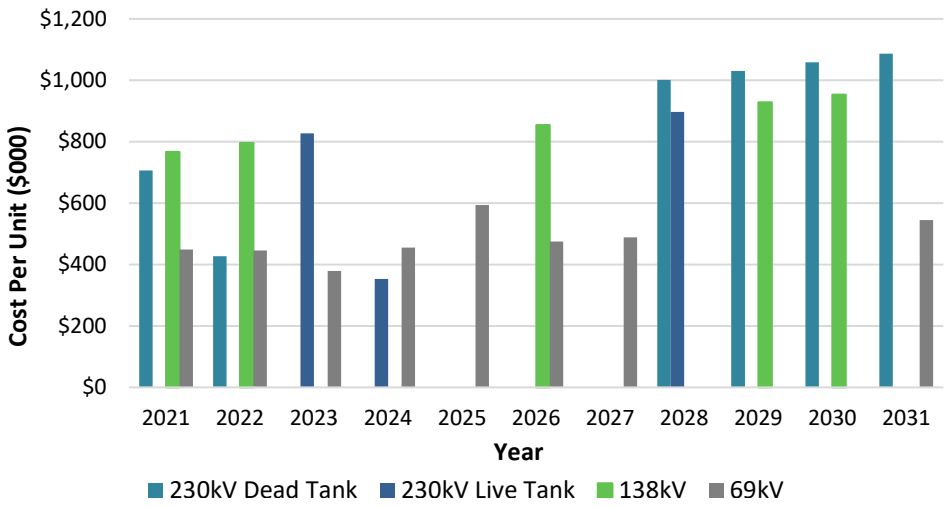


Chart 5: Historical and Forecast Average Unit Costs of Assets Replaced

The breaker refurbishment costs vary between breaker type and manufacturer; as such, unit costs per year can vary, depending on the types of breakers refurbished. The elevated average unit cost for the 230 kV live tank breakers in 2025 is attributable to the specific breaker model refurbished. The refurbishment was for a Brown Boveri ELF-type breaker, which required OEM-specialist technicians and proprietary, limited-availability parts, resulting in higher refurbishment costs than typical breaker models.

[7] The procurement cost of a 230 kV dead tank circuit breaker is in excess of $500,000.

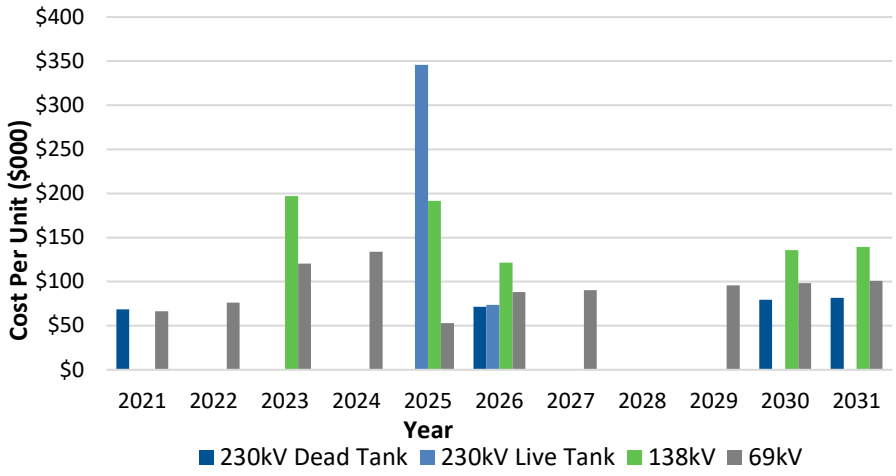


Chart 6: Historical and Forecast Average Unit Costs of Assets Refurbished

4.3 Historical Reliability

A listing of sustained forced outages for the last five years is shown in Table 2.

Table 2: Circuit Breaker Outages and Durations from 2021 to 2025

Start Date	Breaker	Outage Duration (minutes)
3-Dec-2025	Doyles B1L15	19
26-Sep-2025	Holyrood B8L39	6
26-Jun-2025	Holyrood B7L2	22
1-Apr-2025	Sunnyside B3T4	22
5-Jan-2025	Holyrood B8L39	231
2-Jan-2025	Wabush B4L6	34
19-Oct-2024	Wabush B3L3	58
18-Oct-2024	Massey Drive T1	22
16-Jul-2024	Paradise River L58T1	3
15-Jul-2024	Buchans B2L64	231
16-Mar-2024	Narrows B1L36	550
14-Nov-2023	St. Anthony Airport B1C2	6,139
30-Sep-2023	Voisey's Bay Nickel B1T1	1,789
30-Mar-2023	St. Anthony Airport B1T1	24
21-Jan-2023	Holyrood B8L39	13
21-Dec-2022	St. Anthony Airport B1C3	731
10-Dec-2022	St. Anthony Airport B1C3	817
21-Oct-2022	Cow Head B1L27	36
1-Sep-2022	Indian River B1L363	868
2-Jul-2022	Happy Valley 13-1	2
8-Jun-2022	Happy Valley 13-1	19
10-May-2022	Peter's Barren B1L41	5
24-Dec-2021	Doyle's SB1L15	4
21-Nov-2021	St. Anthony B1T1	10
23-Oct-2021	St. Anthony B1C1	4
1-Sep-2021	Springdale B1L22	3
20-Aug-2021	Holyrood B8L39	2
27-Jul-2021	Indian River B1L23	1
27-Jul-2021	Indian River B1L24	1
9-May-2021	Buchans L28L32	521

5.0 Analysis

5.1 Evaluation of Alternatives

The following alternatives were considered:

- Pace reduction;
- Pace advancement; and

- Continue program at current pace.

5.1.1 Pace Reduction

Hydro reviews its circuit breaker renewal program regularly to determine if the pace can be reduced while maintaining reliable service to its customers. Hydro's current asset management strategy of conducting further condition assessments for circuit breakers nearing end of life and performing lower cost refurbishment to achieve additional life where appropriate is consistent with the least-cost service to customers. Further pace reduction of replacements is not a viable option as it will increase the risk of failure and will have a negative impact on system reliability.

5.1.2 Pace Advancement

Hydro has not identified any pace advancement options for this program.

5.1.3 Continuation of Program at Current Pace

As a result of increased equipment lead times, beginning in 2026, this work will be executed over three years instead of two, as is typical under the Renew Circuit Breakers program. As outlined herein, the refurbishment and replacement of circuit breakers in a planned, strategic manner is prudent and supports the reliable and safe operation of the assets. Such an approach enables Hydro to manage resource requirements and system outages to support its mandate to provide safe, reliable, least-cost electricity in an environmentally responsible manner.

5.2 Least-Cost Evaluation

Hydro has not identified any viable alternatives to facilitate a least-cost evaluation.

5.3 Recommended Alternative

Hydro recommends the refurbishment and replacement of circuit breakers as proposed. This approach is consistent with the methodology and philosophy outlined in Hydro's Terminal Station Asset Management Strategy and will ensure the safe and reliable operation of the circuit breaker fleet while effectively balancing costs.

5.3.1 Risk of Asset Stranding

With ongoing considerations related to load growth in Labrador, there is a risk that the Wabush Terminal Station breakers scheduled for replacement may not be required for the full extent of their useful life. If developments in Labrador West occur in the near term, newly-installed breakers will be

considered for redeployment in a different terminal station location or will become spares. Given that the other breakers identified in this proposal are expected to remain in-service for their full useful life, the risk of asset stranding is considered to be low.

5.3.2 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027–2029 program in accordance with Hydro's Capital Risk Assessment process, as outlined in Section 7.0 of Schedule 1. The outcome of this assessment is provided in Table 3.

Table 3: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	5	3	**15**
Post-Implementation	5	1	**5**
		Risk Mitigated	**10**
		Risk Mitigated per $1 Million	**5.1**

6.0 Scope of Work

Hydro's five-year plan for the Renew Circuit Breakers program is provided in Appendix A. Based on current condition and asset data, Hydro plans to replace two circuit switchers and one circuit breaker, and also refurbish two circuit breakers under this program scope, with completion scheduled by the end of 2029. Based on asset condition, and outage and resource availability at the time of execution, Hydro may advance or defer the replacement of specific assets to ensure efficient and effective implementation of this program.

6.1 Program Budget

The estimate for this program is shown in Table 4.

Table 4: Program Estimate ($000)[8]

Program Cost	2027	2028	Beyond	Total
Material Supply	0.0	0.0	349.2	349.2
Labour	58.7	72.1	734.6	865.5
Consultant	47.8	52.2	60.0	160.0
Contract Work	0.0	0.0	191.1	191.1
Other Direct Costs	7.1	18.8	29.0	54.8
Interest and Escalation	5.1	11.4	151.5	167.9
Contingency	11.4	14.3	136.4	162.1
Total	**130.0**	**168.9**	**1,651.6**	**1,950.5**

Chart 7 provides the five-year historical expenditures, the forecast 2026 expenditures, the proposed 2027–2029 program budget, and the forecast costs through 2031. Hydro notes that there has been a consistent year-over-year increase in breaker procurement costs. The budget is trending lower in future years compared to 2021–2024, as Hydro's remaining circuit breakers are replaced, fewer units meet the replacement criteria, and the life extension of SF_6 breakers through refurbishment reduces the need for new replacements. The increased number of breaker replacements prior to 2025 is primarily attributed to Hydro's efforts to replace air blast circuit breakers[9] and comply with the federal environmental PCB Regulations.[10]

This program budget covers all types and voltage classes of breakers; as such, it will inherently show variability depending on the number, type, and voltage class of breakers addressed each year.

[8] Numbers may not add due to rounding.
[9] As part of the Accelerated Breaker Replacement program, Hydro replaced air blast circuit breakers across the province due to reliability concerns and the unavailability of OEM spare parts, with the final replacements completed in 2023.
[10] All of the bulk-oil circuit breakers that are mandated for removal by 2025 as per the *Canadian Environmental Protection Act, 1999,* SC 1999, c 33*, PCB Regulations* (SOR/2008-273) will be completed by the end of 2025. The last of the affected breakers were approved for replacement as part of the 2024 CBA.

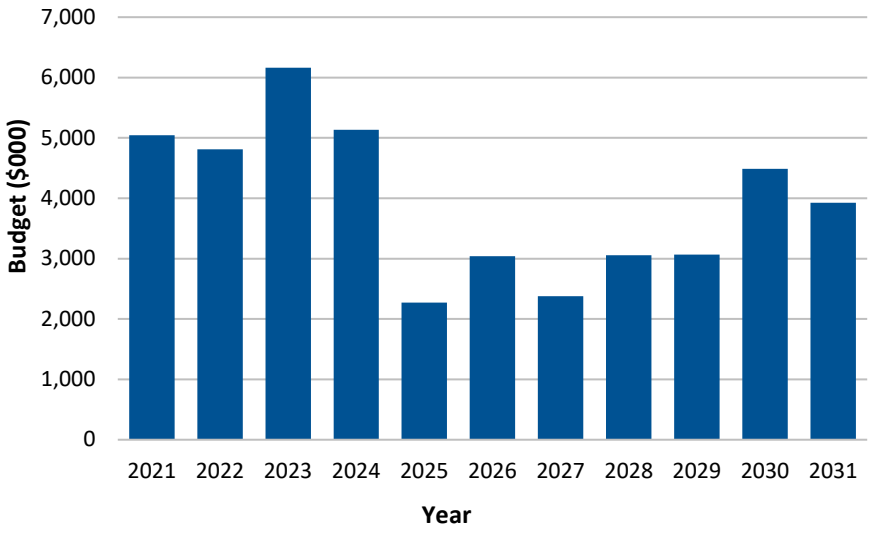


Chart 7: Historical and Forecast Program Budget

6.2 Program Schedule

The schedule for this program is shown in Table 5.

Table 5: Program Schedule

Activity	Start Date	End Date
Planning:		
Initial planning and scheduling.	January 2027	March 2027
Procurement:		
Order breakers and miscellaneous items.	March 2027	April 2029
Tender and award contracts	October 2028	April 2029
Detailed Design:		
Conduct site visits.	July 2027	September 2027
Complete detailed design.	March 2027	March 2029
Construction/Commissioning:		
Breaker replacements and refurbishments.	May 2029	November 2029
Closeout:		
Complete closeout documentation.	October 2029	December 2029

7.0 Conclusion

This proposal is seeking approval for the refurbishment of two circuit breakers and replacement of two circuit switchers and one circuit breaker by the end of 2029. The refurbishment and replacement of the

identified circuit breakers and circuit switchers are required to ensure the safe and reliable delivery of least-cost power in an environmentally responsible manner.

Assets planned for replacement or refurbishment from 2027 to 2031 under the Renew Circuit Breakers program are provided in Appendix A.

Appendix A

Renew Circuit Breakers Program

2027–2031 Plan

newfoundland labrador hydro

Table A-1: Assets Planned for Replacement or Refurbishment in 2027

Name	Voltage (kV)	Activity
Oxen Pond B2T2	69	Replacement
Wabush B4L6	46	Replacement
Wabush B4L35	46	Replacement
Hardwoods B7C1	69	Refurbishment

Table A-2: Assets Planned for Replacement or Refurbishment in 2028

Name	Voltage (kV)	Activity
Holyrood B13B15	230	Replacement
Holyrood B12L18	230	Replacement
Hardwoods B2L42	230	Replacement

Table A-3: Assets Planned for Replacement or Refurbishment in 2029

Name	Voltage (kV)	Activity
Bay d'Espoir B9L34	230	Replacement
Bottom Brook L14L50	138	Replacement
Bottom Waters L60T1	138	Replacement
Howley L51T2	69	Refurbishment
Wabush B4SS2	46	Refurbishment

Table A-4: Assets Planned for Replacement or Refurbishment in 2030

Name	Voltage (kV)	Activity
Bay d'Espoir B9B10	230	Replacement
Bay d'Espoir L06L34	230	Replacement
Berry Hill B1L59	138	Replacement
Springdale B1L22	138	Refurbishment
St. Anthony Airport B1T1	69	Refurbishment
Sunnyside L03L06	230	Refurbishment
Voisey's Bay Nickel B1T1	230	Refurbishment
Wabush B4L7	46	Refurbishment

Table A-5: Assets Planned for Replacement or Refurbishment in 2031

Name	Voltage (kV)	Activity
Bay d'Espoir B10B11	230	Replacement
Bay d'Espoir B7B11	230	Replacement
Wabush B4C2	46	Replacement
Bottom Brook B2L14	138	Refurbishment
Bay d'Espoir B13L20	69	Refurbishment
Hawkes Bay B1L21	69	Refurbishment
Holyrood B7L38	69	Refurbishment
Hardwoods B1L36	230	Refurbishment
Quartzite B2L40	46	Refurbishment
St. Anthony Airport B1L57	69	Refurbishment
Voisey's Bay Nickel B1T2	230	Refurbishment

Purchase Personal Computers

(2027)



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Purchase Personal Computers (2027)

Location: Various

Investment Classification: General Plant

Asset Category: Information Systems

Estimated Cost: $1,649,600

1.0 Introduction

Newfoundland and Labrador Hydro ("Hydro") personnel have been assigned a laptop, rugged mobile, desktop, or workstation computer to access business software applications. To support its business and maintain operational reliability for its software applications and information, Hydro must keep personal computing devices and accessories current.

2.0 Program Description and Justification

Hydro schedules replacement of desktop and workstation computers on a six-year lifecycle and laptop and rugged mobile computers on a five-year lifecycle. The replacement of monitors and other ancillary hardware is assessed based on failure, compatibility, breakage, loss, and application requirements.[1] If a user leaves the organization and their computer has not reached the maximum age/lifespan, it is reimaged and redeployed.

Personal computing devices must be current to provide the required performance and capacity to effectively run business applications. If personal computing devices are not current, the following scenarios could occur:

- Inability to install new software applications and upgrade existing applications;
- Decreased processing speed and increased potential for lost data;
- Cybersecurity risks due to unsupported operating systems for patches and vulnerability updates; and
- Decreased productivity during extended repair or reimaging processes.

[1] Hydro aims to repurpose existing devices where possible to address inventory replacements, and only purchases a replacement in cases where there are no devices of the correct type and minimum requirements available.

In December 2024, the *Hydro Corporation Act, 2007*, was repealed and replaced by the *Hydro Corporation Act, 2024,* which served to finalize the legal amalgamation of Nalcor Energy ("Nalcor") and Hydro. Resulting from amalgamation, Information Systems ("IS") assets were now subject to regulatory oversight, having been exempt under previous legislation.

In line with the Intercompany Transactions Costing Guidelines, computer purchases are charged directly to the applicable line of business. Historically, this program purchased personal computing equipment required for Hydro's regulated business segment only. Post-amalgamation, new IS assets and capital expenditures, as well as sustaining capital for existing assets, are subject to regulation under the *Public Utilities Act*. As a result, in 2027, the scope of devices and the associated budgets that are included within this program have increased to include assets historically purchased by Nalcor for the corporate services functions that are now part of the Hydro legal entity.

3.0 Asset Overview

3.1 Asset Background

Hydro operates and maintains approximately 1,400 personal computing devices, which include desktops, workstations, laptops, and rugged mobile devices, in addition to ancillary hardware (i.e., monitors, etc.) associated with those devices.[2]

A preliminary analysis based on Hydro's age-based replacement criteria identified the need to replace 275 personal computing devices. Hydro has also budgeted for an additional 22 inventory replacements, to take care of in-service failures, breakage or loss that occurs in 2027, bringing the number of computing devices purchased in this program's scope to 297. In 2027, the program budget also includes the replacement of ancillary hardware at a cost of $68,300.[3]

3.2 Asset Condition

Devices identified in this budget have been in service for a period of more than five years for laptops and rugged mobile computers, and more than six years for desktop and workstation computers and

[2] Excludes personal computing devices purchased directly by another line of business per the Intercompany Transactions Costing Guidelines.
[3] In 2027, Hydro is proposing to replace 273 monitors at a unit cost of approximately $250 each.

have exceeded the expected reliable lifespan. The replacement of monitors and other ancillary hardware is assessed based on failure, compatibility, and application requirements.

3.3 Asset Ages

The personal computing equipment proposed for replacement was purchased in 2021–2022. Chart 1 provides asset age for personal computing devices covered under the program.

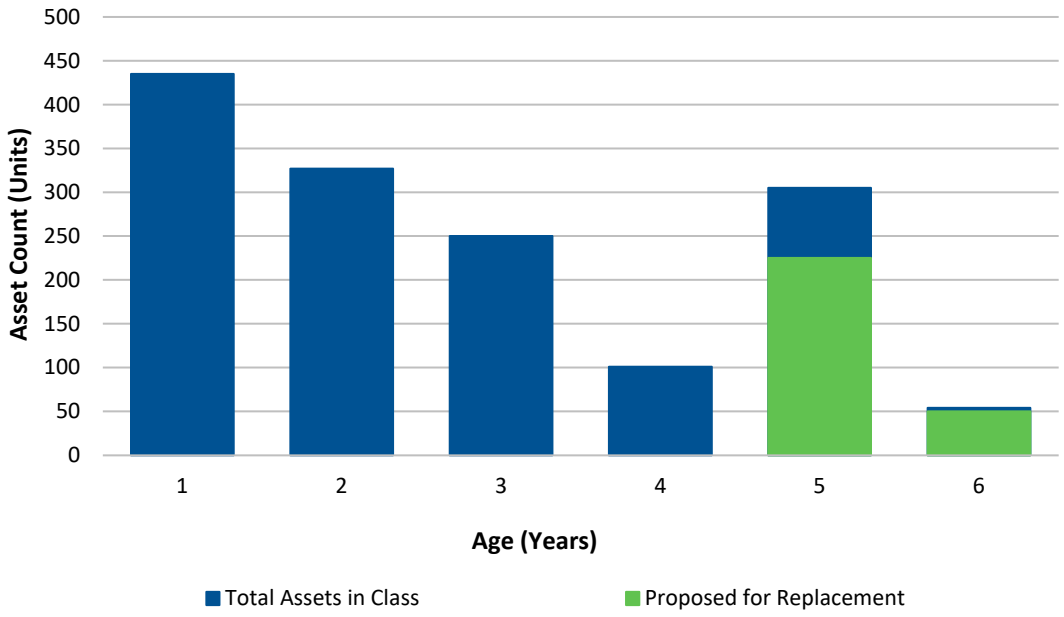


Chart 1: Asset Counts by Asset Age

4.0 Trending

4.1 Assets Replaced

Hydro replaces personal computers as the devices reach the end of their life. Chart 2 provides the five-year historical, current, and the five-year forecast number of assets replaced per year.

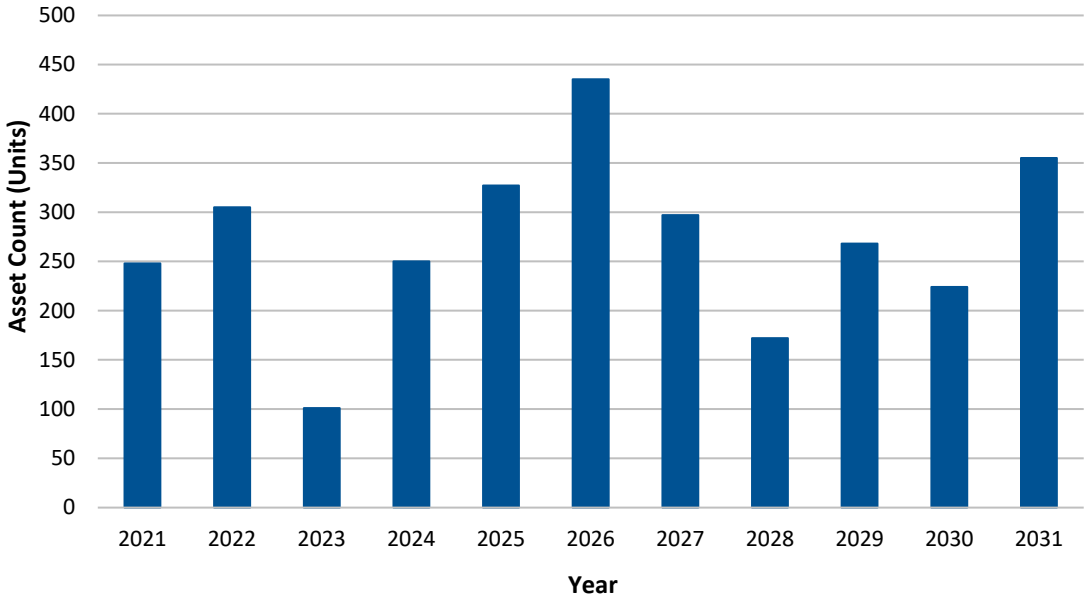


Chart 2: Historical and Forecast Number of Assets Replaced[4]

4.2 Historical and Forecast Average Unit Costs

Chart 3 provides the historical, current, and five-year forecast average unit cost of asset replacement in each year. Hydro currently has two laptop types in operation–standard, and rugged. Standard laptops account for approximately 98% of assets, whereas rugged laptops, which include rugged devices and workstations, account for approximately 2% of assets.[5] Higher cost per unit in 2027 is primarily attributed to the increased number of rugged devices and workstations, that carry a higher cost per unit, due for replacement.

[4] Data for 2021–2024 reflect the historical spending within this program, which includes assets purchased for Hydro's regulated business segment only.
[5] For further details, please refer to Hydro's response to CA-NLH-084 of the 2026 Capital Budget Application proceeding.

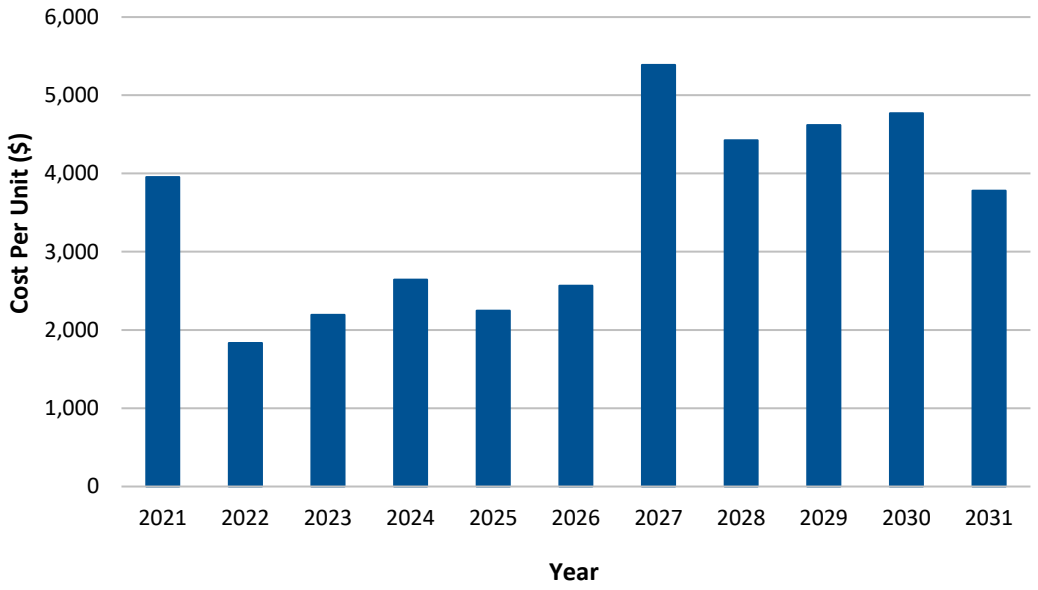


Chart 3: Historical and Forecast Average Unit Costs of Assets Replaced[6]

4.3 Historical Reliability

Hydro has determined its replacement schedule based on maximizing the use and lifetime of personal computers and related assets without leading to reliability issues. Computing devices that are not kept current risk reliability issues, including the inability to install new software applications and upgrade existing applications; decreased processing speed and increased potential for lost data; cybersecurity risks due to unsupported operating systems for patches and vulnerability updates; and decreased productivity during the repair or reimaging process.

5.0 Analysis

5.1 Evaluation of Alternatives

Hydro has evaluated the following alternatives:

- Pace reduction;
- Pace advancement; and
- Continuation at current pace.

[6] *Supra*, f.n. 4.

5.1.1 Pace Reduction

Under this scenario, the planned replacement of personal computing devices would be deferred, and the lifecycle would be increased. This would create an increased technical risk of the existing equipment no longer supporting new applications, interfaces, and other technologies. Cyber risks increase as vendors no longer release security patches for unsupported hardware and operating systems cannot be kept up-to-date due to legacy hardware support issues. Review and historical experience have shown that the risk is not acceptable. Higher maintenance costs would also be incurred when operating these devices beyond Hydro's current replacement criteria.

5.1.2 Pace Advancement

Hydro's historical experience with this program has not demonstrated a need to accelerate the replacement of personal computer devices. Hydro's current lifecycle replacement of these assets ensures performance and security needs are met without unnecessary increases to cost.

5.1.3 Continuation of Program at Current Pace

Under this alternative, computers identified as being deployed and in service for over five years (for mobile laptop computers) and over six years (for desktop/workstation) will be replaced throughout 2027, following Hydro's established replacement criteria to maintain adequate service levels for business continuity and ensure electronic business data is secure.

5.2 Least-Cost Evaluation

Hydro has not identified any viable alternatives to facilitate a least-cost evaluation.

5.3 Recommended Alternative

Hydro recommends the replacement of computer infrastructure that has been in service for more than five to six years, based on the equipment type and associated replacement lifecycle.

5.3.1 Risk of Asset Stranding

There is minimal risk for asset stranding as these computers will be used to replace computers currently in use, which have reached the end of their useful life. If a user leaves the organization and their computer has not reached the maximum age or lifespan, it will be reimaged and redeployed.

5.3.2 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027 program in accordance with Hydro's Capital Risk Assessment process, as outlined in Section 7.0 of Schedule 1. The outcome of this assessment is provided in Table 1.

Table 1 : Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	3	3	**9**
Post-Implementation	3	1	**3**
		Risk Mitigated	**6**
		Risk Mitigated per $1 Million	**3.6**

6.0 Scope of Work

A preliminary analysis based on existing device age has identified a projected 275 personal computers due for replacement in 2027. Hydro is proposing to purchase an additional 22 computers, which will be used as replacements for unexpected failures, breakage, and loss.

A reassessment of equipment to be replaced will occur in January 2027, as the proposed quantities are a forecast based upon lifecycle retirements and the number of new units required to accommodate new software applications or work methods.

6.1 Program Budget

The estimate for this program is shown in Table 2. The personal computing devices purchased for Hydro's regulated business segment represent approximately 80% of the budget, and corporate assets represent approximately 20%.

Table 2: Program Estimate ($000)

Program Cost	**2027**	**2028**	**Beyond**	**Total**
Material Supply	1,190.6	0.0	0.0	**1,190.6**
Labour	55.8	0.0	0.0	**55.8**
Consultant	83.4	0.0	0.0	**83.4**
Contract Work	0.0	0.0	0.0	**0.0**
Other Direct Costs	2.5	0.0	0.0	**2.5**
Interest and Escalation	50.8	0.0	0.0	**50.8**
Contingency	266.5	0.0	0.0	**266.5**
Total	**1,649.6**	**0.0**	**0.0**	**1,649.6**

Chart 4 provides the five-year historical program expenditures, the proposed 2027 program budget, and the forecast budget for the next five years. As outlined in Section 2.0, the scope of IS assets within this program expanded beginning in 2025 as a result of amalgamation. Higher program costs in 2027 are associated with the increased number of rugged devices and workstations due for replacement in that year; these assets carry a higher cost per unit.

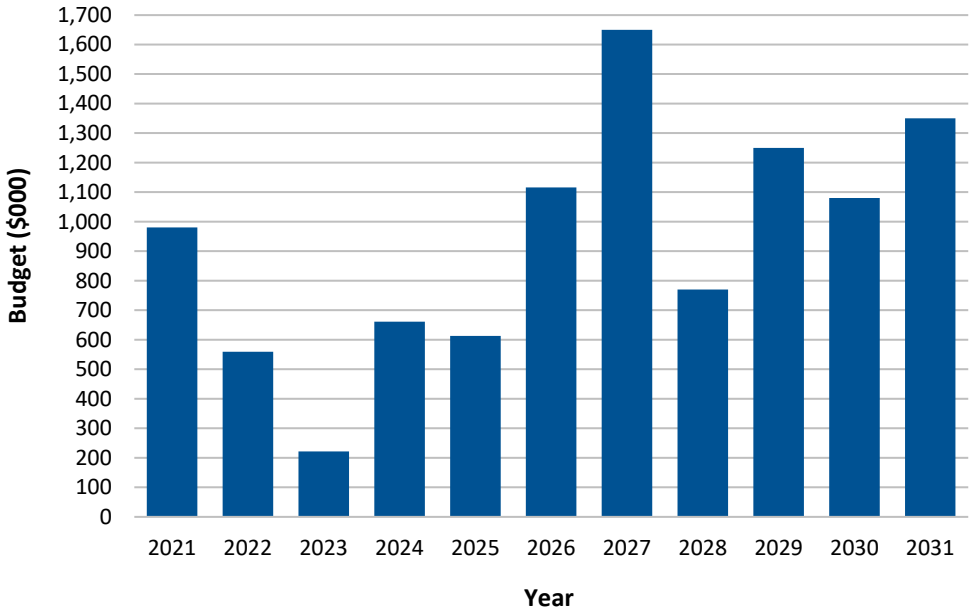


Chart 4: Historical and Forecast Program Budget[7]

[7] Supra, f.n. 4.

6.2 Program Schedule

The schedule for the program is shown in Table 3.

Table 3: Program Schedule

Activity	Start Date	End Date
Planning:		
Open the project and review the scope.	February 2027	February 2027
Design:		
Prepare baseline machine configuration.	February 2027	March 2027
Procurement:[8]		
Order/receive equipment.	February 2027	October 2027
Construction:		
Deploy.	May 2027	October 2027
Closeout:		
Project closeout.	November 2027	November 2027

7.0 Conclusion

This program proposes to replace personal computing devices and accessories approaching end-of-life following Hydro's established replacement criteria. Under this program, computers identified as being deployed and in service for over five years (for mobile laptops) and over six years (for desktop and workstation computers) will be replaced throughout 2027, following Hydro's established replacement criteria to maintain adequate service-levels for business continuity and ensure electronic business data is secure.

[8] The Request for Proposal process is not included in the capital budget as it is considered an operating cost.

Replace Disconnects

(2027–2029)

newfoundland labrador hydro

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Appendix A: Replace Disconnect Program – 2027–2031 Plan

Replace Disconnects (2027–2029)

Location: Various

Investment Classification: Renewal

Asset Category: Terminal Stations

Estimated Cost: $1,576,900

1.0 Introduction

High voltage disconnect switches ("disconnect switches") are used as a means of electrically isolating equipment within a terminal station or as a means of bypassing equipment to maintain service during maintenance activities. Disconnect switches are an important part of the Work Protection Code,[1] as they provide utility workers with a visible air gap (i.e., visible isolation). Proper operation of disconnect switches is essential for a safe work environment and terminal station reliability.

2.0 Program Description and Justification

All the disconnect switches planned for replacement in the Replace Disconnects (2027–2029) Program are currently in service. As a result of increased equipment lead times, the work will be executed over three years instead of two, as is the case for the 2026–2028 Replace Disconnects Program.

As detailed in the Terminal Station Asset Management Strategy,[2] disconnect switches that meet any of the following criteria are eligible for replacement and are typically planned for replacement within five years of eligibility:

- Replacement parts are unavailable due to obsolescence, damage beyond repair, or cost-prohibitive repair, and no immediate replacement is required due to failure; or
- Operating deficiencies and reached a service life of:
  - 50 years if insulators and live parts are original;
  - 60 years if insulators or live parts (but not both) are original;
  - 65 years of age if neither insulators nor live parts are original;

[1] This system is used to produce the necessary documentation to isolate pieces of equipment that require maintenance safely.
[2] Provided as Appendix F to Schedule 1 of this application.

- Reached a service life of:
  - 60 years if its insulators and live parts are original;
  - 70 years if its insulators and/or or live parts are not original.

3.0 Program Replacement Strategy

In Board of Commissioners of Public Utilities ("Board") Order No. P.U. 2(2026) , the Board noted:

> Under the Replace Disconnects program, Hydro advised that at the current pace of the program, the oldest of its disconnects will be 68 years of age at the time of replacement, which is beyond the anticipated 60 year service life. Hydro noted that it plans to update its terminal station asset management strategy to state that disconnects at age 60 are eligible for replacement, but are not necessarily planned for replacement at age 60. The Board has concerns with Hydro changing its strategy for replacing disconnects without providing further evidence regarding the appropriate replacement age. The Board requires that Hydro include a review of the Replace Disconnect program in its next Capital Budget Application to ensure that the pace and age of replacement of the assets is appropriate.[3]

As part of Newfoundland and Labrador Hydro's ("Hydro") 2026 Capital Budget Application ("CBA")proceeding, in response to PUB-NLH-062, Hydro indicated that it plans to update its Terminal Station Asset Management Strategy to clarify the disconnect replacement strategy. Specifically, the revised wording states that disconnects become eligible for replacement at age 60, but are not necessarily planned for replacement at that age.

Hydro's intent was to clarify the replacement criteria, as the original wording could be interpreted to mean disconnects were replaced upon reaching 60 years of age, regardless of condition. In practice, reaching 60 years of age makes a disconnect eligible for replacement consideration, with the timing of replacement determined by other factors, including asset condition and availability of replacement parts.

Hydro monitors the condition of its switches by conducting regular visual inspections of the units and reviewing reports completed by field staff who operate these switches. These reports document operational issues encountered during operation of a switch, and include information such as inoperable mechanical linkages, misalignment of switch blades, broken insulators, and the seizing of moving parts. While Hydro's Terminal Station Asset Management Strategy identifies a service life of a disconnect

[3] Board Order No. P.U. 2(2026), p.10-11/34-5.

switch to be approximately 60 years, disconnect switches are evaluated based on asset condition and ability to repair.

Based on routine inspections and ongoing maintenance activities, Hydro has demonstrated that disconnect switches can continue to operate reliably beyond their nominal 60-year service life. Hydro notes that it has not changed its strategy with regards to disconnect replacement, and has updated the wording within its strategy for clarity.

4.0 Asset Overview

4.1 Asset Background

Under this program, ten disconnect switches require replacement, as they meet the applicable replacement criteria. All disconnect switches planned for replacement in this program are currently in service. These units will be between 32 and 64 years of age at the scheduled time of replacement. A number the units have experienced operational deficiencies or have become obsolete, creating concerns for parts availability.

4.2 Asset Condition

Hydro monitors the condition of disconnect switches by conducting regular visual and infrared inspections to determine the existence of hot spots. Reports from station personnel also identify issues such as mechanical problems and broken insulators.

4.3 Condition-Based Remaining Life

Disconnect switches that experience failures are repaired as part of ongoing maintenance activities, if feasible, provided that required parts are available. Disconnect switches that have operating deficiencies and have reached the end of their service life, or have become obsolete, are replaced under this program.

4.4 Asset Ages

Chart 1 provides the age for all assets covered under the program.

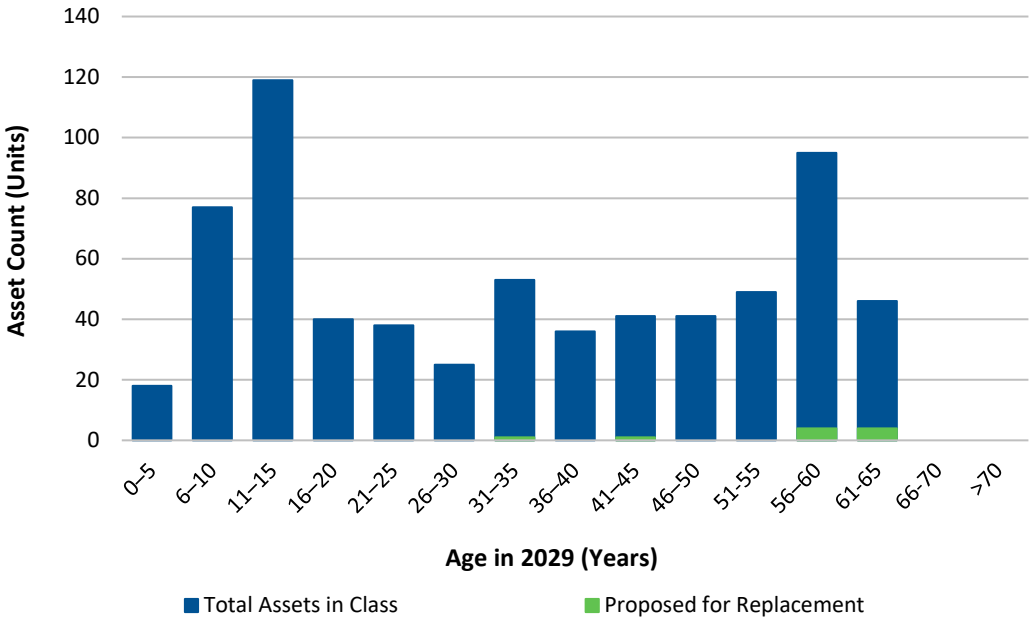


Chart 1: Asset Counts by Asset Age

5.0 Trending

5.1 Assets Installed/Replaced/Upgraded

Chart 2 provides the five-year historical, current, and the five-year forecast number of assets replaced per year. The number of disconnect switches requiring replacement will vary as switches reach the end of their service life and as deficiencies are identified. As such, the quantity of disconnect switches replaced per year varies.

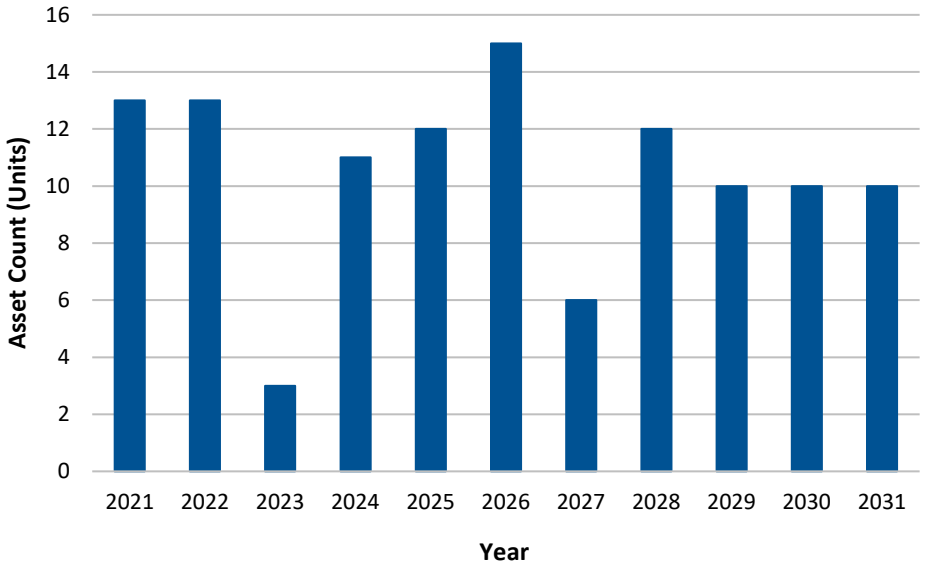


Chart 2: Historical and Forecast Number of Assets Replaced[4]

5.2 Historical and Forecast Average Unit Costs

Chart 3 provides the five-year historical, current, and five-year forecast average unit cost of asset replacement in each year. The number and type of disconnect switches requiring replacement will vary as switches reach the end of their service life and as deficiencies or obsolescence are identified. As such, the average cost per unit varies.

[4] Due to longer-than-anticipated delivery timelines, 2023 saw a decrease in the number of disconnect switches replaced compared to the number originally approved in Hydro's 2023 CBA in Board Order No. P.U. 2(2023). These switches were deferred to subsequent years.

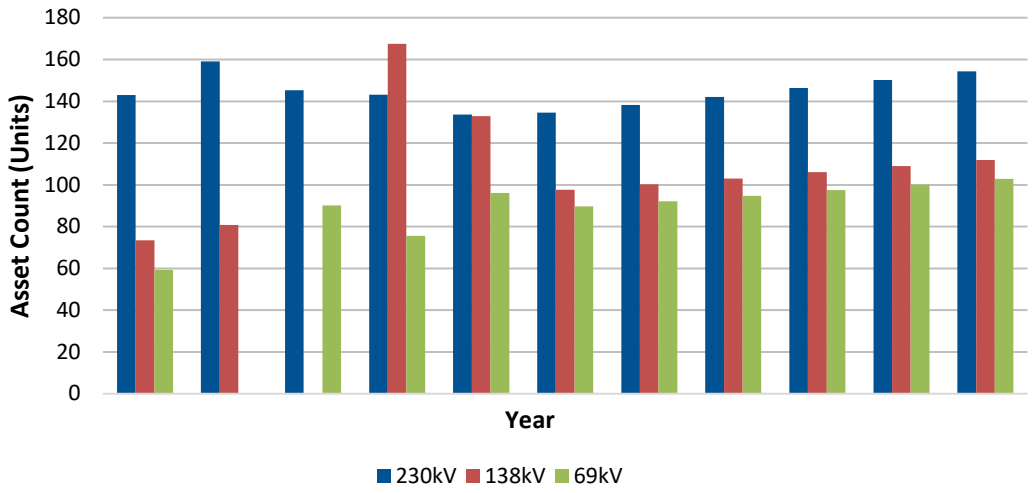


Chart 3: Historical and Forecast Average Unit Costs of Assets Replaced[5,6]

5.3 Historical Reliability

Hydro does not currently record disconnect switch outage statistics; therefore, historical reliability data for the assets covered within this program is not available.

6.0 Analysis

6.1 Evaluation of Alternatives

For the assets recommended for replacement within this program, the following alternatives were considered:

- Pace reduction;
- Pace advancement; and
- Continue program at current pace.

6.1.1 Pace Reduction

Reducing the overall pace of replacement for the disconnect switches identified in the current program would extend the in-service time of these units past Hydro's identified replacement criteria and increase

[5] Values for 2026 to 2031 are inflated from 2025. .
[6] In 2024, two of the four 138 kV switches replaced included a ground switch, which is substantially higher cost than a typical 138 kV disconnect switch. Of the four switches replaced, one included a capacitor bank ground switch which is also substantially higher cost than a typical 138 kV switch.

the risk of in-service failures. This would present an increased risk to terminal station reliability and threatens the safe working environment. As such, pace reduction is not considered a viable alternative at this time.

6.1.2 Pace Advancement

Hydro has developed the replacement program considering system criticality, ability to execute, and outage constraints. While the number of disconnect switches over 60 years of age is increasing, routine inspections and ongoing maintenance activities continue to support their safe and reliable operation. As such, Hydro does not consider an accelerated replacement pace to be necessary at this time.

6.1.3 Continuation of Program at Current Pace

Proceeding with the identified upgrades ensures the assets identified as candidates for capital intervention in this proposal would be replaced or refurbished in a timely manner, as per Hydro's established practices, providing sufficient time to ensure least-cost procurement and installation.

6.2 Least-Cost Evaluation

Hydro has not identified any viable alternatives to facilitate a least-cost evaluation.

6.3 Recommended Alternative

Hydro recommends the replacement of the identified disconnect switches at the current pace to minimize the potential of in-service failures at the affected operational sites.

6.3.1 Risk of Asset Stranding

Hydro has no plans to retire the stations identified within this program from service; therefore, the risk of asset stranding is low.

6.3.2 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027–2029 program in accordance with Hydro's Capital Risk Assessment process, as outlined in Section 7.0 of Schedule 1. The outcome of this assessment is provided in Table 1.

Table 1: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	4	3	**12**
Post-Implementation	4	1	**4**
		Risk Mitigated	**8**
		Risk Mitigated per $1 Million	**5.1**

7.0 Scope of Work

Hydro's five-year plan for the Replace Disconnects Program is provided in Appendix A. Based on current condition and asset data, Hydro proposes the replacement of disconnect switches that meet Hydro's established eligibility criteria as outlined in its Terminal Station Asset Management Strategy. The scope of this program includes engineering design, procurement, installation, and commissioning of disconnect switches. All units are planned for replacement before the end of 2029. Based on asset condition and outage and resource availability at the time of execution, Hydro may advance or defer the replacement of specific assets to ensure efficient and effective implementation of this program.

7.1 Program Budget

The estimate for this program is shown in Table 2.

Table 2: Program Estimate ($000)[7]

Program Cost	**2027**	**2028**	**Beyond**	**Total**
Material Supply	0.0	576.5	45.0	**621.5**
Labour	91.0	105.5	392.8	**589.3**
Consultant	29.7	26.5	25.2	**81.5**
Contract Work	0.0	0.0	13.0	**13.0**
Other Direct Costs	1.7	1.7	19.9	**23.2**
Interest and Escalation	5.5	53.8	56.4	**115.7**
Contingency	12.2	71.0	49.6	**132.8**
Total	**140.1**	**834.9**	**601.9**	**1,576.9**

[7] Numbers may not add due to rounding.

Chart 4 provides the five-year historical program expenditures, the forecast 2026 expenditures, the proposed 2027–2029 budget and the forecast costs through 2031. Variability in budgets can be attributed to the quantity and voltage class of disconnects to be replaced in a given year.

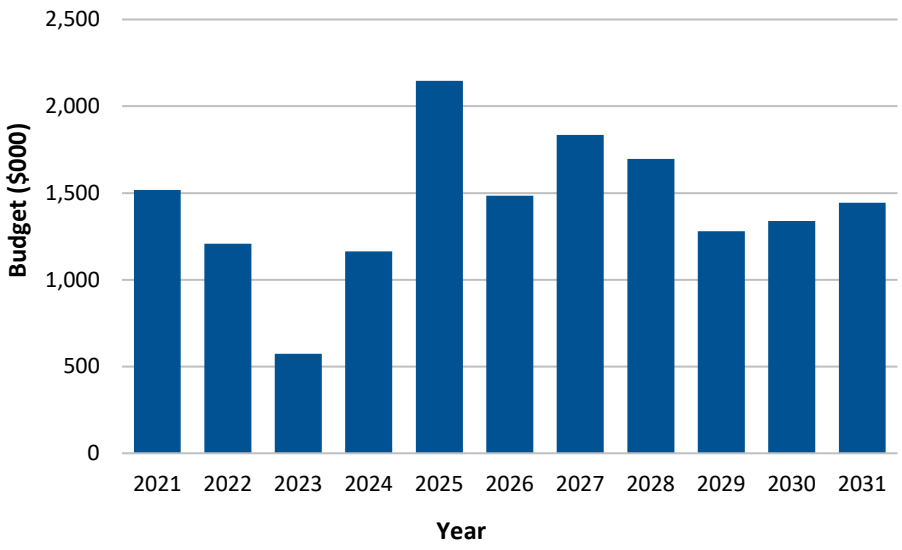


Chart 4: Historical and Forecast Program Budget

7.2 Program Schedule

The schedule for the 2027–2029 program is shown in Table 3.

Table 3: Program Schedule

Activity	Start Date	End Date
Planning:		
Initial planning and scheduling.	January 2027	February 2027
Procurement:		
Conduct site visits, develop disconnect tender package.	February 2027	April 2027
Tender and award.	May 2027	June 2027
Engineering Design:		
Complete detailed design.	February 2028	November 2028
Procurement of Parts:		
Order miscellaneous materials.	March 2028	November 2028
Construction:		
Replace disconnect switches.	April 2029	October 2029
Commissioning:		
Commission new disconnect switches.	April 2029	October 2029
Closeout:		
Complete closeout documentation.	November 2028	December 2029

8.0 Conclusion

Under the Replace Disconnects 2027–2029 program, ten disconnect switches require replacement, as they meet the applicable replacement criteria as outlined in the Terminal Station Asset Management Strategy.

Appendix A

Replace Disconnects Program

2027–2031 Plan





Assets planned for replacement from 2027–2031 under the Replace Disconnects Program are provided in Table A-1 to Table A-5.

Table A-1: Asset Planned for Replacement in 2027[8]

Name	Voltage (kV)
Doyles L14AG	138
Doyles L14T1 c/w ground switch	138
Doyles B1T1-1	69
Holyrood B7L2-2 c/w ground switch	69
Holyrood B7L38-1	69
Parson's Pond L27-1 c/w ground switch	69

Table A-2: Assets Planned for Replacement in 2028[8]

Name	Voltage (kV)
Holyrood B15T6	230
Holyrood B8T8	138
Holyrood B8T6	138
Happy Valley B13L03-1	138
Happy Valley B13L03-2 c/w ground switch	138
Massey Drive B1T1	230
Sunnyside L02L07-2	230
Stony Brook B1L35-1	230
Stony Brook B1L31-1	230
Stony Brook B1L31-2 c/w ground switch	230
Churchill Falls 24L24 c/w ground switch	230
Wabush B1L24-1	230

Table A-3: Assets Planned for Replacement in 2029

Name	Voltage (kV)
Bay D'Espoir B1B10-1	230
Bay D'Espoir B2B3-1	230
Bay D'Espoir B4B5-2	230
Bay D'Espoir B5L04 c/w ground switch	230
Holyrood B15T7	230
Holyrood B8T7	138
Massey Drive B1B5	230
Western Avalon L01L03-2 c/w ground switch	230
Western Avalon L01L03-1 c/w ground switch	230
Western Avalon L03L17-1	230

[8] Included in the 2026 Capital Budget Application Replace Disconnects 2026–2028 Proposal.

Table A-4: Assets Planned for Replacement in 2030

Name	Voltage (kV)
Holyrood B7L2-1	69
Bay D'Espoir B4L02 c/w ground switch	230
Massey Drive B3L357-1	69
Massey Drive B3L351-1	69
Oxen Pond B2SSVT1	69
South Brook L22-1 c/w ground switch	138
Sunnyside B2B3	138
Sunnyside B3L19-2 c/w ground switch	138
Stony Brook B2T2	230
Come by Chance B2AG	230

Table A-5: Assets to be Replaced in 2031

Name	Voltage (kV)
Howley B1L24-2 c/w ground switch	138
Holyrood B6B7	69
Rocky Harbour Tap TL226 RTL26-1	66
Rocky Harbour Tap TL226 RTL26-2	66
Rocky Harbour Tap TL226 RTL26-3	66
Rocky Harbour Tap TL226 RTL26G1	66
Rocky Harbour Tap TL226 RTL26G2	66
Western Avalon B1L17-2 c/w ground switch	230
Western Avalon B1L17-1	230
South East Hill L26 c/w ground switch	69

Replace Light-Duty Mobile Equipment

(2027)



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Replace Light-Duty Mobile Equipment (2027)

Location: Various

Investment Classification: General Plant

Asset Category: Tools and Equipment

Estimated Cost: $1,542,000

1.0 Introduction

Newfoundland and Labrador Hydro ("Hydro") operates a fleet of mobile equipment comprised of 319 light-duty assets. These assets include snowmobiles, all-terrain vehicles ("ATVs"), trailers, and forklifts.

Hydro employees work throughout the province, including many locations that require alternative modes of transportation. As such, Hydro's staff requires reliable mobile equipment to effectively fulfill their duties. The fleet is utilized daily to support staff engaged in the operation and maintenance of the electrical system.

Under this program, Hydro is proposing the replacement of light-duty mobile assets in accordance with its replacement criteria.

2.0 Program Description and Justification

Hydro operates its fleet of light-duty mobile equipment[1] as required to maintain the safety and reliability of the electrical system. Hydro's mobile equipment fleet is strategically distributed across Hydro's operating areas throughout the province. As equipment ages, it experiences increased downtime that could negatively impact emergency outage response times or planned maintenance.

Hydro's key replacement criteria for light-duty mobile equipment are provided in Table 1.

[1] The scope of this program includes light-duty equipment, such as trailers (both over and under 4,500 kilograms (kg), ATVs/smaller off-road vehicles, forklifts, and snowmobiles.

Table 1: Hydro's Replacement Criteria for Mobile Equipment

Equipment	Replacement Criteria (Age)
Snowmobiles	8
ATVs	7
Trailers <4,500 kg	9
Trailers >4,500 kg	18

In addition to age, Hydro considers the equipment's condition before its replacement, as usage of mobile equipment will vary considerably, resulting in retention and continued use of some assets well beyond the average age criteria. Miscellaneous equipment, such as forklifts, boats, etc., have no formally defined replacement criteria. In these cases, replacement is based on equipment condition, age, and availability of spare parts and service.

Historically, the replacement of heavy-duty mobile equipment, such as heavy-duty track machines, excavators and maintenance equipment, was included within this program scope. In Board of Commissioners of Public Utilities ("Board") Order No. P.U. 28(2024), approving Hydro's 2025 Capital Budget Application ("CBA"), the Board had noted concerns with including scopes of light- and heavy-duty mobile equipment in the same program, stating:

> The Board finds that Hydro has not provided sufficient justification for the combining of light- and heavy-duty vehicles/assets. While there may be some efficiencies gained in grouping the different types of vehicles/assets together, the Board finds that separation will allow for greater transparency, clarity, and better reflect delivery time and cost.[2]

Upon further review of the program scopes and consideration of the Board's request, Hydro has separated light- and heavy-duty mobile equipment into separate proposals beginning in the 2026 CBA.

[2] Board Order No. P.U. 28(2024), p. 7/19–22.

3.0 Asset Overview

3.1 Asset Background

Hydro's fleet of mobile equipment is essential to performing planned and unplanned work on critical transmission and distribution systems, in particular the extensive off-road sections that cannot be reached or serviced by the regular highway-driven fleet of light-duty and heavy-duty vehicles.

3.2 Asset Condition

As equipment ages, it experiences increased downtime that could negatively impact emergency outage response times or planned maintenance. In many cases, light-duty mobile equipment is regularly operated under rough conditions and is subject to accelerated wear and tear.

Mobile equipment is inspected in accordance with the preventive maintenance schedule, and all maintenance and repairs are performed by Hydro or third-party service providers, as needed. This helps to ensure that the maximum potential reliable service life is achieved.

3.3 Condition-Based Remaining Life

Hydro evaluates assets as they near the retirement criteria to determine if it is appropriate to extend the life of the assets or replace them. This could include reassignment to an area where less or different usage is expected to occur, or where the equipment will be operated in less severe conditions. Hydro has found it appropriate to maintain some mobile assets beyond the average replacement age, as those units are both in adequate condition, and the risk of failure is considered to be a manageable. For other assets, failure risk is much less tolerable, and a fixed lifecycle period is more prudent.

3.4 Asset Ages

Chart 1 provides the aggregate asset age and count for all light-duty mobile equipment types. As replacement criteria vary between asset types, the quantity of replacement units in various age groups is appropriate.

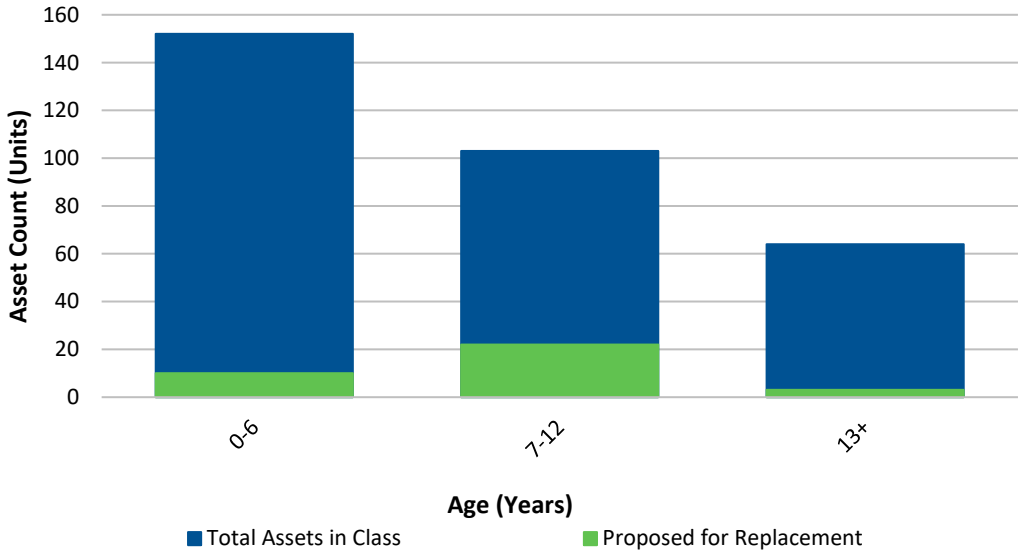


Chart 1: Asset Counts by Asset Age

4.0 Trending

4.1 Assets Installed/Replaced/Upgraded

Chart 2 provides the five-year historical, current, and five-year forecast numbers of aggregated light-duty mobile equipment replaced under this program. The number of assets replaced in 2021 was below average due to global supply chain challenges. The number of replacements in 2026 was higher than average, primarily due to to vehicles ordered in 2025 not being delivered until 2026 as a result of order timing. The replacement scope for 2027 is estimated to include eight trailers, 14 snowmobiles, 11 ATVs, one Argo, and one forklift for a total of 35 units.

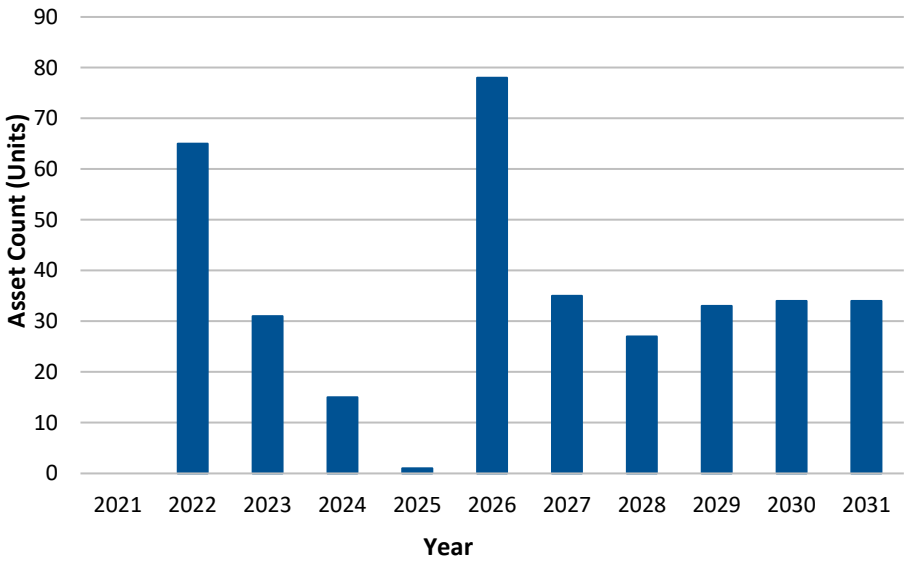


Chart 2: Historical and Forecast Number of Assets Installed/Replaced/Upgraded

4.2 Historical Reliability

Light-duty mobile equipment is inspected in accordance with the preventive maintenance schedule. All maintenance and repairs are performed by Hydro or third-party service providers, as needed.

5.0 Analysis

5.1 Evaluation of Alternatives

Hydro considered the following alternatives:

- Pace Reduction;
- Pace Advancement;
- Continue Program at Current Pace; and
- Alternative Strategies.

5.1.1 Pace Reduction

Hydro's annual long-term asset planning review incorporates asset condition and risk review that permits the lifecycle extension of some units. Unplanned pace reduction imposed by supply chain constraints from 2020 to present confirmed an increased rate of equipment failure that has resulted in challenges to completing required work. The increased rate of failure among aging equipment whose

replacement has been delayed has validated that the current planning criteria and review methodology are near optimal. Further pace reduction is not considered a viable option.

5.1.2 Pace Advancement

Advancing the pace of this program would result in the premature retirement of existing, functional assets, requiring a level of investment which is in excess of the costs required for the delivery of safe, reliable, least-cost power, in an environmentally responsible manner. For this reason, pace advancement is not considered a viable option.

5.1.3 Continuation of Program at Current Pace

Hydro has determined the current replacement criteria are appropriate based on industry standards and consulation with other utilities, the condition of the units upon replacement, and vehicle usage statistics. This approach allows Hydro to balance cost with the reliability of its mobile equipment fleet. The mobile equipment is required to facilitate required maintenance and timely response to system events and, as such, is required to be available and in appropriate, reliable working condition.

5.1.4 Alternative Strategies

Many of the light-duty mobile equipment assets Hydro depends on, such as ATVs, snowmobiles and trailers, are support vehicles used to transport personnel and material to remote locations when needed. To ensure that Hydro will have the right equipment to maintain its system, Hydro does not consider there to be any viable alternative for this program.

5.2 Least-Cost Evaluation

Hydro has not identified any viable alternatives to facilitate a least-cost evaluation.

5.3 Recommended Alternative

Hydro's recommended alternative is to continue the program at the current pace and proceed with the identified replacements based on its replacement criteria. Replacement of mobile equipment, based on Hydro's replacement age criteria along with asset condition, is necessary to ensure the safe and reliable operation of mobile equipment, which is required to safely and reliably operate Hydro's electrical system.

5.3.1 Risk of Asset Stranding

This program is necessary to maintain a safe and reliable mobile equipment fleet. Failure to replace this equipment will lead to increased maintenance costs, less reliable equipment, delays in scheduled and unscheduled work and possible safety risks for operators. Hydro does not foresee any changes in its requirements for mobile equipment; therefore, the risk of asset stranding is low.

5.3.2 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027 program in accordance with Hydro's Capital Risk Assessment process, as outlined in Section 7.0 of Schedule 1. The outcome of this assessment is provided in Table 2.

Table 2: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	3	4	**12**
Post-Implementation	3	1	**3**
		Risk Mitigated	**9**
		Risk Mitigated per $1 Million	**5.8**

6.0 Scope of Work

The 2027 program proposes the replacement of 35 light-duty assets (eight trailers, 14 snowmobiles, 11 ATVs, one Argo, and one forklift) in accordance with Hydro's replacement criteria. Deliveries of all light-duty assets are anticipated in 2027. This program also includes $100,000 in 2027 to address in-service failures for mobile equipment. Hydro will evaluate the cost of repair or refurbishment versus replacement prior to executing in-service failure repairs.

6.1 Program Budget

The estimate for this program is shown in Table 3.

Table 3: Program Estimate ($000)

Program Cost	2027	2028	Beyond	Total
Material Supply	1,238.0	0.0	0.0	**1,238.0**
Labour	12.8	0.0	0.0	**12.8**
Consultant	0.0	0.0	0.0	**0.0**
Contract Work	0.0	0.0	0.0	**0.0**
Other Direct Costs	0.0	0.0	0.0	**0.0**
Interest and Escalation	42.3	0.0	0.0	**42.3**
Contingency	248.9	0.0	0.0	**248.9**
Total	**1,542.0**	**0.0**	**0.0**	**1,542.0**

Recent implementation and adjustments of tariffs on this type of equipment, as well as the cost of components and materials used to fabricate the equipment, have increased uncertainty and volatility in the unit price of these assets. To mitigate these uncertainties, Hydro has increased the amount of contingency to approximately 20%. The contingency budget for the purchase of light-duty mobile equipment includes approximately 10% to accommodate potential price increases relating to various market factors. As price effects relating to tariffs become more apparent, and in cases where tariffs are adjusted in the future, Hydro will reevaluate the amount of contingency included in future mobile equipment replacement proposal budgets.

Chart 3 shows the five-year historical expenditures, the forecast 2026 expenditures, the proposed 2027 program budget, and the forecast budget through 2031. The underspend in 2025 and spike in 2026 can be attributed to delayed receipt of budgeted vehicles for 2025.

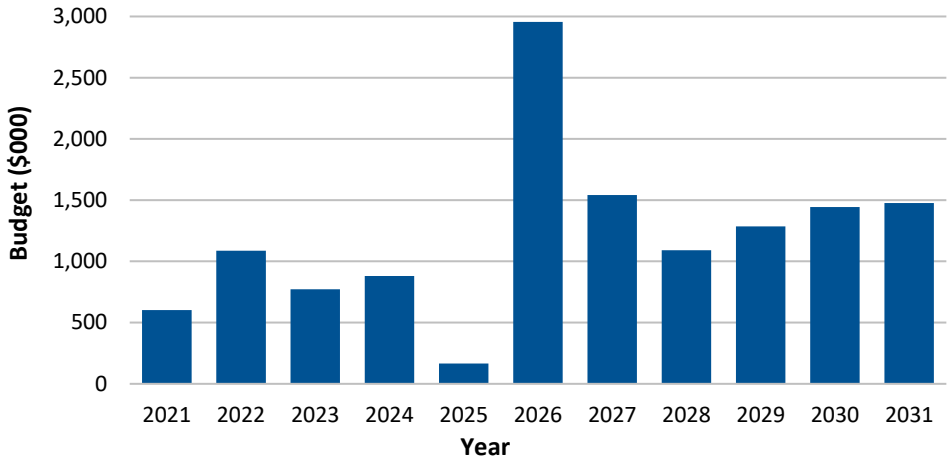


Chart 3: Historical and Forecast Program Budget

Light-duty mobile equipment will be requisitioned and received in 2027.

6.2 Program Schedule

The schedule for this program is shown in Table 4.

Table 4: Program Schedule

Activity	Start Date	End Date
Planning:		
Open work orders, plan, and develop detailed schedules.	February 2027	March 2027
Procurement:		
Tender and award contracts.	February 2027	May 2027
Receive and commission short-lead equipment.	July 2027	November 2027
Closeout:		
Close work orders, complete all documentation, and complete lessons learned.	December 2027	December 2027

7.0 Conclusion

Hydro operates a fleet of light-duty mobile equipment to enable the effective maintenance of the electrical system and timely response to system events.

Failure to replace the mobile equipment will lead to increased maintenance costs, less reliable equipment, and safety concerns for all users. The established replacement criteria have been determined to be appropriate. Hydro proposes to continue with the replacement of light-duty mobile equipment under this program for 2027.

Perform Facilities Refurbishments

(2027)



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Appendix G: Facilities Management Jurisdictional Scan

Perform Facilities Refurbishments (2027)

Location: Various

Investment Classification: General Plant

Asset Category: Properties

Estimated Cost: $1,470,200

1.0 Introduction

Newfoundland and Labrador Hydro ("Hydro") owns, operates and maintains 342 buildings, which contain approximately one million gross square feet of usable space.

These facilities play a critical role in supporting the operation of Hydro's generation, transmission, and distribution systems. Hydro aims to refurbish its facilities assets to restore their condition, ensure adherence to regulatory requirements, and extend their service life.

To achieve this, Hydro proposed a new annual capital program as part of its 2026 Capital Budget Application ("CBA") to refurbish its building class of assets as they reach the end of their design life or require attention due to obsolescence or anticipated failure.[1] This program will consolidate its facility refurbishment projects, each of which carries an estimated value of less than the legislative threshold of $750,000, into the Perform Facilities Refurbishments program.[2] This approach will promote proactive planning of capital investments in Hydro's facilities.

Historically, Hydro has submitted either individual projects for particular assets, or programs for sustaining work related to its facilities assets in its CBA, resulting in a segmented view of the expenditures to sustain these assets.[3] Combining these projects into the Perform Facilities Refurbishments program allows the opportunity to increase regulatory efficiency and provide a more focused, transparent presentation of Hydro's sustaining efforts for facilities assets. The refurbishment

[1] In Board of Commissioners of Public Utilities ("Board") Order No. P.U. 2(2026), the Board approved Hydro's proposed expenditures of $3,027,900 for the Perform Facilities Refurbishment program in Hydro's 2026 CBA.
[2] Individual refurbishment scopes of work with an estimated value of greater than $750,000 will continue to be filed as a stand-alone project. Hydro notes that its Modify Office Buildings and Procure Furniture, Fixtures, and Equipment program will continue as a stand-alone program to address office retrofits driven by changes in the organizational structure and unforeseen requests to accommodate departmental or individual employee needs.
[3] For example, there were 53 projects in the period 2020–2024 delivering 135 new assets, with investment classifications under mandatory or general plant.

scope included in this program is selected utilizing Hydro's Enterprise Risk Management – Risk Rating, in conjunction with risk spend efficiency (risk mitigated per million dollars).[4] Following this approach, work is prioritized by assigning an overall risk rating to each item, ensuring that high-risk items are addressed first. After targeting high-risk items, risk spend efficiency is considered for all medium-risk items, thus enabling the scope of medium-risk refurbishment work to be prioritized or selected to capitalize on opportunities based on maximum value. This helps Hydro avail of execution efficiencies and maximizes risk reduction. All work scopes are selected with the ability to execute within the proposed program budget.[5]

For the 2027 CBA, work scopes and asset condition were primarily derived from existing assessments, which have been completed on a select number of facilities and provided as Appendices B through F.[6] As part of its initiative to continually improve its asset management strategy for facilities, Hydro intends to complete condition assessments for its remaining facilities and utilize this information to further develop the scope of this program for future applications.

As requested by the Board in Board Order No. P.U. 2(2026), Hydro conducted a review on the methodology for estimating capital expenditures for facilities refurbishment. Hydro completed a jurisdictional scan of other Canadian utilities facilities management practices, with responses received from seven utilities.[7] Generally, responses received indicated that the other utilities approached facilities management and capital planning and estimating similarly to Hydro. The majority of respondents indicated they prioritize facility refurbishment based on safety and asset condition rankings. One utility noted their refurbishment projects are evaluated against established criteria to compete for a limited capital investment envelope. For detailed responses from the survey respondents in full, please refer to Appendix G of this report.

In the 2026 iteration of this program, Hydro imposed a budget envelope to efficiently address the high quantity of low-materiality scopes. Based on the more defined scopes within the 2027 iteration of the program, and for alignment with the results of Hydro's jurisdictional scan, Hydro has utilized its

[4] Hydro provides the assessed risk rankings for each item identified within the project scope in Appendix A.
[5] A complete listing of the currently identified work scopes and their proposed execution year is attached as Appendix A.
[6] Condition assessments have been completed for the following assets with scope included in this 2027 program: Hydro Place; Ramea Diesel Generating Station Powerhouse; Stephenville Main Office Building, Garage, and Warehouse; Bishop's Falls Office/Warehouse Building; and Whitbourne Carpentry Shop, Depot/Office Building, and Garage.
[7] Response from an eighth utility was omitted from the survey results as they maintain no buildings and solely lease.

traditional estimating methodology, which includes detailed estimation of each scope proposed within the program.

2.0 Program Description and Justification

Hydro's facilities house employees, tools, and critical equipment that support its generation and transmission operations. It is imperative that these facilities receive the necessary investment required to maintain occupant health and safety and extend their service life. The proposed program will promote enhanced facilities management oversight, thus ensuring that the built environment adequately supports the company's core activities.

Assets which are altered or modified (modernization) for building code statutory compliance or energy efficiency and sustainability reasons, and replaced or refurbished under this program, are critical building systems which have been identified as posing a risk to reliability, safety, or the environment. Replacement or refurbishment is required to improve the assets' condition, ensure adherence to regulatory requirements and extend the service life of Hydro's facilities. Unless otherwise stated, there are no viable alternatives for the proposed refurbishment work designated within this program, as continued deferral of this work could result in a reduced service life and/or place the facility's ability to remain operational at risk. Replacement of various equipment/components within the building will only be pursued if those respective components have exceeded their service life and corrective maintenance is no longer an option.

The assets designated for replacement, refurbishment, or modernization herein have been selected to improve occupant health and safety, loss prevention, and renewal to extend the service life of a facility.

The facility components subject to refurbishment under this program have been divided into four categories (Uniformat II Level 1 – Major Group Elements), derived from the Uniformat II Classification System,[8] and include the substructure, shell, interiors, and services.

2.1 Substructure

Substructure includes all work below the lowest floor construction and the enclosing horizontal and vertical elements required to form a basement, together with the necessary mass excavation backfill.

[8] Uniformat II is a standard classification system for building elements and related site work. It provides a consistent means for categorizing building components.

Typical work consists of foundation construction/repairs, perimeter drainage installation/replacement, basement wall construction, installation of moisture protection systems, and installation of insulation, etc.

2.2 Shell

This system includes elements of the building superstructure, consisting of structural slabs, columns, beams, structural walls, and the building's exterior envelope. Typical work includes, but is not limited to, floor construction, exterior stairways and fire escapes, roof construction, exterior wall construction, and exterior windows and doors.

2.3 Interiors

Interiors include building components inside the exterior walls and enclosure, excluding structural walls. Interiors are comprised of partitions, interior doors, stairs, and finishing systems for walls, ceilings and floors. Typical work consists of partition wall construction, installation and replacement of interior doors, installation and refurbishment of interior stairs and railings, and installation and refurbishment of interior finish materials, such as paint, flooring, and drywall.

2.4 Services

Services include all systems intended for the purpose of conveying, plumbing, electrical, heating, ventilation and air conditioning ("HVAC"), and fire protection. Typical work consists of:

- **Conveying**: Refurbishment of conveyance systems such as elevators.
- **Plumbing**: Installation and/or replacement of plumbing fixtures, domestic water supply equipment, floor drains, and vent piping.
- **Electrical**: Installation and/or replacement of lighting, communication and security systems, fire alarm, and emergency lighting systems.
- **HVAC**: Installation and/or replacement of heat-generating systems, ventilation systems, cooling systems, fume collectors, and associated controls and instrumentation.
- **Fire Protection**: Installation and/or replacement of sprinkler systems, extinguishers, dry chemical fire suppression systems, and other related assets.

3.0 Asset Overview

3.1 Asset Background

Hydro owns and operates 342 buildings, located at 100 sites, across its operations. The majority of these facilities were constructed in the late 1960s and have not undergone any major refurbishment throughout their service life.

For the 2027 CBA, work scopes and asset condition were primarily derived from existing assessments for: Hydro Place; Ramea Diesel Generating Station Powerhouse; Stephenville Main Office Building, Garage, and Warehouse; Bishop's Falls Office/Warehouse Building; and Whitbourne Carpentry Shop, Depot/Office Building, and Garage.

3.2 Asset Condition

3.2.1 Hydro Place

Constructed in 1988, Hydro Place is a six-storey office building which serves as the corporate headquarters for Hydro. At 38 years of age, the building's exterior envelope is reaching the end of its service life and is in need of refurbishment.

Building condition assessments completed in 2018 and 2024[9] have stated that the windows and/or curtain wall systems at Hydro Place are in fair to poor condition. Several areas of the curtain wall frequently leak during wind-driven rain events, resulting in water infiltration, which damages interior finishes and increases the risk of mould formation. These leaks indicate that the exterior and concealed seals have failed.

Additionally, numerous fogged insulating glass units ("IGU") are present throughout the facility.[10] As the glazing systems continue to age, IGU failure, as well as air and moisture leakage, will continue to occur at an accelerated rate.

A $250,000 allowance will be budgeted for 2027 to address the most critical locations where curtain wall issues have been identified in the facade. This will address problematic leaks and provide cost information to enable the proper planning for the refurbishment of the remaining window units. The costs of this program will be allocated to applicable lines of business using Hydro's Intercompany

[9] Provided as Appendix B of this proposal.
[10] An IGU commonly consists of two panes of glass separated by a spacer material and sealed together at the edge.

Transactions Guidelines under a common service Hydro Place administration fee allocated based on square footage. Hydro's regulated business segment will be responsible for approximately 57% of the total cost, the entities related to the Muskrat Falls assets will be responsible for approximately 6% of the cost, and the remaining lines of business will accrue the remainder.

3.2.2 Ramea Diesel Generating Station Powerhouse

The Ramea Diesel Generating Station Powerhouse is a two-storey, on-grade, pre-engineered steel structure which was constructed in 1997. The building consists of a two-storey engine hall containing three gensets, with an adjacent lower-level workshop, switchgear room, washroom and control room. The upper level includes a kitchen and storage area.

The building envelope consists of primary structural steel framing, with horizontal steel girts[11] that connect to the building columns and support the siding. The building has a sloped metal roof supported by steel purlins that connect to the primary steel framing.

The facility has experienced issues with water infiltration and deterioration, primarily on the south wall, which is exposed to prevailing winds and associated ocean spray. Deterioration of the steel girts and door jambs has progressed to the point where these structural members no longer provide sufficient support for the exterior metal siding. Detailed engineering design of proposed refurbishments for the building structure will be completed under this program in 2027, with execution of the refurbishment work to be completed in a future year.

A condition assessment outlining the extent of deterioration has been provided as part of this proposal.[12]

3.2.3 Stephenville Main Office Building, Garage, and Warehouse

The Stephenville main office building is a single-storey, steel-frame building, which was constructed in the early 1940's.[13] The building currently houses Transmission and Rural Operations Administration, staff training, a small warehousing space, and three workshops. The building's domestic water piping consists of a mixture of original and newer piping installed during renovations over the building's history. It is recommended that all remaining original piping be replaced as it has reached the end of its

[11] A girt is a horizontal structural member in a framed wall used to provide lateral support to the wall panel.
[12] Provided as Appendix C of this proposal.
[13] Stephenville buildings were not originally constructed by Hydro; as such, the exact year of construction is unknown.

useful life. Additionally, a hot water tank requires replacement, including modification to the hot water tank enclosure, to ensure code compliance.

The Stephenville garage building is a single-level, on-grade, pre-engineered steel structure with an approximate floor area of 166 m^2. The building features an insulated envelope and a predominantly unfinished interior. The space is configured as a three-bay repair garage, with a service pit located in the center bay. In addition, the building includes seven ancillary rooms which support garage operations.[14] The building is estimated to be 20–25 years old and is currently in good condition.

The Stephenville warehouse is a single-level, on-grade, pre-engineered steel structure of approximately 134 m^2 area that is over 30 years old. The building is subdivided into three rooms separated by metal demising partitioning walls which are used for line crew equipment storage. Two of the rooms are equipped with sectional overhead doors in addition to a single swing steel personnel door; the third room has a pair of steel swing doors. The roof is low-slope gable metal clad, the windows are steel with corroded steel security screening and the personnel doors are metal in pressed steel frames with commercial hardware.

The three Stephenville facilities are generally in good condition; however, several key building components have reached the end of their service life and require replacement. Each of the building's lighting systems consists of fluorescent light fixtures which are approaching obsolescence and require replacement with LED fixtures due to the phasing out of fluorescent lighting technology. Additionally, the condition of the overhead doors in the garage and warehouse buildings indicate replacement is required. The metal warehouse siding requires painting to restore corrosion protection and extend its useful service life.

The proposed refurbishments are required to restore the facilities to the service level to which they were designed, improve occupant health and safety, maximize the service life of the assets, and address code non-compliance issues. A condition assessment is provided as part of this proposal.[15]

[14] Ancillary rooms are primarily masonry construction and include washroom, office, employee break room, parts, storage, and two small ceiling storage lofts.
[15] Provided as Appendix D of this proposal.

3.2.4 Bishop's Falls Office/Warehouse Building

This 3,100 m^2, two-level office/warehouse building was constructed circa 1980. The building is a combination of a pre-engineered metal and conventional steel frame structure, housing a large office wing with staff lunch areas, and a warehouse which supplies Hydro's operations throughout most of the province. The exterior canopy lighting consists of incandescent lighting fixtures to be replaced with energy efficient LED fixtures. The building's second floor and server room split air conditioning units are operational but approaching the end of their useful service lives and require replacement. A condition assessment is provided as part of this proposal.[16]

3.2.5 Whitbourne Carpentry Shop, Depot/Office Building, Garage, and Storage Building

This 800 m^2 depot is a pre-engineered metal building, which was originally constructed circa 1974. A 12 meter extension was added to the warehouse many years later. The building sits atop concrete foundations and houses offices, a training room, staff break rooms, washrooms, a warehouse, and various individual workshop units. The building has pre-formed metal siding and a steel roof. The building is in good condition, but the envelope is exhibiting signs of aging. It is recommended that the roof and metal siding be replaced.

This maintenance garage has a 133 m^2 first-floor area, plus an 18.4 m^2 second floor mezzanine. The facility was constructed in 1982. On the first floor, the building houses a repair garage with an in-floor repair pit and equipment workspace, and a single washroom/laundry and storage room. The second floor, accessed via open wooden stairs, houses an office and a storage room.

The building is of wood frame construction with a sloped roof clad in asphalt shingles, with vertical pre-painted metal siding. Interior finishes of the walls and ceilings consist of painted hardboard.

The asphalt shingles have reached the end of their service life and require replacement. The metal siding requires painting to extend its service life. In the building interior, it is recommended to replace the service pit receptacles, switches, and wiring to meet code requirements for fire ratings.

The 37 m^2 carpentry shop is a wood frame building which consists of a single open interior space, which was formerly a workshop, but now acts as storage for grounds maintenance equipment, tires, line tools,

[16] Provided as Appendix E of this proposal.

and other equipment. The building has a sloped roof with asphalt shingles, vinyl siding, one residential-type metal access door, vinyl sliding windows, and is founded on what appears to be wood blocks with skirted space between the floor and grade. The building is in fair to good condition with minor architectural and electrical upgrades recommended.

A condition assessment is provided as part of this proposal.[17]

4.0 Trending

As part of its initiative to continually improve its asset management strategy for facilities, Hydro intends to complete condition assessments for its remaining buildings. As such, the forecast trending data outlined below is subject to change.

4.1 Assets Installed/Replaced/Upgraded

In 2027, Hydro intends to address 19 medium-risk items under this program, as outlined in Appendix A.[18] Chart 1 provides the five-year historical, current 2027, and four-year forecast number of assets installed/replaced/upgraded per year. Five-year historical and current data have been compiled based on individual projects and programs for sustaining work related to Hydro's facilities assets in its CBA. Beginning in 2026, work scopes have been prioritized by assigning an overall risk rating to each item; this approach will ensure that high-risk items are addressed first. After incorporating the high-risk items, risk spend efficiency is considered for all medium-risk items, thus enabling the scope of medium-risk refurbishment work to be selected.

For the 2027 CBA, work scopes and asset condition were primarily derived from existing assessments, which have been completed on a select number of facilities. Hydro anticipates having additional condition assessments completed to inform the scope of this program in 2028; however, until that time, there are limited risk items identified beyond 2027.

[17] Provided as Appendix F of this proposal.
[18] Hydro is proposing to begin engineering design for one high-risk scope and three medium risk scopes in 2027; however, the risk associated with these scopes will not be considered resolved until construction is completed in 2028.

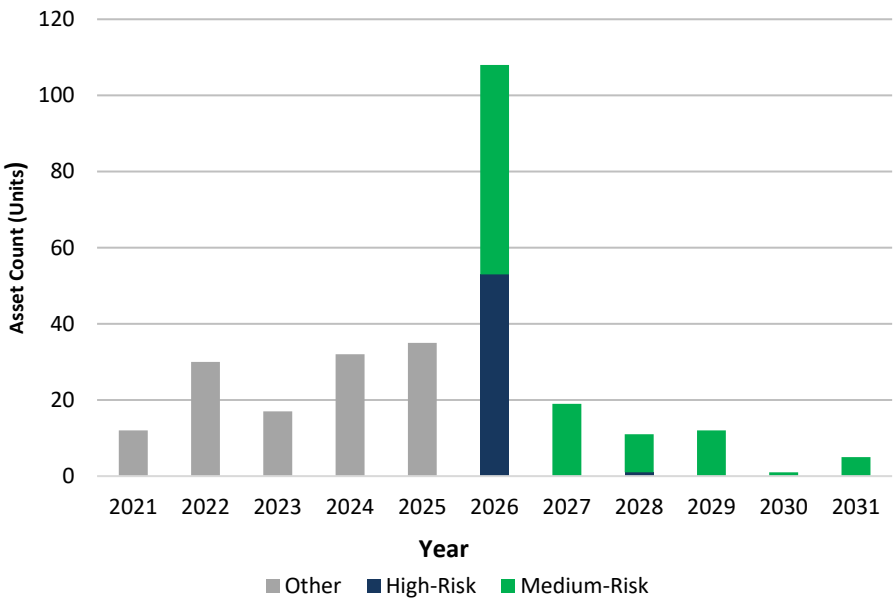


Chart 1: Historical and Forecast Number of Assets Installed/Replaced/Upgraded

4.2 Historical and Forecast Average Unit Costs

Historical and forecast program costs are provided in Chart 2 in Section 6.1. Due to the nature of this program and the range of assets covered, average unit cost information is not applicable.

5.0 Analysis

5.1 Evaluation of Alternatives

Hydro evaluated the following alternatives:

- Perform Refurbishments at Reduced Pace;
- Pace Advancement; and
- Continue at Current Pace.

5.1.1 Perform Refurbishments at Reduced Pace

This program is for the completion of miscellaneous refurbishment work on Hydro's facilities asset base. The proposed scope will serve to improve the assets' condition, ensure adherence to regulatory requirements, and extend the service life of Hydro's facilities. This program will support regular investment to conduct critical facilities management activities, extend the service life of the asset, and defer holistic replacement costs.

A reduction in the pace of this program would result in high-and-medium risk items going unaddressed, which could result in safety hazards and/or accelerated deterioration of facilities infrastructure. Hydro therefore does not believe that pace reduction is prudent or appropriate as an alternative.

5.1.2 Pace Advancement

Advancing the pace of this program would see certain assets replaced prior to reaching their useful service life. As such, Hydro does not consider advancing the pace of this program to be a viable alternative.

5.1.3 Continue at Current Pace

In the interest of balancing cost and reliability, Hydro has carefully considered its capital investment portfolio for this program in 2027 to ensure it is achievable and is focused on the most critical work required to support the safe, reliable operation of Hydro's system, in an environmentally responsible manner.

5.2 Least-Cost Evaluation

Hydro has not identified any viable alternatives to facilitate a least-cost evaluation.

5.3 Recommended Alternative

Hydro is recommending the completion of the refurbishments proposed as part of this program at its current pace. This will serve to address or improve occupant health and safety, loss prevention, capital renewal or recapitalization, climate change mitigation, and adaptation needs to restore or extend the service life of a facility, while ensuring the work proposed can be executed with the available resources.

5.3.1 Risk of Asset Stranding

The facilities which comprise the scope of refurbishment work under this program are critical building systems. These buildings are essential to Hydro's operations and will remain in service for the foreseeable future. Assets replaced or refurbished under this program have an inherently low risk of asset stranding.

5.3.2 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027 program in accordance with Hydro's Capital Risk Assessment process, as outlined in Section 7.0 of Schedule 1. The outcome of this assessment is provided in Table 1.

Table 1: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	4	4	**16**
Post-Implementation	4	1	**4**
		Risk Mitigated	**12**
		Risk Mitigated per $1 Million	**8.2**

6.0 Scope of Work

The scope of work for this program includes the necessary refurbishments to various facilities in Hydro's building asset base. The proposed refurbishments are recommended following the completion of a series of condition assessments from 2017 to 2025.

Additionally, the program includes a $250,000 "Facilities In-Service Failures" allowance, which has been established to cover the replacement or refurbishment of failed assets, or incipient failures to facilities requiring immediate action. Hydro proposes to utilize this program as a proactive Asset Management approach to address deficiencies so that the necessary refurbishments can be incorporated into the CBA. However, there are situations where immediate refurbishment, which has not been included in a CBA, must be undertaken due to the occurrence of an unanticipated failure or the recognition of an incipient failure. This is necessary to maintain the delivery of safe, reliable electricity at least cost in an environmentally responsible manner. With aging assets, unanticipated failures are expected to increase.

For the 2027 CBA, work scopes and asset condition were primarily derived from existing assessments. Hydro does not intend to complete each scope item identified in the condition assessments in 2027, as work scopes have been prioritized by assigning an overall risk rating to each item; this approach will ensure that high-risk items are addressed first. After incorporating the high-risk items, risk spend efficiency is considered for all medium-risk items, thus enabling the scope of medium-risk refurbishment work to be selected. A summary of the facilities and their respective refurbishments is provided in Table 2.

Table 2: 2027 Program Scope and Consultant Recommendation

Building	2027 Program Scope	Consultant Recommendation
Hydro Place Office	• Rehabilitation of leaking exterior window units.	Hydro Place Building Envelope Assessment, Read Jones Christofferson Ltd. – Appendix B, pp. 9 of 40.
Ramea Diesel Generating Station Powerhouse	• Detailed engineering design of building structure refurbishment.	Ramea Diesel Plant Structural Condition Assessment, Exploits Engineering Consultants Limited – Appendix C, pp. 27 of 28.
Stephenville Main Office Building, Garage and Warehouse	• Exterior envelope refurbishments (Warehouse); • Overhead door replacement (Warehouse, Garage) • Miscellaneous plumbing refurbishments (Office); and • Miscellaneous electrical refurbishments (Main Office, Garage, Warehouse).	Building and Infrastructure Condition Assessment Stephenville Office Facility, CBCL Ltd. – Appendix D, pp. 14–17 of 238, pp. 66–69 of 238.
Bishop's Falls Office/Warehouse	• Exterior canopy light replacement; and, • Miscellaneous HVAC refurbishments.	Building and Infrastructure Condition Assessment Bishop's Falls Office/Warehouse, CBCL Ltd. – Appendix E, pp. 8–11 of 156, pp. 40–42 of 156.
Whitbourne Carpentry Shop, Depot/Office Building, Garage and Storage	• Detailed engineering design for exterior envelope refurbishments (Depot/Office); • Exterior envelope refurbishments (Garage, Carpentry Shop); • Miscellaneous exterior refurbishments (Office, Carpentry Shop, Garage); and • Miscellaneous electrical refurbishments (Carpentry Shop, Garage).	Building and Infrastructure Condition Assessment Whitbourne Eastern Area Depot, CBCL Ltd., – Appendix F pp. 13–17 of 213, pp. 64–69 of 213.

6.1 Program Budget

The estimate for the 2027 program is shown in Table 3.

Table 3: Program Estimate ($000)

Program Cost	2027	2028	Beyond	Total
Material Supply	22.1	0.0	0.0	**22.1**
Labour	417.4	0.0	0.0	**417.4**
Consultant	208.2	0.0	0.0	**208.2**
Contract Work	574.5	0.0	0.0	**574.5**
Other Direct Costs	52.1	0.0	0.0	**52.1**
Interest and Escalation	41.3	0.0	0.0	**41.3**
Contingency	154.6	0.0	0.0	**154.6**
Total	**1,470.2**	**0.0**	**0.0**	**1,470.2**

Chart 2 provides the 2026 forecast, the proposed 2027 program budget, and the forecast budget for the next four years. As this program was initiated in 2026, five-year historical program expenditures are not applicable. The forecast budget over the next four years is expected to remain stable as Hydro seeks to balance cost and reliability while undertaking this program, and to ensure it represents an achievable level of execution success.

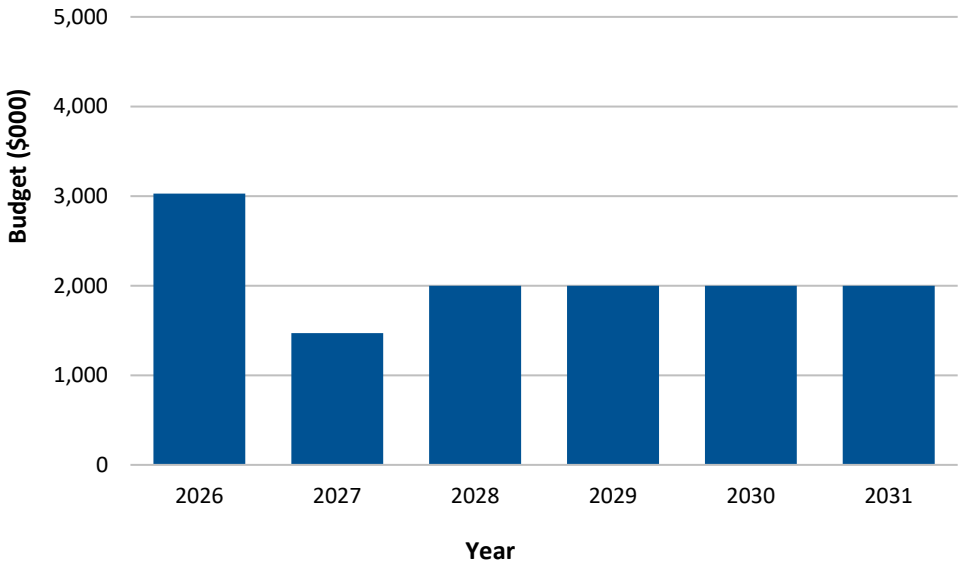


Chart 2: Historical and Forecast Program Budget

6.2 Program Schedule

The schedule for the 2027 program is shown in Table 4.

Table 4: Program Schedule

Activity	Start Date	End Date
Planning: Open work orders, review scope statement; develop detailed schedules.	January 2027	March 2027
Design: Complete detailed design, prepare tender packages.	February 2027	November 2027
Procurement: Tender and award work scopes.	February 2027	May 2027
Construction: Complete facility refurbishments.	April 2027	November 2027
Closeout: Close work orders, complete all documentation, and complete lessons learned.	November 2027	December 2027

7.0 Conclusion

This program will support regular investment to conduct critical facilities maintenance activities. Facility maintenance is crucial for protecting investments, ensuring safety, and maintaining operational efficiency, ultimately leading to cost savings, extended equipment life, and ensuring an adequate work environment for occupants.

Appendix A

Risk Ranking Summary



Risk Ranking Summary

Expense Ty: Capital

Status Planning

* - Risk ranking within the Facilities Refurbishment Program has not been completed for scopes beyond 2027. The Risk Year for scopes beyond 2027 are based on inclusions in the 5 Year Plans and are subject to change base on future program risk ranking.

Risk Rank	RM/M	Risk Year	Materiality	Project	Portfolio	Building	Item Desc	Impact Type
1. High	10	2027	2. Under $1M	HPD Generating Station (1991) - Roofing and Penetrations	Diesel Generation	HPD Generating Station (1991)	Replace roofing and roofmount fans to wallmount	Reliability
2. Med	540	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	SVL Garage (1990)	Replace T12 fluorescent light fixtures with T8 or LED fixtures	Reliability
2. Med	270	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	SVL Warehouse Building (1976)	Replace T12 lighting with T8 or LED	Environment
2. Med	260	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Carpentry Shop (1971)	Replace baseboard heaters	Environment
2. Med	260	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Carpentry Shop (1971)	Replace door	Reliability
2. Med	260	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Carpentry Shop (1971)	Replace roof shingles	Reliability
2. Med	209	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	SVL MAIN OFFICE BLDG (1942)	Replace copper domestic water piping	Reliability
2. Med	209	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	SVL Warehouse Building (1976)	Replace overhead doors	Reliability
2. Med	207	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Carpentry Shop (1971)	Replace all old receptacles and lighting switches, including the outlet boxes and faceplates	Reliability
2. Med	135	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	SVL MAIN OFFICE BLDG (1942)	Replace hot water tank and provide hinged door on tank enclosure	Reliability
2. Med	128	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Garage BL DG (1982)	All old receptacles and lighting switches, including the outlet boxes and faceplates to be replaced	Reliability
2. Med	125	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	SVL MAIN OFFICE BLDG (1942)	Replace T12 fluorescent light fixtures with T8 or LED fixtures	Reliability
2. Med	108	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	SVL Garage (1990)	Replace overhead doors	Reliability
2. Med	100	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Garage BL DG (1982)	Replace roof shingles	Reliability
2. Med	100	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Garage BL DG (1982)	Repaint metal siding	Reliability
2. Med	17	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Depot/Office (1975)	Replace metal siding	Environment
2. Med	17	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Depot/Office (1975)	Replace remaining three fibreglass overhead doors	Reliability
2. Med	17	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Depot/Office (1975)	Replace metal roofing	Reliability
2. Med	16	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	BIF Office/Warehouse (1971)	Replace exterior doors, frames and hardware	Reliability
2. Med	16	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	BIF Office/Warehouse (1971)	Replace the server room split air conditioning unit	Reliability
2. Med	16	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	BIF Office/Warehouse (1971)	Replace the second floor split air conditioning unit	Safety
2. Med	14	2027	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	BIF Office/Warehouse (1971)	Replace all old exterior lights under canopies and above exterior doors with new LED fixtures	Safety
2. Med	12	2027	3. BTW $1M & $5M	Facility Refurbishment Reserve Fund	Diesel Generation	CTW Powerhouse (1987)	Replace Roof (2027-2028) - Cartwright	Safety
2. Med	8	2027	1. Under $750k	Facility Refurbishment Reserve Fund	Terminals	CONTROL BUILDING, BBK TS1 (1968)	Install Fire Protection in 230 kV Stations (2027–2028) - Bottom Brook	Reliability
2. Med	2	2027	4. Over $5M	HYP Hydro Place (1989) - Envelope Renewal - Openings	HYP Corporate Services	HYP Hydro Place (1989)	Replace Failed IGUs and Restore Curtain Wall Seals	Reliability
1. High	21	2028	1. Under $750k	RAM Generating Station (1997) - Exterior Structural Steel Refurbishment	Diesel Generation	RAM Generating Station (1991)	Replacement and/or reinforcement of exterior wall structural steel	Reliability
2. Med	*	2028	1. Under $750k	Facility Refurbishment Reserve Fund	HYP Corporate Services	HYP Hydro Place (1989)	Fire Panel and Devices Upgrade (2027) - Hydro Place	Reliability
2. Med	*	2028	1. Under $750k	Facility Refurbishment Reserve Fund	HYP Corporate Services	HYP Hydro Place (1989)	HYP Replace/Upgrade Fire Suppression Sys (2028) - IS Server Room	Reliability
2. Med	*	2028	1. Under $750k	Facility Refurbishment Reserve Fund	NWS	DLO Office (1982)	Refurbish Office - Energy Efficiency and HVAC (2026–2027) - Deer Lake	Reliability
2. Med	*	2028	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Depot/Office (1975)	Replace metal siding	Reliability
2. Med	17	2028	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Depot/Office (1975)	Replace metal roofing	Reliability
2. Med	17	2028	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Depot/Office (1975)	Replace remaining three fibreglass overhead doors	Reliability
2. Med	17	2028	3. BTW $1M & $5M	Facility Refurbishment Reserve Fund	Diesel Generation	CTW Powerhouse (1987)	Replace Roof (2027-2028) - Cartwright	Reliability
2. Med	*	2028	2. Under $1M	BDE Powerhouse 2 (1966) - Roofing and Penetrations	Hydro Generation	BDE Powerhouse 2 (1966)	Replace Powerhouse 2 Roof (2028) - Bay d'Espoir	Reliability
2. Med	*	2028	1. Under $750k	Facility Refurbishment Reserve Fund	HYP Corporate Services	HYP Hydro Place (1989)	Replace HVAC Equipment (2028-2029) - Hydro Place [Chiller L1 MECH RM / AHU-9 ECC]	Reliability
2. Med	*	2028	1. Under $750k	Facility Refurbishment Reserve Fund	Terminals	CONTROL BUILDING, BBK TS1 (1968)	Install Fire Protection in 230 kV Stations (2027–2028) - Bottom Brook	Reliability
2. Med	*	2028	4. Over $5M	HYP Hydro Place (1989) - Envelope Renewal - Openings	HYP Corporate Services	HYP Hydro Place (1989)	Replace Failed IGUs and Restore Curtain Wall Seals	Reliability
2. Med	*	2028	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services		Refurbish Line Depots (2028) - Baie Verte	Reliability
2. Med	*	2028	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services		Refurbish Line Depots (2028) - South East Bight	Environment
2. Med	*	2029	1. Under $750k	Facility Refurbishment Reserve Fund	Thermal Generation	HRD MAIN POWERHOUSE (1969)	Perform Level 2 Condition Assessment - Site Buildings (2029) - Holyrood	Reliability
2. Med	*	2029	1. Under $750k	Facility Refurbishment Reserve Fund	HYP Corporate Services	HYP Hydro Place (1989)	Fire Panel and Devices Upgrade (2027) - Hydro Place	Reliability
2. Med	*	2029	1. Under $750k	Facility Refurbishment Reserve Fund	NWS	DLO Office (1982)	Refurbish Office - Energy Efficiency and HVAC (2026–2027) - Deer Lake	Reliability
2. Med	*	2029	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Depot/Office (1975)	Replace copper domestic water piping throughout facility	Reliability
2. Med	*	2029	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	BIF Office/Warehouse (1971)	Replace metal siding	Reliability
2. Med	*	2029	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	BIF Office/Warehouse (1971)	Replace the original building domestic water piping	Reliability
2. Med	*	2029	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	SVL Garage (1990)	Panels should be replaced within the next ten (10) years	Reliability
2. Med	*	2029	1. Under $750k	Facility Refurbishment Reserve Fund	HYP Corporate Services	HYP Hydro Place (1989)	Replace HVAC Equipment (2028-2029) - Hydro Place [Chiller L1 MECH RM / AHU-9 ECC]	Reliability
2. Med	*	2029	1. Under $750k	Facility Refurbishment Reserve Fund	HYP Corporate Services	HYP Hydro Place (1989)	HYP Straight Fluorescent Lamps Replacement - 2,345 FT Plus Occupancy Sensors	Reliability
2. Med	*	2029	2. Under $1M	HLK Powerhouse (1980) - Roofing and Penetrations	Hydro Generation	HLK Powerhouse (1980)	Replace Powerhouse Roofs (2027–2028) - Hinds Lake	Reliability
2. Med	*	2029	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	BIF Office/Warehouse (1971)	Replace electric heating equipment	Reliability
2. Med	*	2029	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	BIF Office/Warehouse (1971)	Replace roof finishes	Reliability
2. Med	*	2029	3. BTW $1M & $5M	HRD MAIN POWERHOUSE (1969) - Roofing and Penetrations	Thermal Generation	HRD MAIN POWERHOUSE (1969)	Replace Roof Drains	Reliability
2. Med	*	2029	3. BTW $1M & $5M	HRD MAIN POWERHOUSE (1969) - Roofing and Penetrations	Thermal Generation	HRD MAIN POWERHOUSE (1969)	Replace Roof (WTP Lab Section)	Safety
2. Med	*	2029	3. BTW $1M & $5M	HRD MAIN POWERHOUSE (1969) - Roofing and Penetrations	Thermal Generation	HRD MAIN POWERHOUSE (1969)	Replace Roof (Original Worshop - Machine/Mechanical Shop)	Safety
2. Med	*	2029	3. BTW $1M & $5M	HRD MAIN POWERHOUSE (1969) - Roofing and Penetrations	Thermal Generation	HRD MAIN POWERHOUSE (1969)	Replace Roof Drains (Worshop Extension - Welding Shop)	Safety
2. Med	*	2029	3. BTW $1M & $5M	HRD MAIN POWERHOUSE (1969) - Roofing and Penetrations	Thermal Generation	HRD MAIN POWERHOUSE (1969)	Replace HVAC Exhaust Fans (Unit 2)	Safety
2. Med	*	2029	4. Over $5M	HYP Hydro Place (1989) - Envelope Renewal - Openings	HYP Corporate Services	HYP Hydro Place (1989)	Replace Failed IGUs and Restore Curtain Wall Seals	Safety
2. Med	*	2030	2. Under $1M	HLK Powerhouse (1980) - Roofing and Penetrations	Hydro Generation	HLK Powerhouse (1980)	Replace Powerhouse Roofs (2027–2028) - Hinds Lake	Safety
2. Med	*	2030	3. BTW $1M & $5M	HRD MAIN POWERHOUSE (1969) - Roofing and Penetrations	Thermal Generation	HRD MAIN POWERHOUSE (1969)	Replace Roof Drains	Safety
2. Med	*	2030	3. BTW $1M & $5M	HRD MAIN POWERHOUSE (1969) - Roofing and Penetrations	Thermal Generation	HRD MAIN POWERHOUSE (1969)	Replace Roof (WTP Lab Section)	Safety
2. Med	*	2030	3. BTW $1M & $5M	HRD MAIN POWERHOUSE (1969) - Roofing and Penetrations	Thermal Generation	HRD MAIN POWERHOUSE (1969)	Replace Roof (Original Worshop - Machine/Mechanical Shop)	Safety
2. Med	*	2030	3. BTW $1M & $5M	HRD MAIN POWERHOUSE (1969) - Roofing and Penetrations	Thermal Generation	HRD MAIN POWERHOUSE (1969)	Replace Roof Drains (Worshop Extension - Welding Shop)	Safety
2. Med	*	2030	3. BTW $1M & $5M	HRD MAIN POWERHOUSE (1969) - Roofing and Penetrations	Thermal Generation	HRD MAIN POWERHOUSE (1969)	Replace HVAC Exhaust Fans (Unit 2)	Reliability
2. Med	*	2030	3. BTW $1M & $5M	CAT Powerhouse (1982) - Roofing and Penetrations	Hydro Generation	CAT Powerhouse (1982)	Replace Powerhouse Roof (2029) - Cat Arm	Reliability
2. Med	*	2030	4. Over $5M	HYP Hydro Place (1989) - Envelope Renewal - Openings	HYP Corporate Services	HYP Hydro Place (1989)	Replace Failed IGUs and Restore Curtain Wall Seals	Reliability
2. Med	*	2031	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Carpentry Shop (1971)	Install new main disconnect and main load center with sufficient spare capacity	Reliability
2. Med	*	2031	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	SVL MAIN OFFICE BLDG (1942)	Panels A, B, and the hallway loadcenters should be replaced within the next five (5) years	Reliability
2. Med	*	2031	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Garage BL DG (1982)	New main disconnect and panelboard with sufficient spare capacity to be installed	Reliability
2. Med	*	2031	1. Under $750k	Facility Refurbishment Reserve Fund	TRO Regional Services	WHB Depot/Office (1975)	Install new panelboards with sufficient spare capacity	Reliability
2. Med	*	2031	3. BTW $1M & $5M	CAT Powerhouse (1982) - Roofing and Penetrations	Hydro Generation	CAT Powerhouse (1982)	Replace Powerhouse Roof (2029) - Cat Arm	Reliability
2. Med	*	2031	4. Over $5M	HYP Hydro Place (1989) - Envelope Renewal - Openings	HYP Corporate Services	HYP Hydro Place (1989)	Replace Failed IGUs and Restore Curtain Wall Seals	Reliability
2. Med	*	2031	4. Over $5M	HRD MAIN POWERHOUSE (1969) - Space Heater Renewal	Thermal Generation	HRD MAIN POWERHOUSE (1969)	Install Plant Heating System (2026-2027) - Holyrood	Reliability

Appendix B

Hydro Place Building Envelope Assessment (2024)

Hydro Place Building Envelope Assessment

500 Columbus Drive, St. John's, NL Toronto, ON



Prepared for:

Steven Drew
Facilities LTAP Specialist
Newfoundland and Labrador Hydro
Hydro Place, 500 Columbus Drive,
St. John's, NL A1B 4K7

Prepared by:

Read Jones Christoffersen Ltd.
100 University Ave, North Tower, Suite 300
Toronto, ON M5J 1V6

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EXECUTIVE SUMMARY

Read Jones Christoffersen Ltd. (RJC) was retained by Newfoundland and Labrador Hydro (HNL) to assist with the building envelope assessment at 500 Columbus Dr. in St. John's, Newfoundland. This report is a summary of our observations, conclusions, recommendations and opinions of probable costs findings.

Hydro Place, the building located at 500 Columbus Dr. in St. John's, Newfoundland, is a 6-commercial office building using reinforced cast-in-place concrete structure including foundation walls, piers, columns, floor slabs and roof slabs. The building was constructed circa 1988 and the building management has experienced leaking and water infiltration around the windows for several years. The precast panels were face-sealed in 2018 with reports that leaks have continued.

In general, the curtain walls and punched windows are in fair-to-poor condition commensurate with their age. Based on our review of available documents, we understand several areas of curtain wall are experiencing leakage indicating that the exterior and concealed seals have failed. Additionally, our visual review identified numerous fogged insulating glass units (IGU's) that should be replaced as part of the window replacement.

As the glazing systems continue to age, IGU failure as well as air and moisture leakage will continue to occur at an accelerated rate. As such, the following repair options are recommended to restore their original design intent and prevent leaks. RJC recommends Options 1, 2, and 3 be considered for a baseline rehabilitation for the building.

Option	Description	Timeline	Opinion of Probable Cost
1	Wholesale Curtain Wall Rehabilitation (excluding IGUs)	0-2 years	$2,800,000
2	Targeted IGU Replacement	0-2 years	$150,000
3	Lobby Curtain Wall Rehabilitation	0-2 years	$110,000
4	Wholesale IGU Replacement	0-2 years	$4,900,000
5	Replace precast seals with 2-stage joint	0-2 years	$400,000

1.0 INTRODUCTION

Read Jones Christoffersen Ltd. (RJC) was retained by Newfoundland and Labrador Hydro (HNL) to assist with the building envelope assessment at 500 Columbus Dr. in St. John's, Newfoundland. This report is a summary of our observations, conclusions, recommendations and opinions of probable costs findings.

The following scope of work was undertaken by RJC during the pre-design assessment:

.1 Detailed review of available architectural drawing(s) and report(s) to acquire a general understanding of the as-built construction and conditions.

.2 Visual review of the curtain wall exterior to identify the presence and extent of any visually obvious deterioration and/or deficiencies. In particular, a visual review of the exterior weather seals, glazing units, pressure plates, gaskets, etc. was undertaken.

.3 Visual review of 100% the interior of the building to identify the location of leaks, fogged units, cracked glass, vent operation, and to identify any patterns in failures.

.4 Thermographic scans of the building to correlate visual findings.

The date and weather conditions at the time of our visits were as follows:

- Visual Review January 16, 2024 Sunny, -2°C

Duncan Rowe, M.Eng., P.Eng., performed the exterior visual review and exterior exploratory opening reviews for Read Jones Christoffersen (RJC). ANDI performed the thermographic scans.

This report was prepared in accordance with generally accepted engineering practices. No other warranties, either expressed or implied, are made as to the professional services provided under the terms of our contract and included in this report.

Services performed and outlined in this report were based, in part, upon visual observations of the site and attendant structures. Our opinion cannot be extended to portions of the building that were not reviewed by RJC.

This report is exclusively for the use and benefit of the client identified on the first page of this report and is not for the use and benefit of, nor may it be relied upon by, any other person or entity. The contents of this report may not be quoted in whole or in part or distributed to any person or entity other than the client.

2.0 BACKGROUND INFORMATION

2.1 SITE DESCRIPTION

500 Columbus Drive is located southwest of the Captain Whelan Drive and Columbus Drive intersection in St John's, Newfoundland. The building is bound by parking lots to the west, greenbelt to the south, Columbus Drive to the east, and Captain Whelan Drive to the north.

(Refer to Photo No. 1 in Appendix A for the aerial view of the Hydro Place)

2.2 BUILDING DESCRIPTION

Hydro Place, the building located at 500 Columbus Dr. in St. Paul, Newfoundland, is a 6-commercial office building, constructed circa 1988. The building has an approximate area of 14,631 square meters and has 421 parking spaces. Internal finishes for ceilings, floors, and walls adhere to conventional standards for office occupancy.

The building structure consists of normally reinforced cast-in-place concrete foundations, columns, floor slabs that support the exterior cladding. The primary exterior cladding is precast concrete panels with an exposed stone aggregate finish that surround punched window openings. The windows are stick-built thermally-broken aluminum-framed curtain walls with double-glazed thermally-broken punched windows and hopper-style operable vents.

The roofs were recently replaced in 2015-2017 and are a conventional 2-ply modified bitumen system.

(Refer to Photo Nos. 2-5 in Appendix A)

2.3 DOCUMENT REVIEW

The following documents were made available for review:

.1 Partial Set of Architectural Drawings prepared by Beaton Sheppard Associates Limited, dated November 23, 1988.

These drawings were used to obtain a general understanding of the building layout and construction. In particular, the details included information on the arrangement of the cladding elements to help verify some concealed conditions and likely construction methodologies.

.2 Professional Services Request Building Envelope – Building Condition Assessment Report by SNC LAVALIN dated October, 2018.

This report was used to acquire a general understanding of the as-built construction and conditions as well as the history of reported leaks and repairs. In particular the 2018 report notes:

- Leaks have been reported at various locations, operable hopper units are not weather tight, numerous double glazed window seals have failed, metal spacers in sealed units are bending, anodizing has faded, insect screens are damaged. Major portion of problematic areas are occurring on building elevations facing south and west.
- Aluminum storefront and steel doors reported air and water infiltration at multiple locations and the anodizing has faded.
- Localized cladding sealant has replaced, with the replacement on the joints between the panels. However, the sealant around the windows has not replaced.

2.4 INTERVIEW

The following history and information was obtained through an interview with Steven Drew and Gerrard Waterman of HNL.

.1 Roof replacements were carried out from 2013-2017 and there have been no roof issues reported since replacement.

.2 When leaks occur, which is often, they occur from the wind-driven rain direction.

.3 The leak issues have prompted previous repairs that have included resealing at the precast. Leaks were reported to have continued since the resealing.

.4 Repairs to the interior of the operable windows, via caulking the interior or repairing the lever arms has been performed on an as-needed basis.

3.0 OBSERVATIONS

3.1 VISUAL OBSERVATIONS

A visual review of the building was performed from grade, select roofs, and the interior to identify the existing conditions and any visually obvious deficiencies with the building. The following observations were noted:

.1 The curtain walls consist of stick-built thermal broken aluminum frames with a 4-sided captured insulating glass units (IGUs), along with single-pane tempered glass spandrels insulated with mineral fiber. The IGUs noted to contain 1989 date stamps and they are generally in fair to poor condition with several windows cracked and showing an annealed breakage pattern. Based on their age and the increasing number of failed (fogged) units, the IGU's have reached the end of their useful service lives *(Refer to Photo No. 5-7 and 28 in Appendix A)*.

.2 In particular, we noted many smaller IGU failures around the building. The location of failures suggests that the system is retaining water in and around the glazing cavity accelerating IGU seal failures as well as being an increased risk for leaks. The fogging appears to have been experienced for an extended time as the interstitial spacer was found to be corroded in many locations. RJC noted 68 failed smaller and 6 larger IGU's from the interior review. These failures account for roughly 4.8% of the small units (~1,315) and 0.8% of the larger units (~789). *(Refer to Photo No. 8, and 14, 15 in Appendix A)*.

.3 The curtain wall seals, while generally concealed, are in poor condition overall due to the reported leaks during driving rain events. Additionally, the exterior gaskets and seals were found to have shrunk and allow for pooling of water. The interior gaskets appeared to be in poor condition overall and have reached the end of their service lives with visible signs of wear and tear, including cracking, degradation, and compromised elasticity. Failures of the interior seals can impact air leakage, as well as increase the risk of leaks in driving rain by creating failures of the pressure equalization cavity *(Refer to Photo No. 8-11 in Appendix A)*.

.4 The snap caps were noted to be in poor condition with visible signs of wear and deterioration including chalking of the coating and peeling of the coating indicating the exterior finish has failed *(Refer to Photo No. 18, 26 and 27 in Appendix A)*.

.5 The pressure plates noted to be in fair condition where visible, however, it was noted that they have been installed upside down in some areas *(Refer to Photo No. 16 in Appendix A)*.

.6 The lever arms on the operable hopper vents were noted to be in poor condition with visible corrosion and reports from the operations staff of many failures over the life of the building (*Refer to Photo No. 17 and 18 in Appendix A*).

.7 The weather stripping at the operable hopper vents appears to be in in poor condition with notable deficiencies including discontinuous, missing sections and fractures, particularly at the corners of the metal frame. (*Refer to Photo No. 12 and 13 in Appendix A*).

.8 Localized precast panel joints appeared to be in fair-to-poor condition overall with some areas of crazing and initial cohesive failures. While there was replacement of the joints between the concrete panels in 2018, it was noted that the sealant around the windows was not part of that program. Further, no weep holes were noted in the precast joints indicating the building is face-sealed *(Refer to Photo No. 19 to 21 in Appendix A).*

.9 Local areas of spalled precast where noted during the review. *(Refer to Photo No. 22 in Appendix A)*.

.10 Overall, the sealants between the window and precast, as well as metal-to-metal seals, are in poor condition which increases risk of leaks (*Refer to Photo No. 26 and 27 in Appendix A*).

.11 Some doors appeared in poor condition with potential for air and water infiltration at the sill with exposed aluminum shims visible at one door (*Refer to Photo No. 23 to 25 in Appendix A*).

3.2 THERMOGRAPHIC OBSERVATIONS

.1 The exterior thermographic observations noted the operable windows are a significant heat-loss component, with several of them appearing to be compromised. The majority of the remaining windows also exhibit signs of heat loss around the perimeter seals indicating a lack of air control continuity. Further, the doors also show thermal irregularities, particularly around perimeter seals, indicating a lack of airtightness *(Refer to ANDI Report in Appendix B)*.

.2 The interior thermographic observations continued to note poor air seals around the doors, window frames and the mechanical opening windows. This infiltration can impact surrounding walls and resulting in heat loss and possible condensation, though none was noted during the review. Condensation may be being managed through the hot air washing the windows from the heaters *(Refer to ANDI Report in Appendix B)*.

4.0 CONCLUSIONS/RECOMMENDATIONS AND OPINIONS OF PROBABLE COSTS

Based on our interview, visual review, the existing curtain wall and punched windows are not functioning as intended due to failed seals, both exterior and concealed. Additionally, there is a concern about poor tie-ins and original concealed detailing between the face-sealed precast and drained window systems. Based on our review, we also noted numerous IGU failures that correlate with a curtain wall system that is not draining well. This is supported by our visual findings as the curtain wall and punched window components, including the exterior and interior weather seals, were noted to be in poor condition overall.

Based on our review, wholesale rehabilitation of the curtain wall and IGUs is recommended to restore the original design intent. This work would re-use the existing curtain wall framing, minimizing disruption and costs, and would revitalize the concealed seals. This would include replacing snap caps, gaskets, fasteners, resealing back pans, and the concealed seals. This work is recommended to include targeted IGU replacement, though wholesale IGU replacement could be considered if budgets permit.

Further, precast joint replacement is another item that could be considered to bring the whole exterior system into a rain-screen design. If implemented that would require removing the existing precast sealant joints and adding a dual-seal system to create a rain-screen at the precast that could tie-in to the rehabilitated curtain wall. This would mean some premature replacement of the recently done sealant, however this added work would provide a full rain-screen assembly for the building greatly improving the leakage resistance and minimizing future life-cycle costing.

4.1 Wholesale Curtain Wall Rehabilitation

Description of Work:	
▪ Wholesale removal and replacement of snap caps, gaskets, and concealed seals. Wholesale re-sealing of back-pans with removal of the spandrel glass/metal ▪ Removal and reinstatement of pressure plates. ▪ Wholesale installation of corner plugs at mullion T-sections to promote drainage. ▪ Removal and replacement of existing operable hopper windows with new awning window to improve airtightness.	
Advantages	**Disadvantages**
▪ Restore original design intent ▪ Reduces the potential for air and moisture leakage. ▪ Long-Term Durability ▪ Reduced Maintenance Costs	▪ Initial cost. ▪ Tenant Disruption ▪ Excludes the lobby
Discussion:	
This rehabilitation focuses on a comprehensive overhaul of the building's window system to address leakage. The wholesale removal and replacement of snap caps, pressure plates (reused), fasteners, gaskets, and concealed seals, coupled with the wholesale re-sealing of back-pans, form a fundamental step in restoring the integrity of the windows. The addition of corner plugs at mullion T-sections aims to enhance drainage, contributing to long-term durability. This also includes the replacement of the existing hopper units with awning-style units to improve water resistance and minimize drafts.	
Opinion of Probable Cost:	**$2,800,000** **Can be phased over 2 years with small mobilization premium**

4.2 Targeted IGU Replacement

Description of Work:	
▪ Removal and replacement of the noted failed IGUs with a contingency for some additional units. ▪ Work includes the removal, disposal, and replacement to match existing and is concentrated at the smaller IGUs which have 63 failed units.	
Advantages	**Disadvantages**
▪ Restore original design intent ▪ Reduces the potential for air and moisture leakage. ▪ Long-Term Durability ▪ Reduced Maintenance Costs	▪ Initial cost. ▪ Tenant Disruption ▪ Older units remain at majority of buildings
Discussion:	
This scope includes for the targeted replacement of noted failed units. Based on the age of the building it wholesale IGU replacement can be undertaken, however targeted is a more cost-effective approach and is recommend to be included in the baseline scope to realize economies of scale.	
Opinion of Probable Cost:	**$150,000**

4.3 Lobby Curtain Wall Rehabilitation

Description of Work:	
▪ Wholesale removal and replacement of snap caps, gaskets, and concealed seals. Wholesale re-sealing of back-pans with removal of the spandrel glass/metal at the lobby ▪ Removal and reinstatement of pressure plates. ▪ Wholesale installation of corner plugs at mullion T-sections to promote drainage.	
Advantages	**Disadvantages**
▪ Restore original design intent ▪ Reduces the potential for air and moisture leakage. ▪ Long-Term Durability ▪ Reduced Maintenance Costs	▪ Initial cost. ▪ Tenant Disruption
Discussion:	
Simialr to 4.1 with this scope of work focused on the lobby zone specifically. This area is not currently experiencing leaks and could be deferred to reduce some capital expenditure.	
Opinion of Probable Cost:	**$110,000**

4.4 Wholesale IGU Replacement

Description of Work:	
▪ Removal and replacement of all IGUs to restore the full service life of the curtain wall assemblies. ▪ The existing IGUs are approaching the end of their useful life and replacing them in conjunction with the work in Option 1 will allow for a reset of the whole system with a new 30 year service life.	
Advantages	**Disadvantages**
▪ Restore original design intent ▪ Reduces the potential for air and moisture leakage. ▪ Long-Term Durability ▪ Reduced Maintenance Costs	▪ Very high capital cost ▪ Tenant Disruption
Discussion:	
This work would allow for a complete restoration of the curtain wall system and remove any maintenance cost for roughly 15 years. Proceeding with only a targeted IGU replacement address the current needs however ongoing replacement of the remaining older IGUs will be an on-going issue.	
Opinion of Probable Cost:	**$4,900,000**

4.5 Precast Joint Replacement

Description of Work:	
▪ Wholesale removal and replacement of the existing precast face-seal with a new 2-stage sealant joint and tie-in to the rehabilitated curtain wall system. ▪	
Advantages	**Disadvantages**
▪ Improves original design intent ▪ Creates full rain-screen assembly ▪ Long-Term Durability ▪ Reduced Maintenance Costs	▪ Costly as recently replaced ▪ Tenant Disruption
Discussion:	
This replacement includes for the removal and replacement of the precast seals, which have recently been replaced. This would improve the system to a rain-screen design, from the existing face-sealed design, and provide for a more durable system.	
Opinion of Probable Cost:	**$400,000**

4.1 OPTION SUMMARY

The table below summarizes all the available options in a total cost summary.

Option	Description	Timeline	Opinion of Probable Cost
1	Wholesale Curtain Wall Rehabilitation (excluding IGUs)	0-2 years	$2,800,000
2	Targeted IGU Replacement	0-2 years	$150,000
3	Lobby Curtain Wall Rehabilitation	0-2 years	$110,000
4	Wholesale IGU Replacement	0-2 years	$4,900,000
5	Replace precast seals with 2-stage joint	0-2 years	$400,000

The table below summarizes the recommended Options, which are 1-3 and 5. Option 4, Wholesale IGU Replacement, can be considered but is not critical to restoration of the overall air and water performance of the curtain wall system. Instead a yearly allowance for replacement as the IGUs continue to age has been carried below. The table below assumes the construction work be phased over 2 years to reduce cash flow impacts and thus carries a slight mobilization premium for splitting the work.

Option	Year 1	Year 2	Year 3	Year 4	Year 5
1	$1,500,000	$1,500,000	--	--	--
2	$150,000	--	--	--	--
3	$110,000	--	--	--	--
5	$200,000	$200,000	--	--	--
IGU Annual Allowance	--	--	$30,000	$30,000	$30,000
Total	**$1,960,000**	**$1,700,000**	**$30,000**	**$30,000**	**$30,000**

A contingency amount of 10% should be included in all construction budgets to allow for the following items:

- Variation in estimated unit prices due to competitive bidding.

- Additional work required due to hidden and/or unforeseen conditions uncovered during construction.

Please note that the options regarding the probable cost of repairs are in 2024 dollars and based upon the present extent of deterioration, historical unit prices from similar projects and conceptual repair strategies. Detailing of the various items for each design concept has not been fully developed, not have phasing or implementation schemes been selected. Probable costs do not include "soft costs," extended warranties, permits, H.S.T or engineering fees. No allowance has been made for escalation beyond this time due to unknown construction commencement. The opinions of probable costs should be considered Class "C" amounts[1].

[1] Class "C" probable costs – an outline description of overall scope sufficient for making investment decisions (degree of accuracy +/- 25%).

5.0 CLOSING COMMENTS

Thank you for selecting Read Jones Christoffersen Ltd. for this project. RJC would be pleased to assist you with the implementation of our recommendations. Should you have any questions or concerns, please do not hesitate to contact the people below.

Yours truly,

READ JONES CHRISTOFFERSEN LTD.



Duncan Rowe, M.Eng., P.Eng., LEED AP, CPHD
Principal
Building Science and Restoration

APPENDIX A

VISUAL REVIEW PHOTOGRAPHS



Photo No. 1: Aerial view of 500 Columbus Drive, St. John's, NL (highlighted in red)



Photo No. 2: Overview of the west elevation



Photo No. 3: Overview of the south elevation



Photo No. 4: Overview of the west elevation



Photo No. 5: Typical view of a 1989 IGU date stamp (red circle)

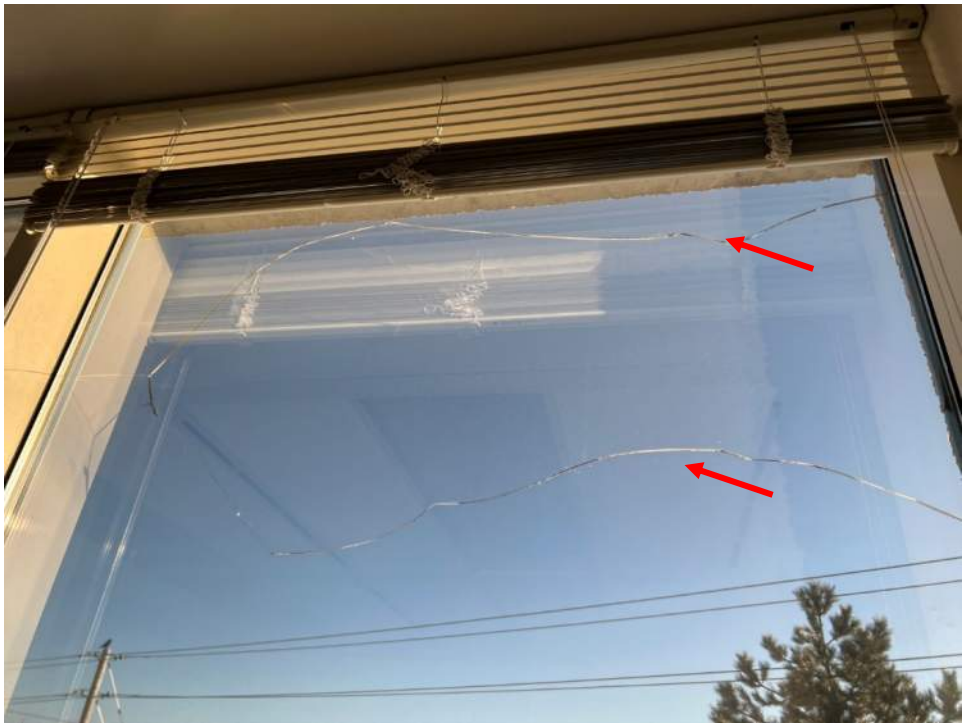


Photo No. 6: Typical view of cracked and showing an annealed breakage pattern windows (red arrows)



Photo No. 7: Typical view of cracked and showing an annealed breakage pattern windows (red arrow)



Photo No. 8: Typical view of curtain wall is in fair-to-poor condition overall (red arrows)



Photo No. 9: Overview of curtain wall is in fair-to-poor condition overall



Photo No. 10: Typical view of curtain wall is in fair-to-poor condition overall



Photo No. 11: Typical view of curtain wall is in fair-to-poor condition overall with fading of the exterior caps



Photo No. 12: Typical view of weather stripping appears in poor condition with gaps



Photo No. 13: Typical view of weather stripping appears in poor condition (red arrow)



Photo No. 14: Typical view of interior glass-to-metal gasket is noted to be poor condition and failed IGU (red arrow)



Photo No. 15: Typical view of interior glass-to-metal sealant is noted to be poor condition



Photo No. 16: Typical view of pressure plates that have been installed upside down (red arrow)



Photo No. 17: Typical view of roto gear on hopper windows was noted to be in poor condition with obvious signs of rust and corrosion (red arrow)



Photo No. 18: Typical view of rusted roto gear (red arrow)



Photo No. 19: View of the localized precast panel joints has been repaired (red arrows)

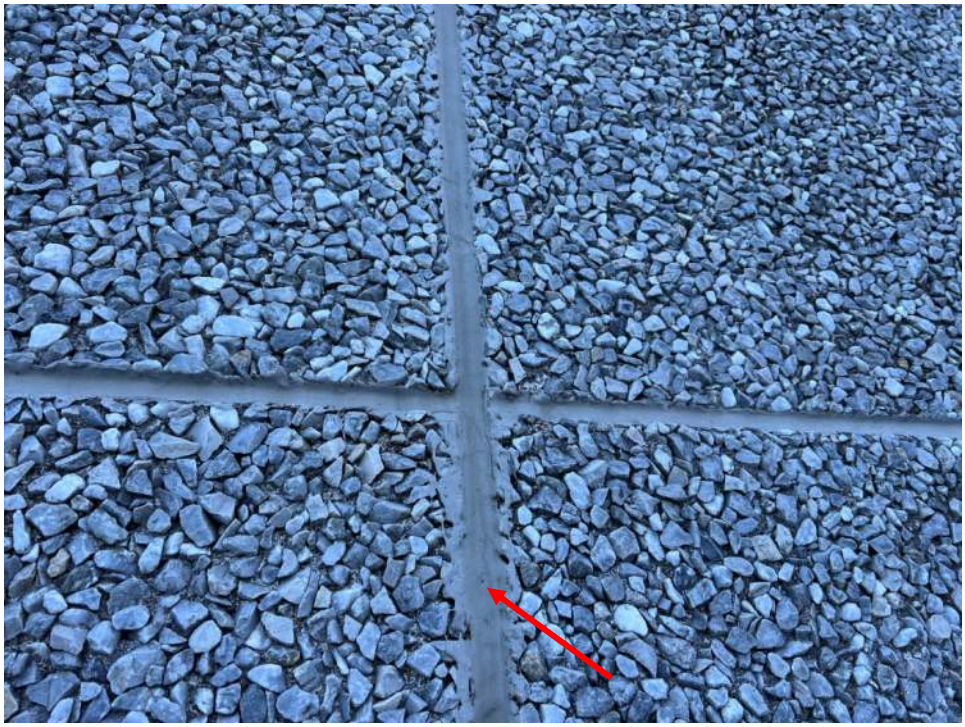


Photo No. 20: Typical view of localized precast panel joints crazing, and cohesive failures (red arrow)



Photo No. 21: Typical view of localized precast panel joints crazing, and cohesive failures



Photo No. 22: View of the precast panel surfaces was noted to be peeling or failing (red arrow)



Photo No. 23: Typical view of anodizing is noted faded, and there is rust formation at the bottom of the doors (red arrow)



Photo No. 24: Typical view of rust formation at the bottom of the doors (red arrow)



Photo No. 25: Typical view of aluminum storefront doors with exposed aluminum shims



Photo No. 26: Typical view of sealant in poor condition (red arrow)



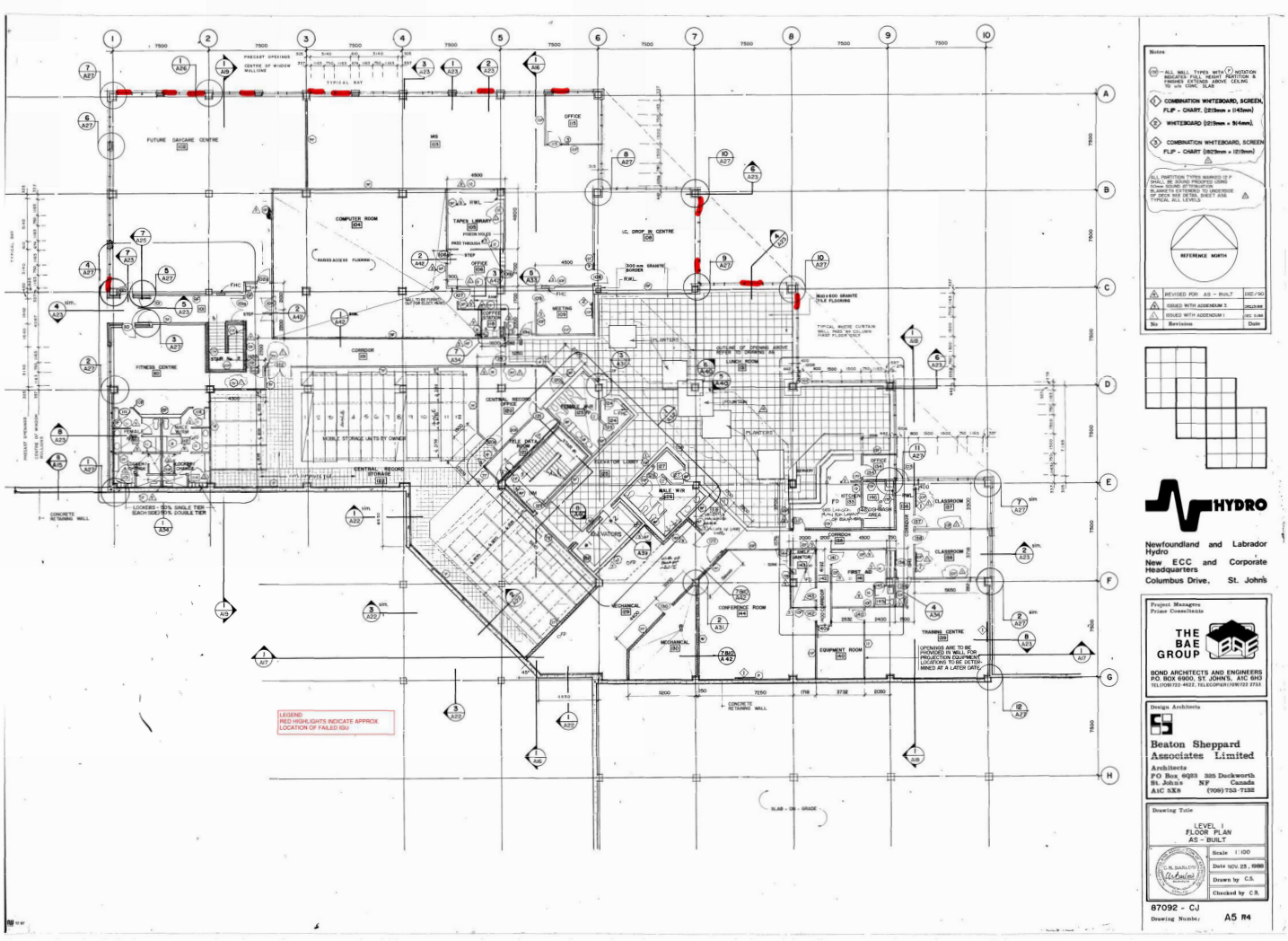
Photo No. 27: Typical view of adhesive sealant (red arrow)

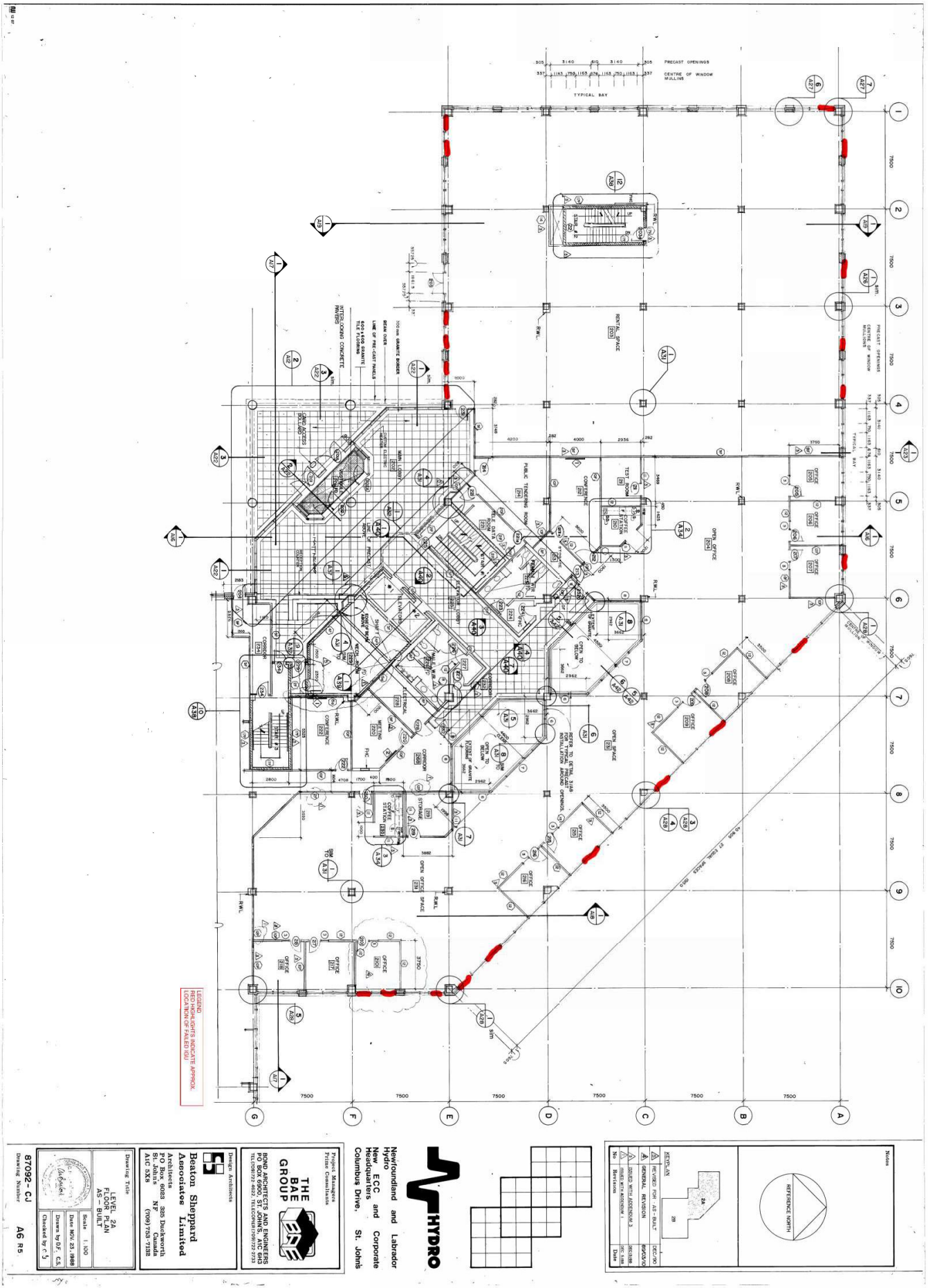


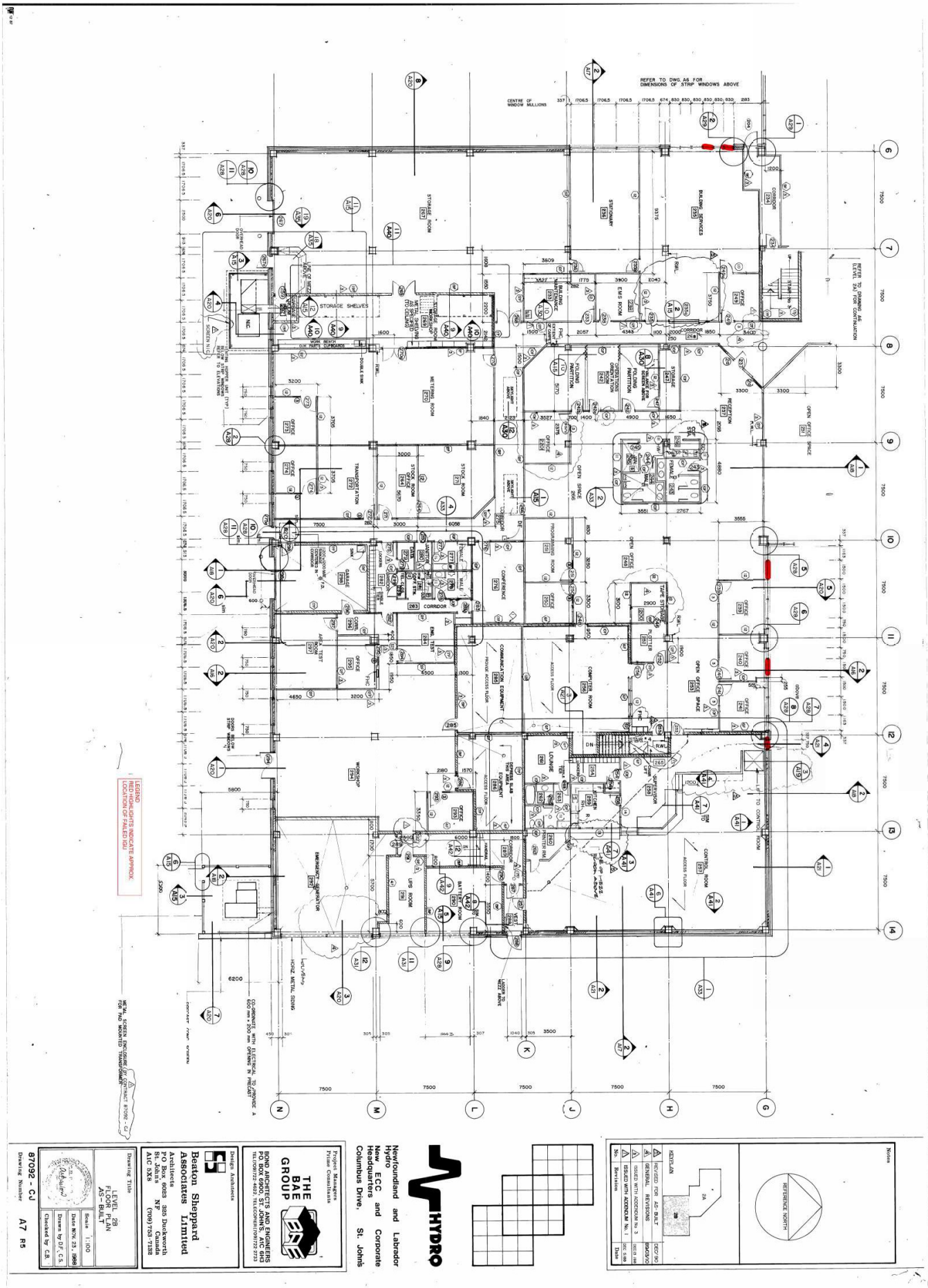
Photo No. 28: Typical view of punched windows in fair to poor condition with a missing snap cap (red arrow)

Appendix B

Approximate IGU Failure Locations


LEGEND
RED HIGHLIGHTS INDICATE APPROX LOCATION OF FAILED IGU
HYDRO
Newfoundland and Labrador Hydro
New ECC and Corporate Headquarters
Columbus Drive, St. Johns
THE BAE GROUP
BOND ARCHITECTS AND ENGINEERS
P.O. BOX 6900, ST. JOHN'S, A1C 5H3
Beaton Sheppard Associates Limited
Architects
PO Box 6923 325 Duckworth
St. John's NF Canada
A1C 5X8 (709) 753-7338
LEVEL 1
FLOOR PLAN
AS - BUILT
Scale 1:100
Drawn by C.S.
Checked by C.B.
87092 - CJ
A5 R4


LEGEND
RED HIGHLIGHTS INDICATE APPROX. LOCATION OF FAILED IGU
Newfoundland and Labrador Hydro
New ECC and Corporate Headquarters
Columbus Drive, St. John's
HYDRO
THE BAE GROUP
Beaton Sheppard Associates Limited
Architects
P.O. Box 6083 St. John's A1C 5X8
385 Duckworth St. John's NF Canada
(709) 753-7132
Drawing Title
LEVEL 2A FLOOR PLAN AS - BUILT
Scale 1:100
Date NOV. 23, 1988
Drawn by D.F. C.S.
Checked by C.J.
87092-CJ
Drawing Number
A6 R5
REFERENCE NORTH
REVISED FOR AS - BUILT
GENERAL REVISION
ISSUED WITH ADDENDUM 3
ISSUED WITH ADDENDUM 1
Revision
Date



Newfoundland and Labrador Hydro
New ECC and Corporate Headquarters
Columbus Drive, St. John's

HYDRO

No.	Revision	Date
1	ISSUED WITH ADDENDUM No. 1	DEC 3/99
2	ISSUED WITH ADDENDUM No. 3	DEC 13/99
A	GENERAL REVISIONS	DEC 20/99
B	REVISED FOR AS-BUILT	DEC 20/00

KEYPLAN

Notes

REFERENCE NORTH

Project Managers
Prime Consultants

THE BAE GROUP

BOND ARCHITECTS AND ENGINEERS
PO BOX 6900, ST. JOHN'S, NFLD. A1C 5X3
TELEPHONE (709) 722-7733

Design Architects

Beaton Sheppard Associates Limited

Architects
PO Box 9033 6255 Duckworth
St. Postal Station
St. John's, Nfld. A1C 5X8 (709) 753-7132

Drawing Title
LEVEL 2B FLOOR PLAN AS-BUILT

Scale 1:100

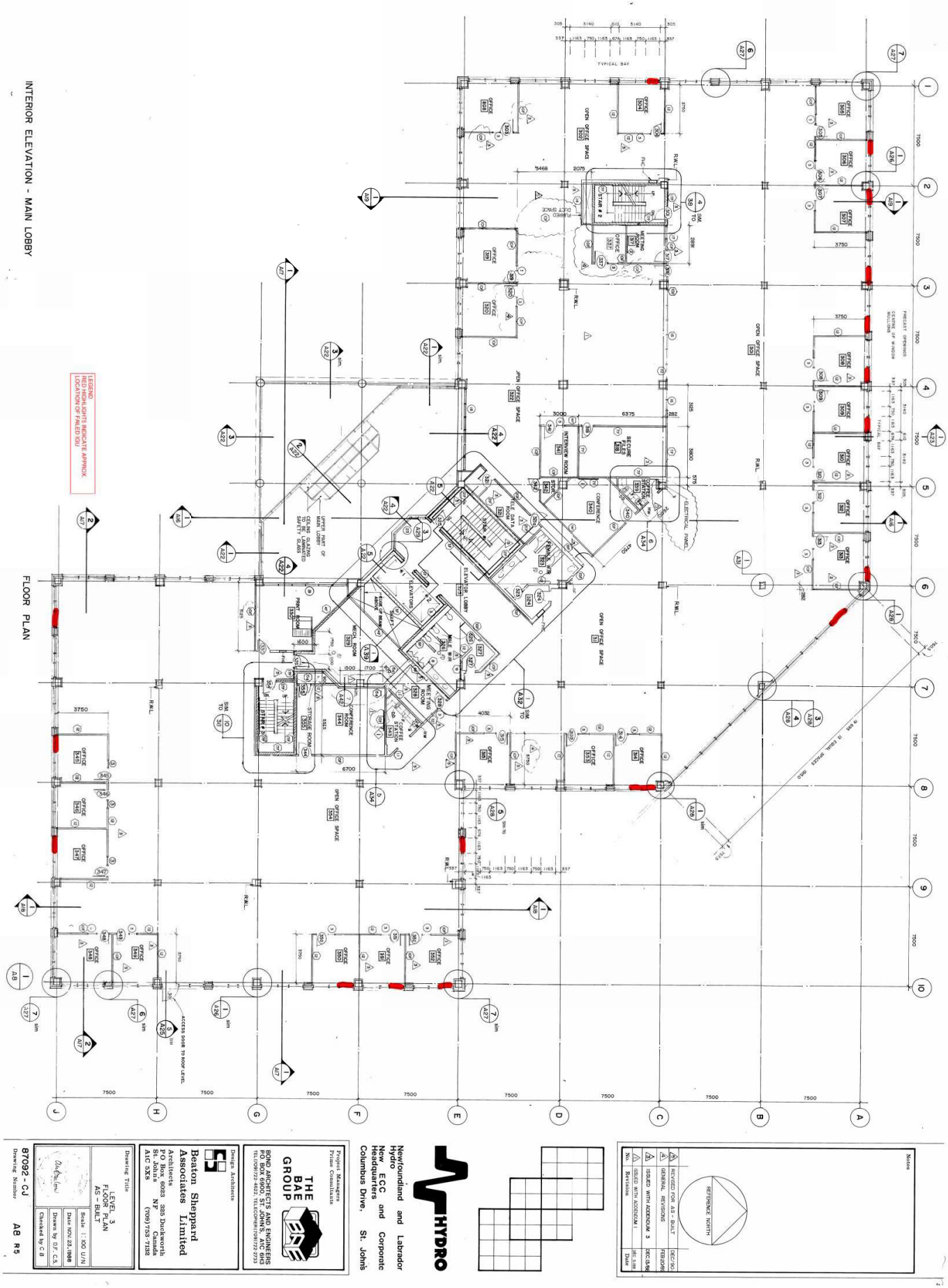
Date NOV. 23, 1999

Drawn by D.F., C.S.

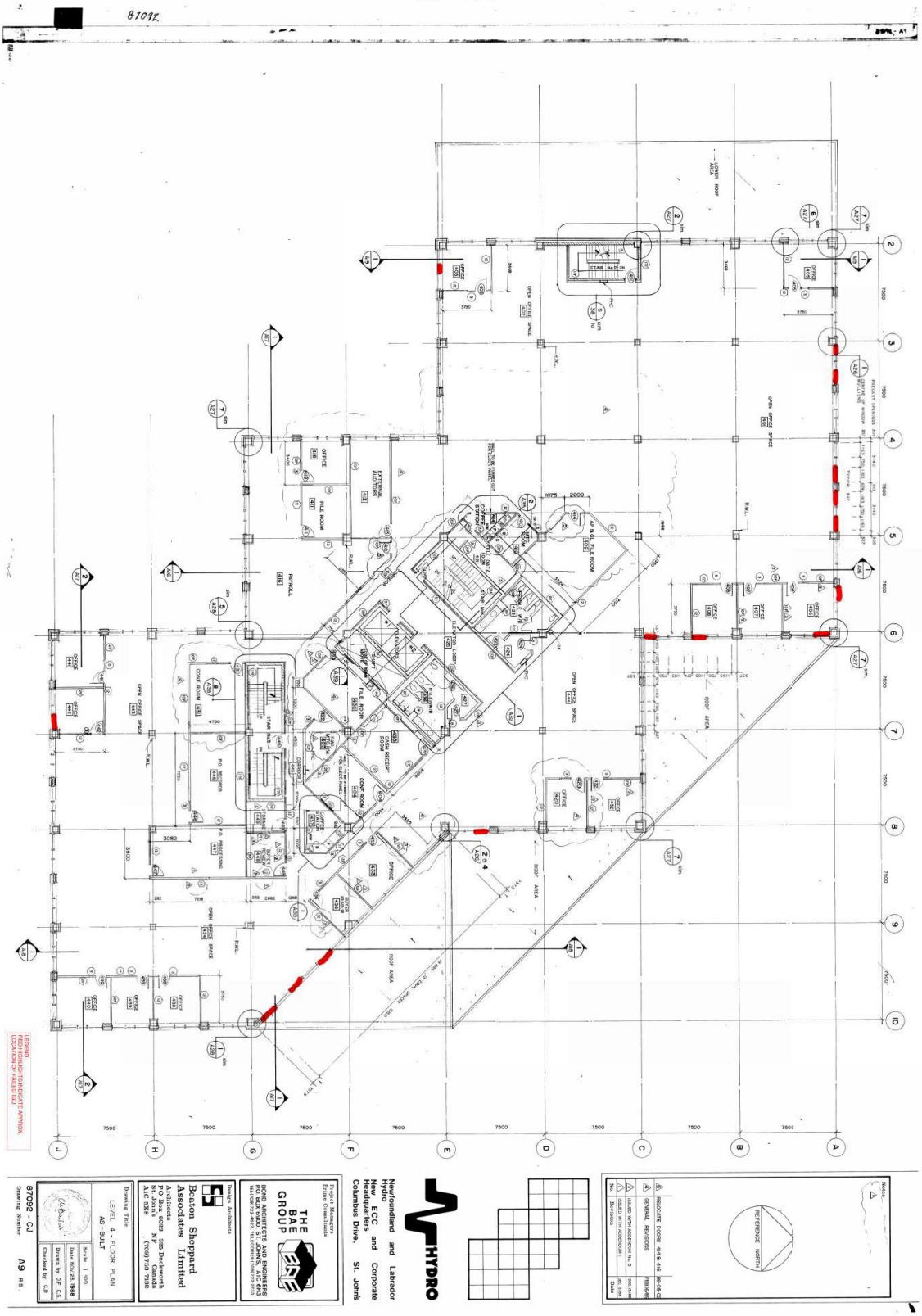
Checked by C.B.

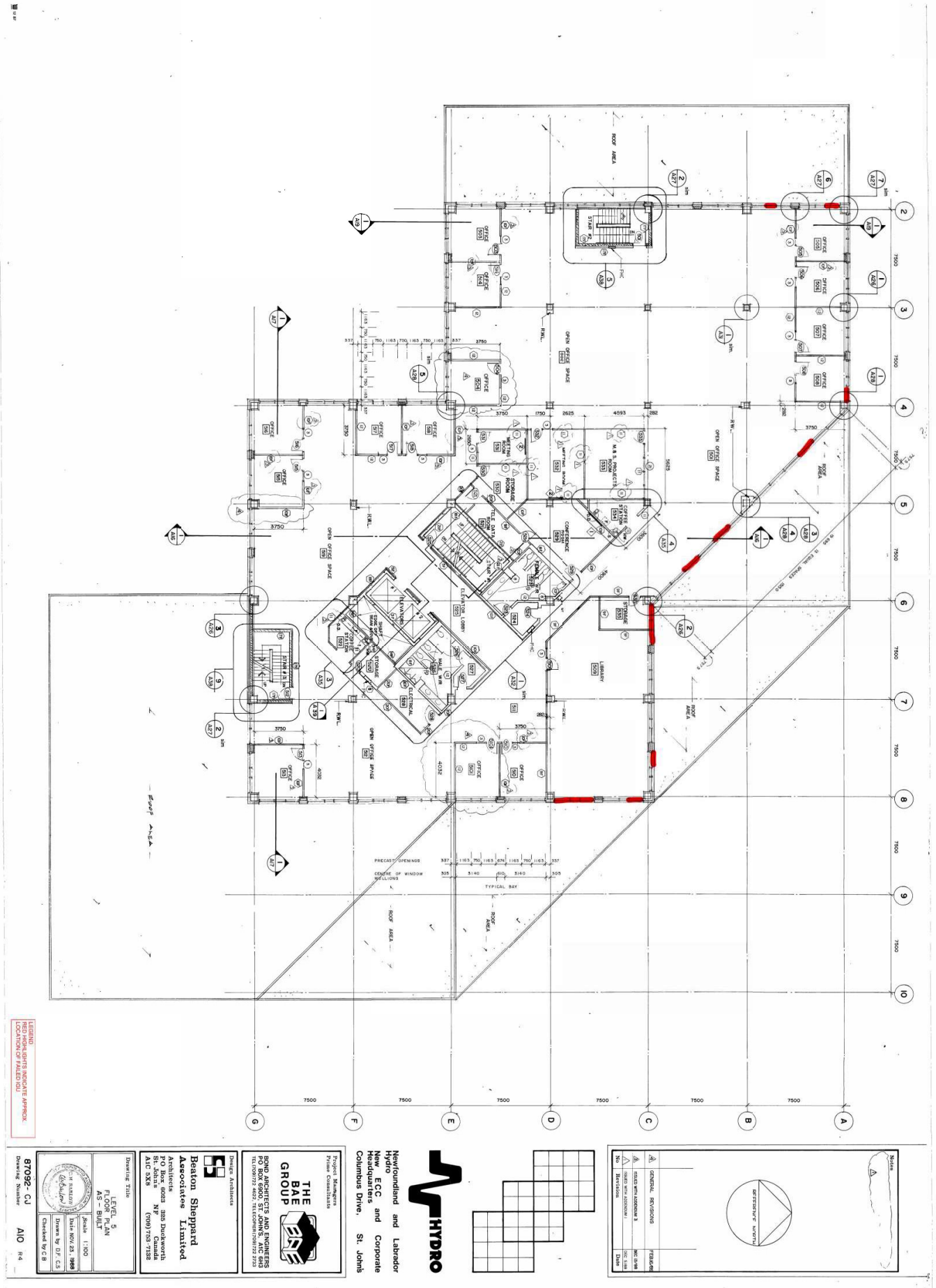
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Drawing Number

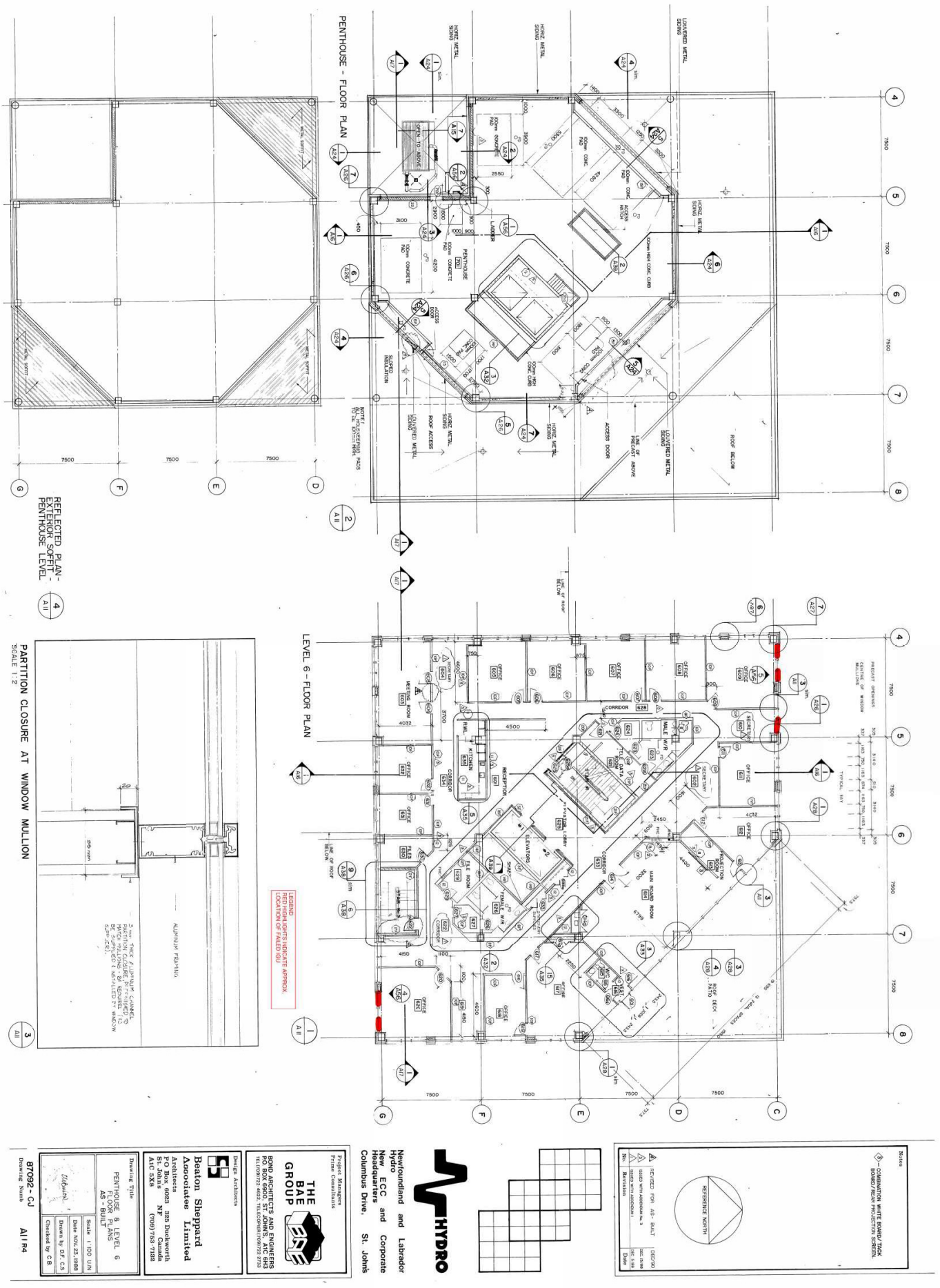
A7 R5


INTERIOR ELEVATION - MAIN LOBBY
FLOOR PLAN
Newfoundland and Labrador Hydro
New ECC and Corporate Headquarters
Columbus Drive, St. John's
HYDRO
THE BAE GROUP
Beaton Sheppard Associates Limited
BOND ARCHITECTS AND ENGINEERS
LEVEL 3 FLOOR PLAN AS - BUILT
87092 - CJ
A8 R5
REFERENCE: NORTH
REVISED FOR AS - BUILT
ISSUED WITH ADDENDUM 3
ISSUED WITH ADDENDUM 1

87092-
CJ-A9


87092
LEGEND
RED HIGHLIGHTS INDICATE APPROX. LOCATION OF FAILED GU
Newfoundland and Labrador Hydro
New ECC and Corporate Headquarters
Columbus Drive, St. Johns
THE BAE GROUP
Beaton Sheppard Associates Limited
Architects
P.O. Box 6003
St. John's, Nfld.
A1C 5X8
LEVEL 4 - FLOOR PLAN
AS-BUILT
87092 - CJ
A9


LEGEND
RED HIGHLIGHTS INDICATE APPROX. LOCATION OF FAILED IGU
Newfoundland and Labrador Hydro
New ECC and Corporate Headquarters
Columbus Drive, St. John's
HYDRO
THE BAE GROUP
Beaton Sheppard Associates Limited
Level 5 Floor Plan As - Built
87092- CJ
A10
Scale 1:100
Date NOV 23, 1988
Drawn by D.F. C.S
Checked by C.B


PENTHOUSE - FLOOR PLAN
REFLECTED PLAN - UNDERSIDE OF PENTHOUSE LEVEL
LEVEL 6 - FLOOR PLAN
PARTITION CLOSURE AT WINDOW MULLION
SCALE 1:2
LEGEND
RED HIGHLIGHTS INDICATE APPROX. LOCATION OF FAILED IGU
Beaton Shepard Associates Limited
THE BAE GROUP
BSHD ARCHITECTS AND ENGINEERS
Newfoundland and Labrador Hydro
New ECC and Corporate Headquarters
Columbus Drive, St. John's
PENTHOUSE & LEVEL 6 FLOOR PLANS AS - BUILT
87092 - CJ
A1 R4

Appendix C

Thermography Report (Exterior) - Hydro Building

Thermography Report (Interior) - Hydro Building

Locations

Canada

Vancouver, BC
Surrey, BC
Victoria, BC
Nanaimo, BC
Kelowna, BC

Calgary, AB
Edmonton, AB

Saskatoon, SK

Toronto, ON
Ottawa, ON
Kitchener, ON
Kingston, ON

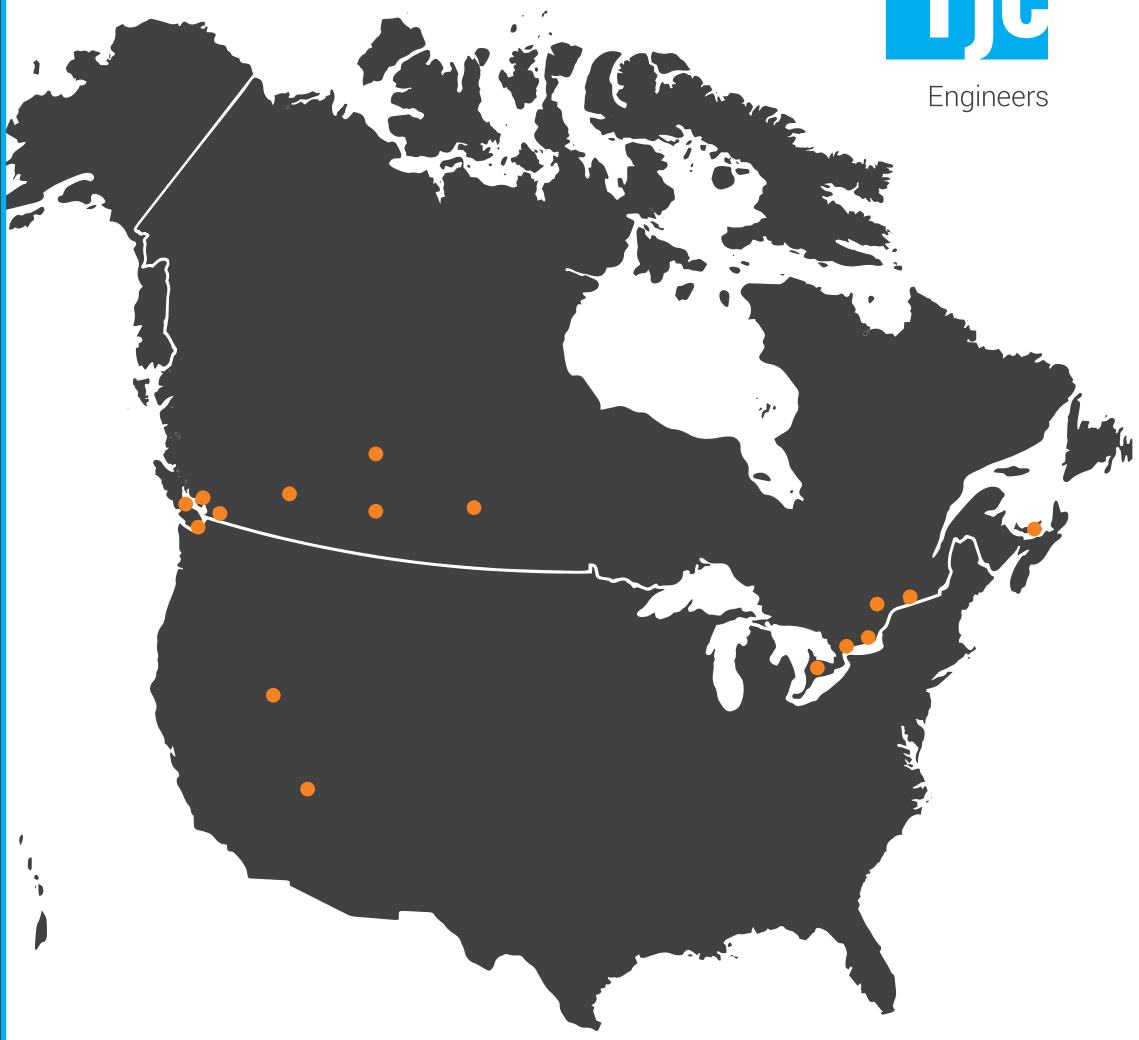
Montreal, QC

Stratford, PEI

USA

Las Vegas, NV
Reno, NV

rjc
Engineers





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Engineering Services

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- Building Envelope
- Cold-Formed Steel Design
- Condition Assessments
- Depreciation Reports & Reserve Fund Studies
- Façade Engineering
- Fall Protection & Travel Restraint
- Forensic Engineering
- Energy Modelling
- Heritage Conservation
- Parking Facility Design
- Parking Structure Restoration
- Pavement Rehabilitation
- Performance Assessment
- Post-Tensioned Concrete
- Prime Consulting
- Rendering & Interactive Visualization
- Roofs & Plaza Decks
- Seismic Risk Mitigation
- Specialty & Supplementary Engineering
- Structural Engineering
- Structural Glass Engineering
- Structural Restoration
- Sustainable Design
- Traffic Deck Protection & Replacement
- Waterproofing
- Wood Design

rjc.ca

Appendix C

Structural Condition Assessment – Ramea Diesel Plant (2026)





EXPLOITS ENGINEERING CONSULTANTS LIMITED
2 Mill Road, Grand Falls – Windsor, NL A2A 1B7
P: 709-489-9150 f: 709-489-9185

STRUCTURAL CONDITION ASSESSMENT

Date:	2026-06-01	EECL Job #:	25-068
Project:	Ramea Diesel Plant Structural Condition Assessment	Location:	Ramea, NL
Client:	Newfoundland and Labrador Hydro		

Introduction

On October 15th, 2025, Chris Sargent, P. Eng., representing Exploits Engineering Consultants Ltd. (EECL), accompanied by two employees of Burnt Bay Construction Ltd. (BBCL), visited the Newfoundland and Labrador Hydro (NLH) Diesel Generating plant in Ramea to perform a visual observation of the steel structure by removing the bottom portion of a representative sample of the siding panels. The objective was to collect information and document the condition of the structure and to make recommendations based on the conditions observed. The roof framing and assembly was not a part of this assessment.

Structural Condition Assessments are a visual observation of a structure, with the aim of:

1) identify the condition of the structural components, types of structural defects, signs of structural distress and deformation, and signs of material deterioration;
2) identify the loading on the structural components, deviations from their intended use, and possible overloading;
3) additions or alterations to the original structural components that may result in overloading or other adverse effects and;
4) non-structural components that may be affecting the structural systems (Professional Engineers Ontario, 2016).

This Structural Condition Assessment does not include any structural analysis of components or of the entire structure. Therefore, this report shall not be taken as a validation of the structural integrity of the structure as a whole, but just a general overview of the condition of the observed elements.

Background

EECL was retained by NLH to perform a Structural Condition Assessment of the walls of the building because of some poor conditions observed by NLH employees on site. There are places on the exterior of the building where holes have corroded through the siding, revealing the corrosion of the girts supporting it, along with a roof access ladder which has been taken out of service because the girts supporting it have corroded to the extent that the ladder is no longer safe to climb. NLH requested that EECL, along with a qualified contractor, visit the site to remove a representative number of siding panels around the perimeter of the building, to observe the structure behind and make recommendations based on the conditions observed.

EXPLOITS ENGINEERING CONSULTANTS LIMITED
2 Mill Road, Grand Falls – Windsor, NL A2A 1B7
P: 709-489-9150 f: 709-489-9185

Structural Components/Systems

The existing building consist of a pre-engineered steel building with main building frames at approximately 6100 mm (20 feet) on centre with horizontal girts supporting the siding and purlins supporting the metal roofing. It appears that the inside finishes are separated from the girts and are constructed of wood framing. The building sits on a concrete foundation with a slab-on-grade floor, which were not part of this observation.

Means and Methods

All observations are visual only. The employees of BBCL removed the screws in the siding up to approximately 3000 mm above grade to pull the bottom of the siding out to observe the structure behind. Some of the existing plastic hex head screws were deteriorated and difficult to remove and therefore were damaged in their removal. BBCL replaced them with new plastic hex head screws that they had brought with them. Approximately 16 m of siding on the north side of the building had a cable tray connected to the siding at approximately 1100 mm above the base, so the siding behind it could not be removed to observe the structure.

Observations

The observation of the structure was generally through the lens of looking for signs of damage, deterioration, deflections and/or deformations. Generally, deterioration was observed at the lower two (2) girts, at door jambs, and in the vicinity of other wall penetrations. Some of the building main steel frames have some deterioration, resulting in some loss of material, mostly on the south wall of the building which appears to receive the majority of the salt spray from the prevailing winds. There were no noted areas of deflection or deformation, other than the areas of severe deterioration at the girts. Along the 16 m of siding that was not removed for observation, it is anticipated that similar deterioration of the girts at the lower sections of the wall and at penetrations in the siding will exist.

1. Condition of Structural Components

a. Deflections – Deflections can be described as movement of a structural element as a result of loading on that element, which returns to its original position when the load is removed.
b. Deformations – Deformation can be described as permanent changes in the shape of structural elements and may be a result of overloading or permanent movement of structural elements.
c. Deteriorations – Deteriorations can take the form of corrosion, thinning of material, decay, etc. which can weaken structural elements.

2. Loading on the Structural Components

Intended loadings versus actual loadings – Nothing was observed to indicate that the structure is loaded in a manner that was not intended.

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3. Modification to Structural Components

Some locations appeared to have wood framing installed at the girts and jambs. It is not clear if this was to provide support for an observed deterioration, or for some other reason. Since the entire members could not be observed, we cannot comment on whether these additional wood members provide sufficient support where existing steel framing members have deteriorated.

4. Non-Structural Components

Non-structural components can affect the structure by adding unintended loads, taking loads when they should not be, or by preventing movement.

Fume hoods were observed at the east end of the building, which would impose loads on the building framing, but no adverse effects were noted due to this load. Of more concern was water infiltration at these locations which has caused deterioration of the steel components framed around the openings.

On the south side of the building there is a fume hood and a roof access ladder. At these locations, loading on the structure does not seem to be a problem, but water infiltration appears to have deteriorated the steel framing to the extent that it is no longer providing structural support.

On the north side of the building, approximately 16 m of the wall has penetrations, cable trays, etc., but the condition of the steel framing was not observed, as the siding could not be removed.

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Photos



Photo 1: First panel removed - north wall

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Photo 2: West wall



Photo 3: South wall - west end

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Photo 4: South wall



Photo 5: South wall - east end

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Photo 6: East wall



Photo 7: North wall - obstructions preventing observations

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Photo 8: Base of door jamb - north wall

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Photo 9: Base of door jamb - north wall

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Photo 10: Girt corroded through at front edge and back

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Photo 11: Girt corroded through completely

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Photo 12: Girt corroded through completely



Photo 13: Girt corroded at front flange

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Photo 14: Girt corroded through at front flange



Photo 15: Girt at northwest corner

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Photo 16: Corner column - delamination of material, loss of most of nut material



Photo 17: Corner column - delamination of flange, evidence of significant corrosion at this corner

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Photo 18: Jamb corroded through - nested wood framing may be adding support

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Photo 19: Wood framing at old overhead door opening

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Photo 20: Main building frame - loss of material at base

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Photo 21: Loss of material at girt connection to column

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Photo 22: Girt completely missing behind roof access ladder

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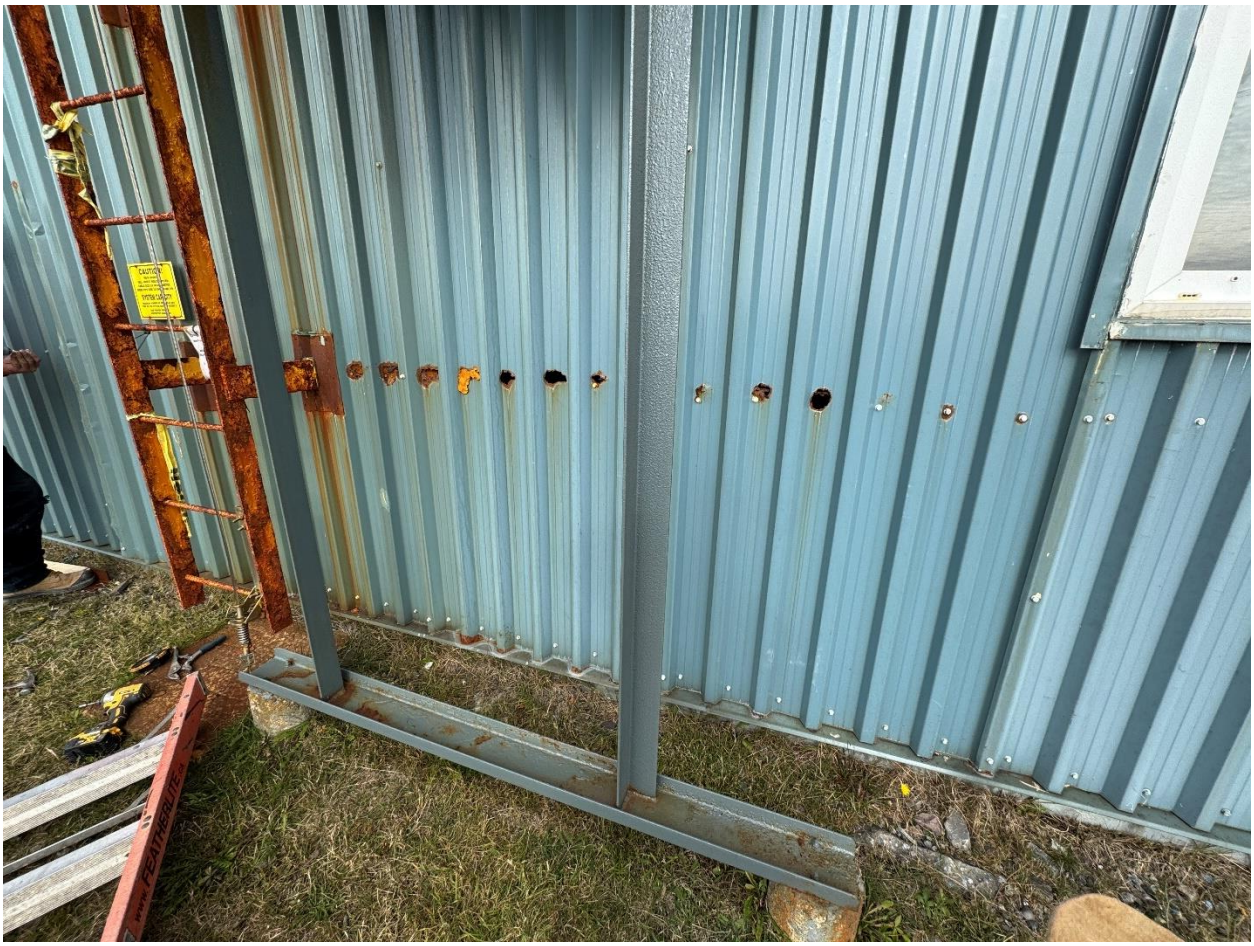


Photo 23: Siding deterioration at screw holes, girt missing

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Photo 24: Main building frame - base of column in fair condition

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Photo 25: Base of overhead door jamb



Photo 26: Girt connection at overhead door jamb

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Photo 27: Girt connection at overhead door jamb



Photo 28: Poor weatherproofing at fume hood

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Photo 29: Deterioration of siding

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Photo 30: Corner column in fair condition

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Photo 31: Hole in jamb

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Recommendations

Based on the conditions observed, to the extents of which the building elements were observable, it appears that deterioration of the building elements is generally located at the bottom two (2) girts of the walls and below, at wall penetrations, and at locations of prevailing wind and therefore salt spray. It is anticipated that similar condition of the girts is likely to exist along the 16 m of wall with a cable tray that could not be observed.

Based on the building location, it is assumed that the deterioration is mainly a result of its vicinity to the salt water. Any conditions related to the wall assembly and heat produced by the building, that may result in condensation and water accumulation in the wall cavity that may be contributing to the steel deterioration are beyond the scope of this report.

Not accounting for any support that may be added by supplemental wood framing at openings or for support of interior finishes, deteriorated steel girts and jambs are no longer providing sufficient support for the metal siding. This may be a serious issue in the event of a severe wind event, as siding may become dislodged from the building, which could cause additional damage to the interior of the building or to people and property adjacent to the building.

Deteriorated siding, girts, jambs, etc. and connections to the main building steel frames and/or foundations should be replaced and properly secured. Consideration for the severe salt environment should be considered, as typical pre-engineered steel building siding and roofing may not be warrantied when located within a certain distance to salt water. Additional coatings to prevent salt infiltration and alternate fasteners, such as stainless steel, should be considered to extend the life of components and the building as a whole. Removal of the siding may uncover additional problems with the girts, steel frames or other components, which may have to be addressed at the time of the repairs.

Main building steel columns should be cleaned and repaired by adding weld material or steel plates, depending on the severity of the loss of material. Nuts at the column base anchor rods may need to be removed and replaced. Additional protection of the bottom portions of the columns such as painting with asphaltic type paint or other approved protection for salt rich environments should be considered.

Replacing the siding, girts and framing around the wall penetrations is considered a priority, but given the extents of the work required to replace these components, all repairs should be completed at the same time, given the complexity of coordinating the work due to the project location, and the likelihood that additional problems are likely to be uncovered when full siding panels, insulation, etc. are removed.

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Notes

All observations are visual only and are limited to the exposed and accessible areas. The opinions and recommendations given above are based on the conditions assessed at the time of the observation. EECL reserves the right to modify or change any of these opinions in the event that other areas of construction are made accessible for observation or other documents and information about the structure become available.

The recommendations of this report do not constitute a designed solution but are intended to provide direction for a design professional or experienced contractor to prepare a designed solution for the issues noted.

This report does not constitute a construction inspection of the building for compliance with the construction documents or governing regulations and building codes.

If you have any questions or concerns, please feel free to contact me.

Sincerely yours,



Chris Sargent, P. Eng.

Structural Engineer

csargent@exploitsengineering.ca

REFERENCES

Professional Engineers Ontario. (2016). *Structural Condition Assessments of Existing Buildings and Designated Structures Guideline.* Toronto, ON: Professional Engineers Ontario.

Appendix D

Building and Infrastructure Condition Assessment – Stephenville Office Facility (2018)

newfoundland labrador hydro

Building and Infrastructure Condition Assessment Stephenville Office Facilty

(Stephenville, NL)



173034.00 ● Final Report ● February 2018

ISO 9001
Registered Company

Prepared for:

nalcor energy

Prepared by:

CBCL LIMITED
Consulting Engineers

Final Report	Paul Sceviour	Feb 12, 2018	Paul Sceviour
Draft Report	Paul Sceviour	Dec 15, 2017	Paul Sceviour
Issue or Revision	***Reviewed By:***	***Date***	***Issued By:***

CBCL LIMITED
Consulting Engineers

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REGISTERED PROFESSIONAL ENGINEER
PAUL SCEVIOUR
SIGNATURE
FEB 12, 2018
DATE
NEWFOUNDLAND & LABRADOR

ISO 9001
Registered Company

CBCL Project No 173034.00

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CHAPTER 1 REPORT OVERVIEW

1.1 RFP and Consultant Group

In March 2017, the Newfoundland and Labrador Hydro (referred to as the "NLH" hereafter) issued a Request for Proposals to undertake the building and infrastructure condition assessments for various line depots and office facilities in the province. The sites included:

- Line Depots
  - Burgeo
- Office Facilities
  - Stephenville Office Facility
  - St. Anthony Office Facility

CBCL Limited responded to the request on April 3, 2017, and was subsequently awarded the project on May 3, 2017.

The consultant team that performed this assessment consisted of a multi-disciplined engineering team with CBCL Limited performing structural, mechanical, electrical, and environmental tasks, and Glenn Barnes Architecture Inc. performing architectural and functional programming tasks.

This report contains the results of those exercises and provides our professional assessments, recommendations as to the current condition, suitability of use, required code upgrades, recommended upgrades, recommendations to suit future needs, and opinion of probable construction cost for recommendations.

1.2 Scope of Work

The Request for Proposals document contained the terms of reference which outlined the objectives and scope of the project. The assessment has several objectives:

- to review the general condition of the building and site infrastructure including architectural, structural, mechanical, electrical, and environmental;
- provide recommendations of renovations to continue operating existing facilities in view of present and future needs, and

- provide preliminary functional programming based on the client current needs (for storage, operations, etc.) and future needs to determine the most efficient uses of the assessed facilities.

1.3 Site Audits

Site audits were carried out during the week of July 24th. Prior to the site work, CBCL requested any available plans and prior documents or information on the facilities. Limited information was available so the bulk of the information contained in this report was obtained from onsite review and from information provided by on site personnel. Upon arriving at the various sites the consultant team checked in with site personnel and undertook site specific safety orientation were required.

1.3.1 Office Building



The 445m^2 single level on grade steel frame building appears to have been originally constructed circa 1942 by the US Air Force as part of Harmon Air Force Base. Extensive modification and upgrades have taken place since its original construction. The building currently houses Newfoundland and Labrador Hydro's administration, staff training, small warehouse and three workshops namely; Protection and Control, Transmission, and Terminals shops. The building has a contemporary sloped hip roof with asphalt shingles which was added in recent years and exterior walls cladding is of vertical pre-painted steel siding. Windows are fixed over projected aluminum with double hermetically sealed glazing, which are contemporary and in good condition. The main entrance door is glazed aluminum in aluminum frame, other exterior doors are steel in pressed steel frames. The exterior envelope appears to have been upgraded in recent years and is in excellent condition.

Interiors consist of demountable type vinyl wallcovering, finished drywall partitions with vinyl battens on metal stud, some masonry partitions (in the warehouse and corridor separating the shops wing from the remainder of the building), and suspended acoustical tile ceilings with the exception of the warehouse which has an exposed steel original roof structure. Flooring is generally vinyl tile with carpeting in the meeting/training room, all are in good condition.

The building is not accessible to persons with mobility challenges and due to its age would not be required to meet the Accessibility Act.

Shops appear to be undersized as reported by staff and as observed, building expansion is recommended. *(Refer to conceptual floor plan drawing.*)

Site utilities include municipal water and sanitary sewer. The site itself is primarily asphalt covered at the higher elevations where the buildings are located with the remainder gravel. The site generally slopes to lower elevations to the north side of the site. The depot yard is fully fenced with the south and east sides of the office building forming part of the perimeter.

1.3.2 Garage



The building is a single level on grade pre-engineered steel structure of 166m^2 area with insulated envelope and bare interior finish. The space is principally a three bay repair garage. Ancillary rooms include; washroom, office, lunch, parts, storage and two small low ceiling storage lofts. Interior rooms are primarily masonry construction. A service pit is located in the center bay of the building. The building is estimated to be 20-25 years of age. It is in good condition.

Site utilities include a water supply and sanitary sewer connected to the municipal system.

1.3.3 Warehouse Building



The building is a single level on grade pre -engineered steel structure of 134m^2 area. It is sub-divided into three rooms each with metal demising partitioning walls, two rooms have sectional overhead doors plus a single swing steel personnel door. The third room has a pair of steel swing doors. Each room is used for line crew equipment storage. The roof is low slope gable metal clad. Windows are steel with corroded steel security screening. Personnel doors are metal in pressed steel frames with commercial hardware. The building exterior should be painted. The building is in better condition than it first appears. Its age appears to be 30 plus years.

The Storage Building does not have any site services.

1.3.4 Storage Shed



The building is a single level on grade pre-engineered loadbearing steel skinned structure by Armco. The 22m^2 building is comprised of a single storage room for tire and other storage. Galvanized steel walls and roof cladding are double skinned with an approximately 25 mm thick glass fibre insulation sandwich. The roof is a low slope standing seam gable style sheet steel design. The ceiling is metal and there is a vented attic with gable end vents. The door is a single swing type steel in pressed steel frame. An unused side door exists. The building is used for storage.

The Storage Shed does not have any site services.

1.4 Findings and Recommendations

1.4.1 Office Building Findings

The building is in good condition but upgrades should be considered in the next 3-5 years. Some codes upgrading work is also required.

1.4.2 Office Building Recommendations

Near term recommendations that should be planned to be undertaken within the next two years have been put forward for architectural, structural, site, mechanical, electrical, and environmental and are summarized as follows.

Architectural:

- Enclose janitorial supplies in 60 minute fire rated room.
- Continue main corridor through existing kitchen to create continuous dedicated exit path to eliminate current dead ending.
- Eliminate existing lean to flammable storage shed at rear of building.
- Replace male washroom and lunch flooring.
- Removed loose stored items from electrical and data rooms.
- Add upper area attic vents.
- Add attic access hatches.

Structural:

- Access should be provided to the hip-truss roof attic in order to properly assess the condition of the roof structure.

Site/Civil:

- Regrade east and west access roads to lower yard.
- Make repairs to site fencing.

Mechanical:

- Revise trap piping on Male Washroom lavatory to be a P trap.
- Revise clothes washer standpipe to include a trap.
- Replace corroded and uneven sewer cleanout in Women's Washroom.
- Insulate remainder of accessible copper domestic water piping.
- Raise Female Washroom hot water tank setpoint temperature to between 50°C and 60°C.
- Replace Female Washroom hot water tank and pipe relief discharge piping to code.
- Provide an electronic hands free flush valve on the urinal.
- Have an inspection/testing/routine maintenance service call for the split air conditioning system completed.
- Have an inspection/testing/routine maintenance service call for the humidification system completed.
- Replace Male Washroom exhaust fan with a higher capacity unit. Not required if a heat recovery system is installed.
- Update time, day, and schedules on HVAC system master controller.

- Provide a heat recovery system to service areas of the building not provided with ventilation.

Electrical:

- Consider installation of new fire alarm system panel with detectors and alarm devices. Reuse existing fire alarm pull stations.
- Remove the materials stored in the electrical room and install warning sign on electrical room door "Electrical Room – No storage permitted".
- Install the panel cover on the panelboard in the space above the electrical room.
- Relocate the communication rack installed in front of the main disconnect to provide a 1 m working space.
- Replace missing acrylic lenses on wraparound fluorescent lighting fixtures.
- Replace both outdoor standard duplex receptacles and faceplates with new GFCI receptacles c/w weatherproof faceplates.

Environmental:

- Provide a rated vented safety cabinet in the Warehouse for storage of flammable/combustible liquids.
- Indoor air quality should be addressed as per the recommendation in the mechanical section of this report.
- The presence of asbestos and potentially lead containing materials are to be made aware to anyone undertaking work that may disturb these materials.
- Ozone depleting substances (refrigerants) should be properly recovered prior to disposing of equipment.
- Stained soil in the depot yard should be removed and properly disposed of.
- Stored propane cylinders should be moved to an outdoor storage area.

Mid-term recommendations that should be planned to be done in the next 3-10 years are architectural, mechanical, and electrical and are summarized as follows.

Architectural:

- Expand the building to increase the sizes of the shops. *(Refer to suggested conceptual design floor plan.)*

Mechanical:

- Replace copper domestic water piping.
- Replace hot water tank and provide hinged door on tank enclosure.

Electrical:

- Panels A, B, and the hallway loadcenters should be replaced within the next five (5) years.
- Replace T12 fluorescent light fixtures with T8 or LED fixtures.
- Replace batteries in emergency lighting units.

1.4.3 Garage Findings

The building is in good condition with minor upgrades recommended as well as some code issues.

1.4.4 Garage Recommendations

Near term recommendations that should be planned to be undertaken within the next two years have been put forward for architectural, mechanical, electrical, and environmental and are summarized as follows.

Architectural:

- Modify service pit to meet code by adding guard rails, second exit stair, explosion proof fixtures, or delete it and infill the pit.
- Re-paint interiors as well as exterior doors and frames.
- Replace main entry door threshold.
- Sand and re-paint corroded cladding.
- Clean and wax tile floors. Replace washroom and kitchen flooring.
- Paint steel liner panel in washroom.

Mechanical:

- Replace existing service pit sump pump with one rated for hazardous location including associated wiring.
- Revise the venting on the oil interceptor to be code compliant.
- Provide a backflow preventer on the water entrance to the building.
- Insulate accessible domestic hot and cold water piping.
- Index the lavatory cold water faucet handle.
- Replace hot water tank and provide with drain pan.
- Increase the hot water temperature setpoint on the hot water tank to between 50°C and 60°C.
- Repair or replace the inoperative south end rooftop exhaust fan.
- Provide a heat recovery unit to meet minimum ventilation requirements.
- Replace the service pit exhaust fan with one of non-spark construction and suitable for conveyance of combustible gases. Provide visual system operation proving light.
- Increase general exhaust rates if required and provide tempered make-up air system for general exhaust capacity and pit and welding exhaust systems.
- Upgrade gas detection system with additional sensors, visual and audible alarm indication, and interlock with exhaust and make-up air systems.
- Provide nitrogen dioxide gas detection system if diesel vehicles are serviced in the garage.
- Provide service visit by qualified gas detection system representative to assess system and calibrate existing sensor.

Electrical:

- Provide filler plates on spare breaker spaces in power panels.
- Replace one (1) more than twenty (20) year old emergency lighting unit and one (1) old Exit sign.
- Provide explosion proof wiring in the service pit if it will be kept functional.
- Consider connection the existing pull station to the recommended new fire alarm panel for the office building. Install new fire alarm system detectors and alarm devices as required.

Environmental:

- Stored propane and acetylene cylinders should be moved to an outdoor storage area.

Mid-term recommendations that should be planned to be done in the next 3-10 years are architectural and electrical and are summarized as follows.

Architectural:

- Replace overhead doors.

Electrical:

- Panels should be replaced within the next ten (10) years.
- Replace T12 fluorescent light fixtures with T8 or LED fixtures.

1.4.5 Warehouse Building Findings

The building is in fair condition, requiring exterior envelope upgrades and code issues to be addressed.

1.4.6 Warehouse Building Recommendations

Near term recommendations that should be planned to be undertaken within the next two years have been put forward for architectural, electrical, and environmental and are summarized as follows.

Architectural:

- Replace corroded siding, fascia, gutters windows and window screens.
- Paint cladding and doors.
- Add fire rated interior finish, and doors proximate to the main building due to limiting distance issues.

Electrical:

- Replace the existing incandescent lighting fixtures with T8 fluorescent or LED lighting fixtures.
- Replace the old receptacles, outlet boxes and faceplates.
- Install emergency lighting units in all rooms.

Environmental:

- Stored propane cylinders should be moved to an outdoor storage area.

Mid-term recommendations that should be planned to be done in the next 3-10 years are architectural and electrical and are summarized as follows.

Architectural:

- Replace overhead doors.

Electrical:

- Replace T12 lighting with T8 or LED.

1.4.7 Storage Shed Findings

The building is in fair condition, requiring exterior envelope upgrades and minor electrical issues to be addressed.

1.4.8 Storage Shed Recommendations

Near term recommendations that should be planned to be undertaken within the next two years have been put forward for mechanical and electrical and are summarized as follows.

Mechanical:

- The existing fire extinguisher should be replaced with one rated 4A80BC.

Electrical:

- Install an emergency lighting unit inside the storage shed.
- Replace the outdoor GFCI receptacle including the weatherproof faceplate.

Mid-term recommendations that should be planned to be done in the next 3-10 years are architectural and are summarized as follows.

Architectural:

- Replace existing galvanized steel roof panels.
- Paint door and frame.

1.4.9 Stephenville Pole Ramps and Equipment Platforms

Near term recommendations that should be planned to be undertaken within the next two years have been put forward for the yard pole ramps and equipment platforms are summarized as follows.

Structural

- Equipment storage platforms should be replaced.

CHAPTER 2 FACILITY AUDITS

2.1 Office Building

2.1.1 Architectural Assessment

The 445m^2 single level on grade steel frame building appears to have been originally constructed circa 1942 by the US Air Force as part of Harmon Air Force Base. Extensive modification and upgrades have taken place since its original construction. The building currently houses Newfoundland and Labrador Hydro's administration, staff training, small warehouse and three workshops namely; Protection and Control, Transmission, and Terminals shops. The building has a contemporary sloped hip roof with asphalt shingles which was added in recent years and exterior walls cladding is of vertical pre-painted steel siding. Windows are fixed over projected aluminum with double hermetically sealed glazing, which are contemporary and in good condition. The main entrance door is glazed aluminum in aluminum frame, other exterior doors are steel in pressed steel frames. The exterior envelope appears to have been upgraded in recent years and is in excellent condition.

Interiors consist of demountable type vinyl wallcovering, finished drywall partitions with vinyl battens on metal stud, some masonry partitions (in the warehouse and corridor separating the shops wing from the remainder of the building), and suspended acoustical tile ceilings with the exception of the warehouse which has an exposed steel original roof structure. Flooring is generally vinyl tile with carpeting in the meeting/training room, all are in good condition.

The building is not accessible to persons with mobility challenges and due to its age would not be required to meet the Accessibility Act.

Shops appear to be undersized as reported by staff and as observed, building expansion is recommended. *(Refer to conceptual floor plan drawing.*)

2.1.1.1 BUILDING EXTERIOR ENVELOPE

Exterior walls are clad with pre-painted vertical steel siding of contemporary vintage. The condition is excellent. Given the deep recesses at windows and doors we assume that thermal insulation was added under the siding at the time it was applied to the original building.

The roof is a hip style sloped roof with asphalt shingle finish which appears in good condition however attic ventilation appears to be limited to perforated vinyl soffits without ridge venting as required by code. Access to attics is limited, with the building appearing to include both the original flat roof and the new sloped roof. Improved attic access to code is recommended. Facias are clad in pre-painted aluminum with vented vinyl soffit. Staff advised that the hip roof was added in 1991, with asphalt shingles having been replaced 2 years ago. One leak remains in the centre right exterior office. Attic access is limited and did not provide adequate ability to confirm roof construction, insulation, and ventilation etc. from the inside of the building.

Exterior doors include glazed aluminum in aluminum frame at the main public entrance with others being commercial metal in pressed steel frames with commercial hardware.

Windows are contemporary and are aluminum in fixed over projected styles. Glazing is double hermetically sealed and is in good condition.

2.1.1.2 Building Interior

Partitions are steel stud with demountable vinyl wall covering clad drywall with removable battens. Shops partitions are stud and drywall with the dividing corridor being masonry.

Ceilings are suspended acoustical tile, with the warehouse having exposed roof structure.

Flooring is generally vinyl tile with carpeting in the meeting room/training room and painted concrete in the shops, which is generally in good condition with the exception of the lunch room and male washroom which should be replaced.

Interior doors are generally hollow core wood with stain finish in demountable style metal frames. Hardware is residential. Doors are in good condition.

Millwork in the kitchen is oak and is in good condition with re-finishing recommended. Appliances are in good condition. Washroom vanities, toilet stalls and accessories are in good condition. Male washroom flooring needs replacement and the room needs re-painting.

Both the electrical and data rooms have extensive quantities of loose items of storage. These items should be removed to reduce flammable fuel sources as well as to allow heat to circulate and permit clear access to equipment.

Janitorial supplies are stored on open shelves in the warehouse. They shall be stored in a 60-minute fire rated room to meet NBCC.

Given the fact that the shops cannot be used as storage garages the 90 minute fire rating is not required in this building. They are considered to be workshops which are not required to have a fire rating or fire separation from office areas.

2.1.1.3 BUILDING CODE

The building is classified as F-3 – Low Hazard Industrial and "D" Offices by the NBCC 2010.

The building is generally in reasonable compliance to code. There are some modifications required including door swings, elimination of dead ending, hardware, fire rating and/or removal of the attached flammable storage lean to shed.

2.1.1.4 ACCESSIBILITY

The building is not accessible to persons with mobility challenges. Due to its age (pre-dating 1981 and with cumulative renovations not exceeding 50% of its replacement cost) it is not required to meet the Accessibility Act.

2.1.1.5 SELECTED NBCC 2010/ LSC 101 REQUIREMENTS

The following provides an overview of several National Building Code 2010/Life Safety Code NFPA 101 requirements and applicable sections for this facility.

Requirements	**Compliance / Action**
1) <u>Building Occupancy</u> Group F-3 – Low Hazard Industrial Group D – Business and Person Services – Office Areas *NBCC A-3.1.3.1*	Compliant
2) <u>Group D, Up To Two Storeys</u> 1. A building classified as Group D, is permitted to conform to Sentence (2) provided a. It is not more than 2 storeys in building height, and b. It has a building area not more than 1000 m^2 when facing 2 streets. 2. The building referred to in Sentence (1) is permitted to be of combustible construction or non-combustible construction used singly or in combination, and a. Floor assemblies shall be fire separations and, if of combustible construction, shall have a fire resistance rating not less than 45 minutes, and i) Have a fire resistance rating not less than 45 minutes, and ii) be of combustible construction. *NBCC 3.2.2.50*	Multiple Occupancy Group D – Offices Group F-3 – Low Hazard Industrial Group D is the most restrictive, therefore governs. Compliant
3) <u>Occupant Load (Based on LSC)</u> Group F3 - Low Hazard Industrial: 137 m^2/46 m^2 per person = 3 persons Group D – Offices: 154 m^2/9.3 m^2 per person = 17 Total Occupant Load = 20 persons (Service rooms, storage, circulation and washrooms are excluded)	Compliant
4) Exit Capacity	Suites are compliant

Requirements	Compliance / Action
The maximum size of rooms or suites with one exit are as follows: Group D – 200 m^2 with a 25 metre travel distance to the egress door. Group F-3 – 200 m^2 with a 15 metre travel distance to the egress door. *NBCC 3.4.2.1.A*	
5) Except if exits are located along the perimeter of the floor area and each main aisle in the floor area leads directly to an exit, the travel distance may be 60 metres maximum. NBCC 3.4.2.5	Compliant
6) The minimum width of a public corridor shall be 1100 mm. *NBCC 3.3.1.9*	Compliant
7) Travel Distance shall be maximum of 30 metres. *NBCC 3.4.2.5*	Travel distance compliant
8) Exit capacity persons x 6.1 mm per person = 122 mm *NBCC 3.4.3.2*	Compliant (with the exception of dead ending at the main corridor).
9) Exits shall be separated from the remainder of the building by a fire separation having a fire resistance rating of not less than 45 minutes. *NBCC 3.4.4.1*	N/A
10) Electrical rooms, if housing oil type transformers, shall have a fire resistance rating of not less than 60 minutes. *NBCC 3.6.2.1*	N/A
11) Washroom Fixture Calculation Group F-3 - 3 persons Group D - 17 persons: 1 male, 1 female *NBCC 3.7.2.2*	Compliant
12) The building need not be designed to meet the NL Accessibility Act requirements due to its age.	
13) In a building with more than one major occupancy, the requirement of the most stringent occupancy shall apply to the entire building.	Group D governs
14) Rooms for storage of janitorial supplies shall be constructed with a 60 minute fire rated fire separation. *NBCC 3.3.21.2*	Non-compliant Fire rated room required.
15) Limiting distance	Compliant

2.1.1.6 Conclusions and Recommendations

The building is in generally good condition with minor maintenance and codes upgrading required.

The following short term recommendations are made:

- Enclose janitorial supplies in 60 minute fire rated rooms.
- Continue main corridor through existing kitchen to create continuous dedicated exit path to eliminate current dead ending.

- Eliminate existing lean to flammable storage shed at rear of building.
- Replace male washroom and lunch flooring.
- Removed loose stored items from electrical/data room.
- Add upper area attic vents.
- Add attic access hatches.

The following mid- term recommendations are made:

- Expand the building to increase the sizes of the shops. *(Refer to suggested conceptual design floor plan.)*

2.1.2 Structural Assessment

The main depot building at the Stephenville Depot is a pre-engineered steel building supported on a concrete foundation wall. The building can be split up into the office area, the work shop/ warehouse area.

2.1.2.1 Foundation and Floor Systems

The building foundation system consists of a perimeter foundation wall with interior spread footings underneath the columns. At the maximum point there is only approximately 150 mm of the foundation wall that is exposed and in many areas none the wall can be seen. Therefore, a complete assessment of its condition could not be determined. The slight portions that were exposed appeared to be in good condition.

On the interior the slab-on-grade is approximately 150 mm below the top of the spread footings. The footings are coated in safety yellow paint and appear to be in good condition. There were no deficiencies observed other than that they posed a tripping hazard to workers walking past them. As they are a part of the building structure they must remain.

The interior ground floor of the office building consists of a concrete slab on grade. The office portions slab was concealed by floor and carpet tile, and therefore could not be inspected. The concrete slabs that were visible appear to be in good condition. There was some minor abrasions but otherwise free of any cracking.

2.1.2.2 Roof Systems

The main building has a hip-truss roof system with asphalt shingles. The original roof appears to have been a flat roof framed with steel beams and decking. The new hip roof appears to be an add-on over top of the existing steel roof. There is no access to the inside of the new hip-truss attic space to inspect the trusses. Access above the ceiling tiles is limited to the steel beams and covered with a liner panel obscuring any view into the attic. The steel beams were all visible and in excellent condition.

It is unclear how the trusses are supported or attached. Typically, on a building of this size, the roof trusses will span between the exterior walls. However, in this case the original exterior beams were not designed to receive half of the tributary width of the roof because there were two lines on

interior beams/columns. It would be prudent to know if the hip-trusses are also supported on these interior beam lines. A follow-up inspection should be conducted with access into the attic space to determine how the trusses are supported.

An attached lean to used for storage has utilizes wood rafter roof framing. The rafters are generally in good condition however water staining was observed on them and the roof plywood sheeting.

2.1.2.3 Framing Systems

The building is constructed using a traditional stick-built steel framing system. There are four rows of steel wide flange beams supported on wide-flange steel columns. Each framing bay is divided by one wide flange beam. All of the steel that was observed was in very good condition. The wall structural system was not exposed but the cladding appeared to be in good shape which would suggest that there is no overstress on the girt system.

The attached lean to has wood stud framing with plywood sheeting. No rot or other issues were identified.

2.1.2.4 Conclusions and Recommendations

Overall the main building is in good condition. Based on the observations made during the inspection the following is recommended.

- Access should be provided to the hip roof attic space to complete a full structural inspection.

2.1.3 Mechanical Assessment

2.1.3.1 Plumbing – Drainage, Waste, and Venting

The office facility is equipped with one Male Washroom, one Female Washroom, and a Lunchroom. A clothes washer and dryer are provided in the Male Washroom.

Waste and vent piping in the building is primarily ABS (see Mechanical photo 1), though some copper vent piping was observed above the Female Washroom (See Mechanical photo 2). It was observed that one of the Male Washroom lavatories is not properly trapped. It effectively utilizes an S trap and not a P trap as required by code (See Mechanical photo 3). The clothes washer drain standpipe is not provided with a trap as required (See Mechanical photo 4). The washer hose appears to be sealed to the standpipe.

A cleanout located in the Female Washroom has a steel cover plate that is corroded and is not flush with the surface creating a trip hazard (See Mechanical photo 5). It is recommended that this cover be replaced.

Condensate drains from indoor HVAC equipment was observed to be copper.

No floor drains were observed in the facility.

2.1.3.2 PLUMBING – DOMESTIC WATER PIPING AND SYSTEMS

Domestic water for the facility is provided from municipal services. A water entrance into the building could not be located though a curb stop was observed on the east side of the building.

The domestic water piping is copper throughout the facility. Domestic water piping is partially insulated with preformed pipe insulation and canvas jacketing (see Mechanical photo 6). Some areas of the piping are not insulated (see Mechanical photo 7).

The age of the domestic water piping could not be determined. It is likely a mixture of original and newer piping provided in renovations over the building history. Any original piping has exceeded it's life expectancy. It is recommended that all copper piping be replaced in the mid-term.

Domestic hot water for the Male Washroom is produced in an electric hot water tank located in a sealed enclosure in the Male Washroom (see Mechanical photo 8). A partial view of the rear of the tank was possible (see Mechanical photo 4). The enclosure was not accessible so data on the hot water tank or of its piping arrangement is up to code could not be fully obtained. Due to the relatively short lifespan of these units it would be prudent to recommend replacing it in the mid-term. The enclosure should also be fitted with a hinged door to allow the tank to be inspected and serviced if required. Measured hot water temperature was 52.2°C which is satisfactory.

The Female Washroom is provided with its own hot water tank located in the corner of the washroom (see Mechanical photo 9). The tank is a 36 Litre (10 US Gal) electric unit with a 3 kW element. The tank is a Rheem model number RE10. The hot water heater appeared to work properly. The tank was manufactured in 2013 based on its serial number. Based on its serial number the tank was manufactured in 2003 resulting in it exceeding its life expectancy. The tank should be replaced in the near term. The hot water tank temperature/pressure relief piping is not installed to code with too many elbows and it being piped into the adjacent wall without a visible air gap. Hot water temperature was measured to be 47.6°C. The water temperature setpoint should be raised to between 50°C and 60°C to control the formation of legionella bacteria.

2.1.3.3 PLUMBING – FIXTURES

As mentioned previously the facility has two washrooms, and a lunch room. Water closets are generally commercial grade floor mounted tank type (see Mechanical photos 10 and 11). Water closets were generally in good condition.

The one urinal is a wall hung commercial grade vitreous china unit with a flush tank (see Mechanical photo 12). The urinal is in good conditions with no issues noted. It is recommended that the flush tank be removed and replaced with a hands free electronic flush valve.

Washroom lavatories are drop in countertop type (see Mechanical photos 13 and 14). Lavatory faucets were two handle residential grade. Lavatories were in good condition with no issues noted.

The Lunch Room sink is a single bowl stainless steel type. Sink faucets are residential grade two handle type. Sinks were in good condition with no issues noted.

2.1.3.4 HVAC – Air Handling Systems

The facility is provided with minimal air handling systems. The office area is provided with a built up system with cooling and humidification as described below. Exhaust fans are present in washrooms and the lunch room.

The main office area is provided with a split air conditioning system. The condenser is located outdoors on the north side of the office area and the evaporator is an indoor air handler unit located in the ceiling above the Male Washroom. The condenser is manufactured by Carrier, however its nameplate information was so faded that specific model information could not be read (see Mechanical photo 15). The indoor air handler unit is a Carrier model 42BHC20 rated for 5 tons of cooling capacity (see Mechanical photo 16). The units are believed to be manufactured in 2005 and utilize R22 refrigerant. This system is provided with supply ducting throughout this office area. A return air fan (see Mechanical photo 17) located above the Male Washroom ceiling takes air from ducted returns and flows a portion to the indoor unit and expels a portion to the outside through an exhaust hood. Supply ducting, outside air ducting, and exhaust air ducting is insulated with foil faced blanket type insulation. Return ductwork is not insulated. At 12 years of age this system should have 5 to 10 years of life remaining. The system outside air intake and exhaust air hoods are located on the north side of the building (see Mechanical photo 18). It should be noted that access to the indoor unit and return fan is very difficult due to its location over the washroom.

Downstream of the indoor air handler is an electric duct heater which tempers the air in non-cooling mode when required (see Mechanical photo 16). The duct heater is a Thermolec model SC-CTPBX with 26 kW capacity. The discharge temperature of the duct heater is controlled by a duct temperature sensor and thermostat located off the Male Washroom near the washer/dryer.

Air distribution is through bypass type terminal units and square cone diffusers and return air grilles into the ceiling cavity (see Mechanical photo 19). The air distribution system appeared to be in good condition. The terminal units are controlled by zone thermostats which control the airflow to the space to maintain space temperature and also control the space baseboard heat.

A master controller is located in the alcove off of the Male Washroom which turns the systems fans on and off, controls the outdoor condenser cooling stage, and enables/disables the duct heater operation (see Mechanical photo 20). It was observed on site that the master controller settings were not properly set including the time and day. The controller should be properly set as this system is intended to provide ventilation air to this part of the building and should operate continuously during occupied periods.

The system is provided with an electric steam humidification system to maintain proper humidity levels in winter conditions. The humidifier was manufactured by DriSteam (see Mechanical photo 21). It is a model VM99-10 and has a steam generation capacity of 13.6 kg/hr. Based on the age of this unit it should have a remaining expected lifespan of 10 to 15 years. Steam from the unit is injected into the supply air ductwork downstream of the indoor air handling unit. Humidifier output

is controlled by a humidity sensor located in the return air ductwork. Regular inspection and maintenance should be performed on this unit.

The Lunch Room is provided with a domestic style range hood ducted to the outside.

Washrooms are provided with residential grade ceiling mounted exhaust fans ducted to the outside. The Male Washroom fan did not operate (see Mechanical photo 22). Based on the type of fan present it is unlikely that this fan is of sufficient capacity for this washroom.

2.1.3.5 HVAC – Ventilation Air

The office area built up air handling system is configured to provide ventilation air. When the system is running a quantity of outside air taken in through a hood mixes with return air and is distributed throughout the office area. Excess return air is exhausted to the outside from a hood (see Mechanical photo 18 for intake and exhaust air hoods). It should be noted that some spaces in the office area are not connected to this ventilation system including the warehouse, storage rooms, and corridors which should be to be in compliance with ASHRAE 62.1 - Ventilation for Acceptable Indoor Air Quality.

The shops area of the building has no means of proving ventilation air in accordance with ASHRAE 62.1. It is recommended that a heat recovery system be installed to provide ventilation air to spaces in accordance with ASHRAE.

Use of heat recovery ventilator is recommended for energy savings. The existing washroom exhaust fans could be removed and washroom and lunch room exhaust ducted to the new heat recovery unit. The heat recovery unit would service the workshops, associated offices, corridors, and storage rooms. The new system would be provided with an outside air intake, exhaust air discharge, supply air electric tempering coil, associated controls, and distribution ductwork and grilles. The unit could be installed on an existing mezzanine level in one of the workshops. Ductwork would be run above the existing office area ceiling and exposed high in the workshop areas.

2.1.3.6 HVAC – Controls

The office area air handling system is provided with a master control unit (Viconics T7652A1000) located in an alcove off of the Male Washroom as per part 2.1.3.4 (see Mechanical photo 20). System zone bypass terminal units and perimeter heat as described in part 2.1.3.4 are controlled by non-networked thermostats (see Mechanical photo 23). Refer to section 2.1.3.4 for a more detailed description of these controls.

Washroom and other miscellaneous fans are controlled by simple toggle switches.

2.1.3.7 Fire Protection

No sprinkler system is present in the building.

The building is provided with portable fire extinguishers throughout. The majority of the extinguishers are dry chemical type suitable for class A, B, and C fires. All extinguishers had up to

date inspections. There appeared to be sufficient fire extinguishers for the hazard classification of the building.

2.1.3.8 Conclusions and Recommendations

The following recommendations are made for mechanical improvements to the depot building.

Plumbing:

- Revise trap piping on Male Washroom lavatory to be a P trap.
- Revise clothes washer standpipe to include a trap.
- Replace corroded and uneven sewer cleanout in Women's Washroom.
- Insulate remainder of accessible copper domestic water piping.
- Raise Female Washroom hot water tank setpoint temperature to between 50°C and 60°C.
- Replace Female Washroom hot water tank and pipe relief discharge piping to code.
- Replace copper domestic water piping in the mid-term.
- Replace hot water tank and provide hinged door on tank enclosure in the mid-term.
- Provide an electronic hands free flush valve on the urinal.

HVAC:

- If not already routinely done, schedule an inspection/testing/routine maintenance service call for the split air conditioning system complete with service report.
- If not already routinely done, schedule an inspection/testing/routine maintenance service call for the humidification system complete with service report.
- Replace Male Washroom exhaust fan with a higher capacity unit. Not required if a heat recovery system is installed.
- Update time, day, and schedules on HVAC system master controller.
- Provide a heat recovery system to service areas of the building not provided with ventilation.

2.1.4 Electrical Assessment

2.1.4.1 Service and Distribution

2.1.4.1.1 Description

The electrical service enters the main building overhead from three (3) pole mounted single phase distribution transformers (Refer to Electrical photo 1).

The main incoming service conductors are connected to a 400A, 3P, 120/208V Siemens ID425 disconnect switch (Refer to Electrical photo 2). The main disconnect feeds 400A, 120/208V, 3ϕ, 4W, 42CCT main panelboard Siemens Type P2 c/w 400A main circuit breaker.

Revenue metering is performed at building entrance after the main disconnect (Newfoundland Power #539394). The utility meter is installed inside the electrical room.

120/208V electricity is distributed through the facility is distributed through four (4) distribution panels fed from the main panelboard as follows:

- Panel A located in electrical Room (Refer to Electrical photo 3)
- Panel B located in electrical Room (Refer to Electrical photo 3)

- Panel located in the storage space above the electrical room (Refer to Electrical photo 4)
- Small load center in the hallway (Refer to Electrical photo 5)

Panels A, B, and the one located in the storage space above the electrical room are fed from the main panelboard through a splitter (Refer to Electrical photo 3).

2.1.4.1.2 OBSERVATIONS

The incoming 400A at 120/208V service capacity appears to be adequate.

Panels A, B and the load center in the hallway appears to be more than thirty (30) years old and are in fair physical condition. There were no visible signs of excessive wear or corrosion. Cabling/conduit runs also appeared to be in good condition with no apparent deficiencies.

Surface mounted panels in the electrical room and the recessed load center in the hallway feed all building lighting, heating and receptacle loads. There is no spare capacity on panels A, B and the hallway load center.

The panelboard located in the space above the electrical room is relatively new. It was observed that the front cover has been removed and is laying on the floor nearby.

The electrical room is used as storage space and access to the electrical equipment is blocked.

2.1.4.1.3 CONCLUSIONS

Based on the visual inspection of the facility, panels A, B, and the hallway loadcenters have exceeded their service life expectancy. New panels with sufficient spare capacity have to be installed in the next five (5) years.

The cover on the panel located above the electrical room must be reinstalled.

The communication rack is installed in front of the main disconnect and conflict with the required by CEC Rule 2-308(1) 1 m working space with secure footing.

2.1.4.2 EMERGENCY POWER SYSTEM

There is no emergency power distribution system.

2.1.4.3 LIGHTING

2.1.4.3.1 DESCRIPTION

The majority of the office areas are illuminated by 4 ft. recessed acrylic lens florescent fixture with T12 Lamps (Refer to Electrical photo 6).

Some service and storage rooms are lit with 4 ft. surface mounted wraparound fluorescent fixtures (Refer to Electrical photo 7).

The warehouse area is primarily illuminated by suspended open industrial fluorescent fixtures.

The exterior building lighting is provided by two (2) HID wallpacks c/w integral photocell control (Refer to Electrical photo 8).

The building lighting is fed from the 120/208V panelboards.

2.1.4.3.2 Observations

Office areas, corridors and warehouses were observed to have adequate lighting levels as required by the latest edition of the NBCC.

The lighting fixture in the office area, corridors and warehouses and the exterior lighting fixtures are in good condition.

Some wraparound fluorescent lighting fixtures are with missing acrylic lenses (Refer to Electrical photo 7).

As fluorescent lighting is T12 it should be replaced with T8 or LED fixtures in the mid-term due to the eventual phase out of T12 lamps and ballasts.

2.1.4.4 Exit and Emergency Lighting

2.1.4.4.1 Description

The building emergency lighting consists of dual head emergency battery units (Refer to Electrical photo 9). The battery units are of various age and are in relatively good condition.

The building is equipped with lighted exit signs located throughout (Refer to Electrical photo 10). The exit signs are battery backed-up and are lit with incandescent lamps.

2.1.4.4.2 Observations

Emergency lighting units and exit signs are adequate and are in good condition.

2.1.4.4.3 Conclusions

Provide 30-second monthly functional test. Consider battery replacement for 10 years old lead acid battery or for 15 years old nickel cadmium battery.

2.1.4.5 Heating System

2.1.4.5.1 Description

The whole building is heated by electrical heaters. The office area is heated by electric baseboard heaters c/w wall mount thermostats (Refer to Electrical photo 11). The workshops are heated by electric unit heaters c/w wall mount thermostats (Refer Electrical photos 12 and 13).

2.1.4.5.2 Observations

The electric heater in office area and warehouses area are in relatively good physical condition. There were no visible signs of excessive wear or corrosion. The heaters worked properly when operated.

2.1.4.6 Wiring Devices

2.1.4.6.1 Description

U-grounded, duplex receptacles are installed throughout the building. Receptacles are recessed. The outdoor receptacles are weather protected type duplex receptacles.

The lighting control in offices, service rooms and warehouses is provided by individual lighting switches for each circuit.

2.1.4.6.2 Observations

The indoor receptacles and lighting switches are sufficient quantity and in good condition.

There are three (3) outdoor receptacles, two old standard duplex receptacles and one new duplex GFCI receptacle. The GFCI receptacle is new and in good physical condition.

2.1.4.7 Wiring Methods

2.1.4.7.1 Description

Wiring system appears to be a combination of conductors run in EMT conduit, AC-90 and NMD90 cabling installed concealed in walls and above ceiling (Refer to Electrical photo 14).

2.1.4.7.2 Observations

The observed wiring appears to be in good condition.

2.1.4.8 Fire Alarm

2.1.4.8.1 Description

There is no fire alarm panel observed near the main entrance or in any other location in the office building. There are some fire alarm system devices such as pull stations and smoke detectors installed throughout the building but no one on site was aware of where they are connected (Refer to Electrical photo 15).

2.1.4.8.2 Observations

Wiring of the existing fire alarm devices is concealed and not visible. Pull stations are old but in relatively good condition. The smoke detectors are old and need replacement. No visual or audible signal alarms were apparent throughout the building.

2.1.4.8.3 Conclusions

Consider installation of the fire alarm annunciator/control panel next to the main entrance as required by NBCC, Clause 3.2.4.9. Connect the existing devices in good condition to the new fire alarm panel. Install new fire alarm system detectors and alarm devices as required.

2.1.4.9 Data and Communications

The building telecommunication cables enters the building in the electrical/telecommunication room. All telecom equipment including but not limited to telephone BIX blocks, telecom racks, patch panels, Ethernet switches, etc. and cabling is not more than 10 years old and is in good condition (Refer to Electrical photo 16).

2.1.4.10 CCTV / Security System

2.1.4.10.1 Description

There is a proximity card access control system that controls access to the building and building security system including keypad, sensors and controls. Both systems are relatively new and in good condition (refer to Electrical photos 17 and 18).

There is no CCTV system only camera integrated in the intercom Aiphone model JF-DA (Refer to Electrical photo 17).

2.1.4.11 PA System

There is public address (PA) system in the building integrated with the telephone system. The loudspeakers are surface mounted on building exterior walls (Refer to Electrical photo 8). The speakers are in good physical condition.

2.1.4.12 Conclusions and Recommendations

1. Consider installation of new fire alarm system panel with detectors and alarm devices. Reuse existing fire alarm pull stations.
2. Remove the materials stored in the electrical room and install warning sign on electrical room door “Electrical Room – No storage permitted”.
3. Install the panel cover on the panelboard in the space above the electrical room.
4. Relocate the communication rack installed in front of the main disconnect switch in order to provide 1 meter working space required by CEC.
5. Relocate the communication rack installed in front of the main disconnect to provide a 1 m working space.
6. Replace missing acrylic lenses on wraparound fluorescent lighting fixtures.
7. Replace both outdoor standard duplex receptacles and faceplates with new GFCI receptacles c/w weatherproof faceplates.
8. Panels A, B, and the hallway loadcenters should be replaced within the next five (5) years.
9. Replace T12 fluorescent light fixtures with T8 or LED fixtures in the mid-term.
10. Replace batteries in emergency lighting units in the mid-term.

2.1.5 Environmental Review

2.1.5.1 Air Emissions

No air emissions are present from the facility from fuel burning equipment or processes using chemicals.

2.1.5.2 Asbestos Containing Materials

An asbestos survey provided to the consultant indicated the presence of asbestos in drywall joint filler. The presence of these asbestos containing materials shall be made aware to any personnel undertaking work in the facility that could disturb these materials.

2.1.5.3 Lead Containing Materials

Lead is likely present in plumbing solder and possibly in oil based paints used in the facility. The potential presence of lead containing materials shall be made aware to any personnel undertaking work in the facility that could disturb these materials.

2.1.5.4 PCB Containing Materials

Fluorescent lighting in the facility is not old enough to be of concern for presence of PCB's that were commonly used in older lighting ballasts.

2.1.5.5 Ozone Depleting Substances

The office air conditioning system utilizes the recognized ozone depleting refrigerants R22. Older refrigerators may also contain ozone depleting refrigerants. Ozone depleting refrigerants must be recovered and properly documented prior to equipment being disposed of.

There was no Halon fire extinguishing systems identified in the facility.

2.1.5.6 Indoor Air Quality

While no indoor air quality issues were noticed while on site, a portion of the facility is not provided with proper ventilation and make-up air systems. Any odours, VOC's from off gassing, and other airborne pollutants cannot be effectively removed from the building.

2.1.5.7 Mould and Mildew

No signs of mould or mildew were present throughout the building.

2.1.5.8 Spills and Contaminated Areas

No signs of spills were observed inside the main office building. Some small spills were observed around the site based on stains (see Environmental Photos 1 to 5).

2.1.5.9 Flammable and Combustible Liquids Storage

Flammable and combustible liquids were found to be present in the Office Building.

Liquids found on open shelving or in cabinets other than rated safety cabinets in the Warehouse included (see Environmental Photos 6 to 9):

- Motor oil;
- Aerosol spray lubricants;
- Aerosol brake cleaner.

Liquids found on open shelving or in cabinets other than rated safety cabinets in the Workshops included (see Environmental Photos 10 to 12):

- Aerosol contact cement;
- Aerosol spray cleaners;
- Oil based paints;
- Compressor oil (low flammability).

Liquids found in the lean to adjacent to the building included (see Environmental Photos 13 to 15):

- Gasoline containers;
- Two stroke engine oil;
- Diesel fuel containers (in a safety Cabinet);

Liquids found outdoors included numerous 205 L drums of transformer oil and 205L drums marked as waste oil (see Environmental Photos 16 to 18). The waste oil drums were empty at the time of the site visit.

Quantities present do not exceed maximum amounts allowable for incidental use, however it is recommended that all flammable and combustible liquids inside the building be kept in rated safety cabinets.

2.1.5.10 Compressed Gases Storage

Quantities of compressed gases were observed within the building and in the yard (see Environmental Photos 19 to 21). Items found inside the building included:

- Single use propane cylinders stored on shelving in the Warehouse;
- One cylinder of nitrogen in the Protection and Control Shop Stock Room;
- Eight cylinders in the yard missing labels. It appeared the cylinders were empty and awaiting return.

The National Fire Code of Canada prohibits the indoor storage of Class 2.1 flammable gases of which propane is one unless the storage is in a specially designed room and not within a specified distance of other flammable and combustible liquids.

2.1.5.11 Conclusions and Recommendations

The following recommendations are made regarding environmental issues identified.

- Provide a rated vented safety cabinet in the Warehouse for storage of flammable/combustible liquids.
- Indoor air quality should be addressed as per the recommendation in the mechanical section of this report.
- The presence of asbestos and potentially lead containing materials are to be made aware to anyone undertaking work that may disturb these materials.
- Ozone depleting substances (refrigerants) should be properly recovered prior to disposing of equipment.
- Stained soil in the depot yard should be removed and properly disposed of.
- Stored propane cylinders should be moved to an outdoor storage area.

2.1.6 Energy Usage Review

Knowing the energy consumption of a facility from all sources (electricity, petroleum fuels, etc.) an energy use intensity (EUI) can be calculated which can be compared to benchmark EUI's for various types of buildings in Canada. These benchmarks represent median EUIs for various types of facilities. No energy consumption information was provided for this building so a EUI could not be calculated and the building compared with benchmarks.

2.2 Garage

2.2.1 Architectural Assessment

The building is a single level on grade pre-engineered steel structure of 166m^2 area. The space is principally a three bay open repair garage. Ancillary rooms include; washroom, office, lunch, parts, storage and two small low ceiling storage lofts. The building is estimated to be 20-25 years of age. It is in good condition.

2.2.1.1 Building Exterior Envelope

The exterior walls consist of a pre-engineered steel frame with steel girts and vertical pre-painted steel cladding. Backup consists of vinyl faced roll type glass fibre thermal insulation and pre-painted vertical steel liner panel at floor level.

Cladding exhibits localized surface corrosion near grade in several locations, sanding and painting is recommended.

Roofing consists of a standing seam low sloped gable steel panels with vinyl clad glass fibre roll type insulation.

Exterior doors include contemporary insulated pre-painted steel sectional overhead doors, two of which have personnel doors cut into them, two with motorized operators. Personnel doors are commercial metal in pressed steel frames with commercial hardware.

Windows are fixed and projected aluminum and are in good condition.

2.2.1.2 Building Interior

The interior finish of exterior walls in the garage area consists of pre painted vertical steel liner panel to an approximate height of 2.7-3.0 metres. Ancillary rooms exterior walls are finished with liner panel and some drywall. Partitions are of painted masonry block.

Ceilings are exposed roof structure vinyl clad insulation.

Interior doors are a combination of steel and solid core wood, painting is recommended.

Two small storage lofts exist. It is recommended that they be encased and not used since ceilings are low and access is not to code.

Lunch room equipment and millwork are in good condition. Flooring in the kitchen and washroom should be replaced and the office flooring would benefit from cleaning and waxing.

2.2.1.3 Building Code

The building is classified as F-2 Medium Hazard Industrial by the NBCC 2010.

The building generally appears to meet code with the exception of the existing in floor service pit which is missing guard rails, second egress, and explosion proof electrical. The pit appears to be abandoned as there is a significant amount of water in it.

2.2.1.4 Accessibility

The building is not accessible to persons with mobility challenges. Based on its estimated original construction date it ought to have been compliant with the Accessibility Act. However given the current age and use it is not recommended to modify the building to meet the Act.

2.2.1.5 SELECTED NBCC 2010/LSC 101 REQUIREMENTS

The following provides an overview of several National Building Code 2010/Life Safety Code NFPA 101 requirements and applicable sections for this facility.

Requirements	**Compliance / Action**
1) Building Occupancy Group F-2 – Medium Hazard Industrial *NBCC A-3.1.3.1*	Compliant
2) Group F, Division 2, Up To Two Storeys 1. A building classified as Group F, Division 2 is permitted to be of combustible construction or non-combustible construction used singly or in combination, provided: a. It has a building are not more than i. 1000 m^2 if facing 1 street, b. It is not more than two storeys in building height; c. Floor assemblies are fire separations and if of combustible construction, rated 45 minutes, and d. Loadbearing walls, columns, and arches supporting a rated assembly shall also be rated for 45 minutes or be of non-combustible construction. *NBCC 3.2.2.76*	Compliant
3) Occupant Load (Based on LSC) Group F2 - Medium Hazard Industrial: 166 m^2/46 m^2 per person = 3.6 persons Total Occupant Load = 3.6 persons (Service rooms, storage, circulation and washrooms are excluded)	Compliant
4) Exit Capacity The maximum size of rooms or suites with one exit are as follows: Group F-2 – 150 m^2 with a 10 metre travel distance to the egress door. *NBCC 3.4.2.1.A*	Compliant
5) Except if exits are located along the perimeter of the floor area and each main aisle in the floor area leads directly to an exit, the travel distance may be 60 metres maximum. NBCC 3.4.2.5	Compliant
6) The minimum width of a public corridor shall be 1100 mm. *NBCC 3.3.1.9*	N/A
7) Travel Distance shall be maximum of 30 metres. *NBCC 3.4.2.5*	Compliant
8) Exit capacity 4 persons x 6.1 mm per person = 24 mm *NBCC 3.4.3.2*	Compliant
9) Exits shall be separated from the remainder of the building by a fire separation having a fire resistance rating of not less than 45 minutes.	Compliant/N/A

Requirements	Compliance / Action
NBCC 3.4.4.1	
10) Washroom Fixture Calculation Group F2 – 4 persons: 1 washroom *NBCC 3.7.2.2*	Compliant
11) The building need not be designed to meet the NL Accessibility Act due to its function and age.	Compliant
12) Limiting distance:	Compliant

2.2.1.6 Conclusions and Recommendations

The building is in fair condition. Carryout code and finishes upgrades.

The following short term recommendations are made:

- Modify service pit to meet code by adding guard rails, second exit stair, explosion proof fixtures, or delete it and infill the pit.
- Re-paint interiors as well as exterior doors and frames.
- Replace main entry door threshold.
- Sand and re-paint corroded cladding.
- Clean and wax tile floors. Replace washroom and kitchen flooring.
- Paint steel liner panel in washroom.

The following mid- term recommendations are made:

- Replace overhead doors.

2.2.2 Structural Assessment

The garage is a pre-engineered steel structure with three vehicle bays. The building features a concrete foundation wall and an interior concrete slab on grade floor. The building is enclosed with metal siding and metal roofing.

2.2.2.1 Foundation and Floor Systems

The foundation wall that is exposed at grade level is in good condition. There are no signs of any deterioration.

The ground floor of the maintenance garage consists of a concrete slab on grade with a large service pit in the center vehicle bay. Both the pit and slab on grade appear to be in good condition. The only defects noted on the concrete was minor shrinkage cracks and typical marks due to equipment abrasion. There were no cracks observed in the slab under the vehicle lift.

The concrete pads outside of the garage doors are in fair condition with normal abrasions but no signs of cracking or settlement.

2.2.2.2 Roof Systems

The roof system is constructed of metal decking supported on steel Z-purlins spanning across rigid steel frames. The purlins were in excellent condition. The decking from the inside was not visible for inspection due to insulation covering. There were no signs of water stains or damage to the insulation to suggest that the decking was damaged in anyway.

2.2.2.3 Framing Systems

The building is a pre-engineered steel building with tapered wide flange columns and beams. There are two lines of interior rigid frames that provide the lateral bracing for the building. All of the steel structure is exposed on the inside of the building. The condition of the steel is very good with no signs of corrosion or distress.

2.2.2.4 Mezzanines

Two mezzanines are present. The mezzanine on the left side houses a lunch room and washroom with equipment storage at the mezzanine level. The mezzanine on the right side houses an office and storage room with dry storage at the mezzanine level. The floor systems of the mezzanines could not be viewed as it was concealed by ceiling finishes on the underside of the floor framing. While walking over the floor there did not appear to be any large deflections or sags in the system. Since the floor system could not be visually inspected, it will be classified as being in fair condition.

2.2.2.5 Hoist

The garage area is equipped with a jib crane with a maximum lifting capacity of 17.8kN (4000lbs). The jib crane is mounted to the floor. The structure is also in very good condition and recently inspected (2017) by Atlantic Crane.

2.2.2.6 Conclusions and Recommendations

Overall the maintenance garage is considered to be in very good condition. No recommended repairs are required at this time.

2.2.3 Mechanical Assessment

2.2.3.1 Plumbing – Drainage, Waste, and Venting

The facility is provided with one washroom containing a water closet and lavatory, and a lunch room with one sink (see Mechanical photo 1).

Visible sanitary drainage and vent piping is ABS. The fixtures are vented through the roof above the mezzanine (see Mechanical photo 2).

The sloped roof of the building is not provided with any roof drains.

The service pit in the garage is equipped with a sump pump (see Mechanical photo 3). The pump was not accessible so it could not be determined if it does not work or needed to be manually operated. A significant volume of water was present in the pit. The water appears to have petroleum products floating on it. If it is intended to continue use of the pit then the pump should

be verified to be operational and explosion rated. If not then the pump should be replaced with one suitable for hazardous areas.

An oil interceptor is located behind the garage and is provided with electronic monitoring in the garage (see Mechanical photos 4 and 5). The interceptor venting is not to code as one vent should terminate 300mm higher than the second vent and the vent terminations must be at least 2m above ground.

A wash down pad is provided adjacent to the garage and has a drain at its center (see Mechanical photo 6). It could not be confirmed if this pad drains to the nearby oil interceptor.

2.2.3.2 Plumbing – Domestic Water Piping and Systems

The source of domestic water is unknown as it may be an independent municipal service or taken from the office building. The water entrance is located near the main building entrance door (see Mechanical photo 7). The entrance is composed of a gate valve and pressure gauge. It is recommended that a backflow preventer be installed at the water entrance to prevent back siphonage.

Hot water is generated by a 43 Litre (10 Imp Gal) electric hot water tank (see Mechanical Photo 8). The tank is a 1.5 kW GSW model number SS12SEB. The tank was manufactured in 2004 based on its serial number. Based on its date of manufacture this tank has served its useful life. Under the plumbing code this tank should be provided with a drain pan. The hot water heater appeared to work properly. Hot water temperature was measured to be 44.4°C. The water temperature setpoint should be raised to between 50°C and 60°C to control the formation of legionella bacteria.

Hot and cold water piping within the building is copper and is not insulated. The piping appears to be in good condition though its age is unknown. A hose bib is provided at the side of the building near the main access door. The hose bibb is provided with an isolation valve inside the building to allow the outdoor portion to be drained. Two hose bibbs are provided inside the building.

2.2.3.3 Plumbing – Fixtures

The facility is provided with a water closet, lavatory, and sink in the lunch room. The water closet is a floor mounted type with flush box. The water closet worked properly.

The lavatory is a wall hung type china unit with two handle faucet. The lavatory worked properly however the cold water handle should be indexed properly.

The lunch room sink is a part of the one piece kitchenette unit. The sink and two handle faucet are in good condition and operated properly.

A self-contained wall mounted eyewash unit is provided in the Garage (see Mechanical Photo 9). The unit is inspected and maintained on a regular basis.

2.2.3.4 HVAC – Air Handling Systems

The facility is provided with four exhaust fans. The service bay area is provided with two roof mounted down blast type exhaust fans. The north side fan operated properly during the site visit, however the south side fan would not operate. It was not confirmed if this fan has the capacity to meet general ventilation requirements for this space. There is no source of make-up air present when these fans are operating other than what would come in through open doors or windows or around cracks in the building envelope. Without a source of make-up air there is no way to determine if exhaust rates are in accordance with NBCC and ASHARE codes and standards.

The service pit is equipped with an exhaust air duct which runs to an inline exhaust fan located above one of the overhead doors (see Mechanical photo 10). This fan could not be operated during the site visit. This fan is required to operate continuously when the building is occupied. The fan should be replaced with a unit of non-sparking construction and suitable for conveyance of combustible gases and provided with a visible indication of system operating. There is no source of make-up air present when this fan is operating other than what would come in through open doors or windows or around cracks in the building envelope. Without a source of make-up air there is no way to determine if exhaust rates are in accordance with NBCC and ASHARE codes and standards.

The washroom is equipped with a ceiling exhaust fan (see Mechanical photo 11).

A welding fume capture system composed of a articulating arm and exhaust fan is located on the left side wall of the building (see Mechanical photo 12). The system operated properly.

2.2.3.5 HVAC – Ventilation Air

There is no source of ventilation air for the building other than what infiltrates through cracks in the building envelope and around openings such as doors and windows. This building is not compliant with the National Building Code of Canada which required all buildings to be ventilated in accordance with ASHRAE 62.1.

It is recommended that a ventilation system be installed in the building to bring in minimum required outside air. Use of heat recovery ventilator is recommended for energy savings. The existing washroom could be ducted to the new heat recovery unit in lieu of a washroom exhaust fan. The new system would be provided with an outside air intake, exhaust air discharge, supply air electric tempering coil, associated controls, distribution ductwork and grilles, zone isolation dampers, and fire dampers. The heat recovery unit should be provided with face and bypass capability or preheat to enable continuous operation (no recirculation or supply fan shutdown type defrost). The unit could be located in the mezzanine level over the storage room and office. Ductwork would be run exposed high in the service bays and down to the lower floor spaces.

A tempered make-up air system should be provided to allow additional air as required to enter the building when general exhaust, welding, and pit exhaust systems are operational.

2.2.3.6 HVAC – Controls

There are no HVAC controls present. The existing rooftop exhaust fans are controlled by motor starters. The washroom exhaust fan is controlled by a toggle switch.

A carbon monoxide (CO) gas detector unit is located on the stock room wall (see Mechanical photo 13). The detector is a Critical Environmental Technologies Honeywell Vulcain 201M provided with a visible and audible alarm. The CO detector is not wired in to control the building exhaust fans. A nitrogen dioxide (NO2) sensor should also be provided as diesel powered vehicles may also be serviced in the garage. No gas sensing was present in the service pit. A CO sensor should be located here. Additional gas detection signaling in the form of audible and visual (strobe) should be provided. The upgraded gas detection system should be interlocked with general exhaust and make-up air system to automatically operate these in the event of low gas levels being detected. Upon high gas levels detected the audible and visual alarms would be triggered.

2.2.3.7 Fire Protection

The facility is provided with two dry chemical fire extinguishers rated 10A120BC and 6A60BC. The extinguishers are regularly inspected and are up to date.

2.2.3.8 Conclusions and Recommendations

The following recommendations are made for mechanical improvements to the depot building.

Plumbing:

- Replace existing service pit sump pump with one rated for hazardous location including associated wiring.
- Revise the venting on the oil interceptor to be code compliant.
- Provide a backflow preventer on the water entrance to the building.
- Insulate accessible domestic hot and cold water piping.
- Index the lavatory cold water faucet handle.
- Replace hot water tank and provide with drain pan.
- Increase the hot water temperature setpoint on the hot water tank to between 50°C and 60°C.

HVAC:

- Repair or replace the inoperative south end rooftop exhaust fan.
- Provide a heat recovery unit to meet minimum ventilation requirements.
- Replace the service pit exhaust fan with one of non-spark construction and suitable for conveyance of combustible gases. Provide visual system operation proving light.
- Increase general exhaust rates if required and provide tempered make-up air system for general exhaust capacity and pit and welding exhaust systems.
- Upgrade gas detection system with additional sensors, visual and audible alarm indication, and interlock with exhaust and make-up air systems.
- Provide nitrogen dioxide gas detection system if diesel vehicles are serviced in the garage.
- Provide service visit by qualified gas detection system representative to assess system and calibrate existing sensor.

2.2.4 Electrical Assessment

2.2.4.1 Service and Distribution

2.2.4.1.1 Description

The electrical service enters the maintenance garage building overhead from three (3) 50 kVA pole mounted overhead transformers located near the building.

The main incoming service conductors to the building are connected to 225A, 120/208V, 3ϕ, 4W, 42 CCT Federal Pioneer service entrance rated panelboard c/w 200A main circuit breaker (Refer to Electrical Photo 1).

Revenue metering is performed at 120/208V, three phase, 200A service. The meter (Newfoundland Power Meter #538916) is located outside on building wall.

Service entrance grounding is provided at the building service entrance rated panelboard using grounding rod driven in the ground outside the building.

The service entrance panelboard feed 225A, 120/208V, 3ϕ, 4W, 24 CCT panelboard c/w 100A main circuit breaker.

2.2.4.1.2 Observations

The incoming 200A at 120/208V service capacity appears to be adequate based on observed building loads.

Both panelboards appear to be more than twenty (20) years old and are in fair physical condition. The panelboards are surface mounted in the garage area and feeds all building lighting, heating, power tools and receptacle loads. There are three (3) spaces for circuit breakers available at main panelboard and (2) spaces in the subpanel for future loads. There are no filler plates on the available circuit breaker spaces.

2.2.4.1.3 Conclusions

Overall condition of the service entrance and the electrical distribution system appears to be in relatively good condition and don't need upgrade in the next ten (10) years.

2.2.4.2 Emergency Power System

There is no emergency power distribution system.

2.2.4.3 Lighting

2.2.4.3.1 Description

The building interior is illuminated by 4 ft. surface mounted florescent fixtures in the office, lunch room, washroom, storage areas, and at the workshop bench. The workshop area is illuminated by nine (9) high bay metal halide lighting fixtures (Refer to Electrical photo 2).

Building exterior lighting is provided by seven (7) HID photocells controlled wallpacks (Refer to Electrical photo 3).

The building lighting is fed from the 120/240V panelboard.

2.2.4.3.2 Observations

The building interior was observed to have adequate lighting levels as required by the latest edition of the NBCC.

The fluorescent lighting fixture are around twenty (20) years old and are in fair condition. The high bay lighting fixture are relatively new and in good condition.

2.2.4.4 Exit and Emergency Lighting

2.2.4.4.1 Description

The building emergency lighting is provided by dual head incandescent battery-backed emergency lighting units.

The building is equipped with self-luminous exit signs located throughout.

2.2.4.4.2 Observations

There is one (1) more than twenty (20) years old emergency lighting unit and one (1) old Exit sign that need replacement.

2.2.4.5 Heating System

2.2.4.5.1 Description

The building office, storage room, washroom, and lunch room are heated by electrical baseboard heaters and convection wall heaters c/w wall mounted thermostats (Refer to Electrical photo 4). The workshop area is heated with unit heaters c/w wall mounted thermostats.

2.2.4.5.2 Observations

The electric heaters are in relatively good physical condition. There were no visible signs of excessive wear or corrosion.

2.2.4.6 Wiring Devices

2.2.4.6.1 Description

U-grounded, recessed duplex receptacles are installed throughout the building. The outdoor receptacles are weather protected type duplex receptacles.

The interior lighting control is provided by individual lighting switches.

2.2.4.6.2 Observations

The indoor and outdoor receptacles and lighting switches are sufficient quantity. Most of the receptacles and lighting switches are original and are in fair condition.

2.2.4.7 Wiring Methods

2.2.4.7.1 Description

Wiring system appears to be a combination of AC-90 and NMD90 cabling concealed in walls and above ceiling in the office, storage room, washroom, and lunch room and building wires in surface mounted metallic conduits in the service bay area.

2.2.4.7.2 Observations

The observed wiring appears to be in good condition. Electrical equipment located in the service pit was observed not to be explosion proof (Refer to Electrical photo 5).

2.2.4.8 Fire Alarm

There is no fire alarm panel observed near the main entrance or in any other location in the maintenance garage building. There are two (2) pull stations at building exit doors but on site personnel did could not confirm where they are connected (Refer to Electrical photo 6).

Consider connection the existing pull station to new fire alarm panel installed in the office building. Install new fire alarm system detectors and alarm devices as required.

2.2.4.9 Data and Communications

2.2.4.9.1 Description

The building telecommunication cables enters the building in the workshop area overhead. All telecom equipment including but not limited to telecommunication rack, patch panels, Ethernet switches, etc. and cabling is not more than 10 years old and is in good condition.

The telephone system including the telephone equipment is relatively new, VoIP type and in good condition.

2.2.4.10 CCTV / Security System

2.2.4.10.1 Description

The maintenance garage building is connected to the main office building proximity card access control system. Panels are located adjacent to the distribution panels (Refer to Electrical photo 7). The card access system is relatively new and in good condition. There is building security system with motion detectors.

There is no CCTV system.

2.2.4.11 PA System

There is public address (PA) system in the building integrated with the telephone system. The loudspeakers are surface mounted on building exterior walls. The speakers are in good physical condition.

2.2.4.12 Conclusions and Recommendations

1. Replace one old emergency lighting unit and one old exit sign.
2. Install new fire alarm system devices and connect to new proposed fire alarm system panel in the office building as a separate zone.
3. Install filler plates on the empty circuit breaker spaces in both panelboards.

4. The garage pit is a hazardous area. The control station and any wiring located inside shall be replaced with an explosion proof type.
5. Panels should be replaced in the mid-term.
6. Replace T12 fluorescent light fixtures with T8 or LED fixtures in the mid-term

2.2.5 Environmental Review

2.2.5.1 Air Emissions

No air emissions are present from the facility from fuel burning equipment or processes using chemicals. The building appeared to have a oil burning appliance at one time as there is still a section of abandoned chimney present on the rear of the building.

2.2.5.2 Asbestos Containing Materials

An asbestos survey provided to the consultant indicated no presence of asbestos in this building.

2.2.5.3 Lead Containing Materials

Lead is likely present in plumbing solder and possibly in oil based paints used in the facility. The potential presence of lead containing materials shall be made aware to any personnel undertaking work in the facility that could disturb these materials.

2.2.5.4 PCB Containing Materials

Fluorescent lighting in the facility is not old enough to be of concern for presence of PCB's that were commonly used in older lighting ballasts.

2.2.5.5 Ozone Depleting Substances

No potential ozone depleting substances were observed.

There was no Halon fire extinguishing systems identified in the facility.

2.2.5.6 Indoor Air Quality

While no indoor air quality issues were noticed while on site, the facility is not provided with proper ventilation and make-up air systems. Any odours, fumes, VOC's from off gassing, and other airborne pollutants cannot be effectively removed from the building.

2.2.5.7 Mould and Mildew

No signs of mould or mildew were present throughout the building.

2.2.5.8 Spills and Contaminated Areas

No signs of spills were observed inside on the Garage floor. Water in the service pit appeared to have petroleum products floating on the surface (see Environmental Photo 22).

2.2.5.9 Flammable and Combustible Liquids Storage

Flammable and combustible liquids were found to be present in the Garage. These were primarily lubricants in small drums connected to a pneumatic dispenser system located on the mezzanine over the Washroom/Lunch Room (see Environmental Photo 23).

Access to the storage room and safety cabinet were not available so products and quantities in these locations could not be verified.

2.2.5.10 Compressed Gases Storage

Quantities of compressed gases were observed within the building (see Environmental photos 24 and 25). Items found inside the building included:

- Propane cylinders for a fork lift (one mounted on the fork lift and second one on floor);
- Oxygen / acetylene cylinders;

The National Fire Code of Canada prohibits the indoor storage of Class 2.1 flammable gases of which acetylene and propane are examples unless the storage is in a specially designed room and not within a specified distance of other Class 1 and Class II flammable and combustible liquids.

Access to the storage room and safety cabinet were not available so products and quantities in these locations could not be verified.

2.2.5.11 Conclusions and Recommendations

The following recommendations are made regarding environmental issues identified.

- Indoor air quality should be addressed as per the recommendation in the mechanical section of this report.
- The potential presence of lead containing materials is to be made aware to anyone undertaking work that may disturb these materials.
- Stored propane and acetylene cylinders should be moved to an outdoor storage area.

2.2.6 Energy Usage Review

Knowing the energy consumption of a facility from all sources (electricity, petroleum fuels, etc.) an energy use intensity (EUI) can be calculated which can be compared to benchmark EUI's for various types of buildings in Canada. These benchmarks represent median EUIs for various types of facilities. No energy consumption information was provided for this building so a EUI could not be calculated and the building compared with benchmarks.

2.3 Warehouse Building

2.3.1 Architectural Assessment

The building is a single level on grade pre -engineered steel structure of 134m^2 area. It is sub-divided into three rooms each with metal demising partitioning walls, two rooms have sectional overhead doors plus a single swing steel personnel door. The third room has a pair of steel swing doors. Each room is used for line crew equipment storage. The roof is a low slope gable with metal panels. Windows are steel with corroded steel security screening. Personnel doors are metal in pressed steel frames with commercial hardware. The building exterior should be painted. The building is in better condition than it first appears. Its age appears to be 30 plus years.

2.3.1.1 Building Exterior Envelope

Exterior walls consist of vertical pre-painted corrugated steel siding on steel girts and backed up by roll type vinyl clad glass fibre thermal insulation retained by steel mesh and exposed to the building interior. The standing seam steel panels sloped gable roof includes roll type vinyl clad glass fibre thermal insulation exposed to the interior. Siding is dented, corroded near grade and most paint has

peeled away. Eave soffits are also corroded in several localized areas. Repair and painting is recommended.

Overhead doors are sectional steel and appear to have been in existence for some years. One unit has double swing commercial steel doors in pressed steel frames with commercial hardware. The other two units have in addition to one overhead door a swing type commercial steel door in pressed steel frame with commercial hardware.

Doors and siding are corroded near grade requiring replacement. All siding needs to be painted. Security window screens should be removed and replaced. Rain gutter system is present along the front and it is corroded, requiring replacement.

Overhead doors should be replaced in the mid-term due to dents.

2.3.1.2 Building Interior

The interior finish of exterior roof and walls consists of exposed vinyl clad insulation. Floors are exposed concrete slabs.

2.3.1.3 Building Code

The building is classified as F-3 – Low Hazard industrial by the NBCC 2010.

The building appears to meet code with the possible exception of the proximity to the main office/line crew building. Addition of 120 minute rated drywall inside part of the building as well as 90 minute rated doors close to the main building are required.

2.3.1.4 Accessibility

The building is not formally accessible to persons with mobility challenges and due to its age and use is not required to meet the Accessibility Act.

2.3.1.5 Selected NBCC 2010/LSC 101 Requirements

The following provides an overview of several National Building Code 2010/Life Safety Code NFPA 101 requirements and applicable sections for this facility.

Requirements	**Compliance / Action**
1) <u>Building Occupancy</u> Group F-3 – Low Hazard Industrial *NBCC A-3.1.3.1*	Compliant
2) <u>Group F, Division 3, Up To Two Storeys</u> 3. A building classified as Group F, Division 3 is permitted to be of combustible construction or non-combustible construction used singly or in combination, provided: c. It has a building are not more than 1600 m^2 when facing one street d. It is not more than one storey in building height. *NBCC 3.2.2.83*	Compliant

Requirements	Compliance / Action
3) Occupant Load (Based on LSC) Group F3 - Low Hazard Industrial: 134m^2/46 m^2 per person = 2.9 persons Total Occupant Load = 3 person	Compliant
4) Exit Capacity The maximum size of rooms or suites with one exit are as follows: Group F-3 – 150 m^2 with a 10 metre travel distance to the egress door. *NBCC 3.4.2.1.A*	Compliant
5) Except if exits are located along the perimeter of the floor area and each main aisle in the floor area leads directly to an exit, the travel distance may be 60 metres maximum. NBCC 3.4.2.5	Compliant
6) The minimum width of a public corridor shall be 1100 mm. *NBCC 3.3.1.9*	N/A
7) Travel Distance shall be maximum of 30 metres. *NBCC 3.4.2.5*	Compliant
8) Exit capacity 3 persons x 6.1 mm per person = 9.3 mm *NBCC 3.4.3.2*	Compliant
9) Washroom Fixture Calculation *NBCC 3.7.2.2*	Building is used for storage only. No washroom is required.
10) The building need not be designed to meet the NL Accessibility Act requirements due to its size, age and function.	Compliant
11) Limiting distance:	Non- Compliant. Add 120 minutes of fire rated drywall inside the building along the right end and along the front to the overhead door proximate to the main building. Change the current personnel door to a 90 minute fire rated unit.

2.3.1.6 Conclusions and Recommendations

The following immediate term recommendations are made:

- Replace corroded siding, fascia, gutters windows and window screens.
- Paint cladding and doors.
- Add fire rated interior finish, and doors proximate to the main building due to limiting distance issues.

Mid-term upgrading:

- Replace overhead doors.

2.3.2 Structural Assessment

The Warehouse Building is a pre-engineered steel building with at concrete foundation. The structure is divided into three separate storage units; two of which are provided with an overhead door.

2.3.2.1 Foundation and Floor Systems

The top of the foundation wall is visible on the interior of the building and no visible signs of deterioration is present. The concrete slab on grade appears to be in good condition; only minor shrinkage cracks and slight abrasions are present.

2.3.2.2 Framing Systems

The building is supported by two interior rigid steel frames and two simply supported frames with a center column. The interior frames are concealed in the wall construction and were not visible for inspection. The exterior frames were visible and appeared to be in good condition.

2.3.2.3 Conclusions and Recommendations

The Warehouse Building is in good condition without any structural repairs required.

2.3.3 Mechanical Assessment

2.3.3.1 Plumbing – Drainage, Waste, and Venting

No drainage waste or vent systems are present in the building.

2.3.3.2 Plumbing – Domestic Water Piping and Systems

No domestic water systems are present in the building.

2.3.3.3 Plumbing – Fixtures

No plumbing fixtures are present in the building.

2.3.3.4 HVAC – Air Handling Systems

No air handling systems are present in the building.

2.3.3.5 HVAC – Ventilation Air

No ventilation air systems are present in the building. Natural ventilation can be achieved through use of building openings and through manually operable dampers on either end of the building (see Mechanical photos 1 and 2).

2.3.3.6 HVAC – Controls

No HVAC controls are present in the building.

2.3.3.7 Fire Protection

Each room of the building is provided with a type ABC dry chemical fire extinguisher. The extinguisher ratings are 4A60BC, 6A80BC, and 4A60BC. All extinguishers are 4.5 kg (10 lb) size. These extinguishers are suitable for the application. The extinguishers are regularly inspected and are up to date.

2.3.3.8 Conclusions and Recommendations

Based on the intended use of this building no mechanical systems are required other than the presence of the fire extinguishers.

2.3.4 Electrical Assessment

2.3.4.1 Service and Distribution

2.3.4.1.1 Description

The electrical service enters the warehouse building (old garage building) overhead from a pole mounted single phase distribution transformer.

The main incoming service conductors to the building are connected to a main 200A, 120/240V Square D, QO-40M service entrance rated panelboard c/w 200A main circuit breaker (Refer to Electrical photo 1).

Revenue metering is performed at 120/240V, single phase, 200A service. The meter (Newfoundland Power Meter #540361) is located outside on building wall.

Service entrance grounding is provided at the building main disconnect using grounding rod driven in the ground outside the building

2.3.4.1.2 Observations

The incoming 200A at 120/240V service capacity appears to be adequate.

The panelboard appear to be around twenty (20) years old and is in relatively good physical condition.

Panelboard is surface mounted in the storage area and feeds all building lighting, heating and receptacle loads. There are six (6) circuit breaker spaces available on the panelboard.

2.3.4.1.3 Conclusions

Overall condition of the service entrance and the electrical distribution system appears to be in relatively good condition.

2.3.4.2 Emergency Power System

There is no emergency power distribution system.

2.3.4.3 Lighting

2.3.4.3.1 Description

Two rooms are illuminated by 4 ft. surface mounted florescent strip lighting fixtures with a T12 lamps and wire guard. The third area is illuminated by old incandescent lighting fixtures (Refer to Electrical photos 2 and 3).

The exterior building lighting is provided by three (3) photocell controlled HID wallpacks installed on building walls (Refer to Electrical photo 4).

The building lighting is fed from the 120/240V panelboard.

2.3.4.3.2 Observations

The warehouse were observed to have adequate lighting levels as required by the latest edition of the NBCC.

The fluorescent lights are around fifteen (15) years old and in relatively good. The incandescent lighting fixtures are old and are in poor condition.

The exterior lights is relatively new and in good condition.

2.3.4.3.3 Conclusions

All old incandescent interior lighting fixtures have to be replaced. Install new fluorescent or LED lighting in the room with incandescent lighting. Existing T12 lighting should be replaced in the mid-term with T8 or LED.

2.3.4.4 Exit and Emergency Lighting

2.3.4.4.1 Description

Not available.

2.3.4.4.2 Conclusions

Install emergency lighting units in every storage room.

2.3.4.5 Heating System

2.3.4.5.1 Description

The building is partially heated by electrical unit heaters c/w wall mount thermostat. Only two (2) of the three (3) areas are heated.

2.3.4.5.2 Observations

The electric heaters are in relatively good condition.

2.3.4.5.3 Conclusions

No heater replacement will be required in the next 10 years.

2.3.4.6 Wiring Devices

2.3.4.6.1 Description

U-grounded, duplex receptacles are installed in only one of the three rooms of the building. The receptacles are surface mounted and in poor condition.

The lighting control is provided by individual lighting switches for each circuit.

2.3.4.6.2 Conclusions

The old receptacles including the outlet boxes and faceplates have to be replaced.

2.3.4.7 Wiring Methods

2.3.4.7.1 Description

Wiring system appears to be a combination of building wire in EMT and AC-90 cabling.

2.3.4.7.2 Observations

The observed wiring appears to be in good condition.

2.3.4.8 Fire Alarm System

Not available.

2.3.4.9 Data and Communications

Not available.

2.3.4.10 CCTV / Security System

2.3.4.10.1 Description

The storage building is connected to the main office building proximity card access control system. The card readers are relatively new and in good condition. There is no CCTV system.

2.3.4.11 PA System

Not available.

2.3.4.12 Conclusions and Recommendations

1. Replace the existing incandescent lighting fixtures with T8 fluorescent or LED lighting fixtures.
2. Replace the old receptacles, outlet boxes and faceplates.
3. Install emergency lighting units in all rooms.
4. Replace T12 lighting with T8 or LED in the mid-term.

2.3.5 Environmental Review

2.3.5.1 Air Emissions

No air emissions are present from the facility from fuel burning equipment or processes using chemicals.

2.3.5.2 Asbestos Containing Materials

Based on the age of the facility the presence of asbestos containing materials is unlikely. Based on asbestos surveys provided to the consultant no asbestos was present in this building.

2.3.5.3 Lead Containing Materials

Based on the age of the facility the presence of lead containing materials is unlikely.

2.3.5.4 PCB Containing Materials

Based on the age of the facility the presence of PCB materials is unlikely.

2.3.5.5 Ozone Depleting Substances

No ozone depleting substances were identified in the building.

2.3.5.6 Indoor Air Quality

No indoor air quality issues were noticed while on site.

2.3.5.7 Mould and Mildew

No signs of mould or mildew were present throughout the building.

2.3.5.8 Spills and Contaminated Areas

No signs of spills or were overserved in the building.

2.3.5.9 Flammable and Combustible Liquids Storage

Various flammable and combustible liquids were present in the building.

In the eastern most room the following items were identified outside of safety cabinets (see Environmental photos 26 to 28):

- Three 20 L gasoline containers;
- One 20 L kerosene container;
- Motor oil;
- Aerosol paints;
- BBQ starter fluid;
- Air brake anti-freeze.

The following items were observed in the safety cabinet in the east most room (see Environmental photos 29 to 31):

- BBQ starter fluid;
- Paint thinners;
- Oil based paints;
- Aerosol paints;
- Camp fuel;
- Two 20 L gasoline containers.

In the center room the following items were identified outside of safety cabinets (see Environmental photos 32 to 36):

- One 5 L gasoline container;
- Two stroke motor oil;
- Aerosol spray lubricant;
- Fuel stabilizer;
- BBQ starter fluid.

Quantities present of these liquids are permissible. It is recommended that they be stored in safety cabinets.

2.3.5.10 Compressed Gases Storage

Some compressed gases were observed in the building including one 20 lb cylinder in the eastern room and one 400g single use cylinder in the center room (see Environmental photos 37 to 38).

The National Fire Code of Canada prohibits the indoor storage of Class 2.1 flammable gases of which propane is one unless the storage is in a specially designed room and not within a specified distance of other flammable and combustible liquids.

Two gas cylinders were also located in the center room (see Environmental photo 37).

2.3.5.11 Conclusions and Recommendations

The following recommendations are made regarding environmental issues identified.

- Stored propane cylinders should be moved to an outdoor storage area.

2.3.6 Energy Usage Review

Knowing the energy consumption of a facility from all sources (electricity, petroleum fuels, etc.) a energy use intensity (EUI) can be calculated which can be compared to benchmark EUI's for various types of buildings in Canada. These benchmarks represent median EUIs for various types of facilities. As no energy usage information was provided to the consultant for this building (this building is fed from another metered building) a EUI could not be calculated and compared to benchmark data.

2.4 Storage Shed

2.4.1 Architectural Assessment

The building is a single level on grade pre-engineered loadbearing steel skin structure by Armco. The 22m^2 building is comprised of a single storage room. Galvanized steel walls and roof cladding are double skinned with an approximately 25 mm thick glass fibre insulation sandwich. The roof is a low slope standing seam gable style with steel panels. The ceiling is metal and there is a vented attic with gable end vents. The door is a single swing type steel in pressed steel frame. An unused side door exists. The building is used primarily for tire and petroleum product storage.

2.4.1.1 Building Exterior Envelope

Walls are structural double wall vertical corrugated galvanized steel with approximately 25 mm of glass fibre thermal insulation between the two layers of cladding. The steel sheeting is unpainted. The roofing consists of low slope gable style standing seam galvanized steel sheets. The steel sheets exhibit significant surface corrosion. The exterior door is hollow metal in a pressed frame with commercial hardware. The attic is vented via two gable end vents.

2.4.1.2 Building Interior

Walls are finished with the interior wythe of exterior wall sandwich galvanized metal sheeting. The flat ceiling is of a similar material. There is an attic but no access to it. Flooring consists of exposed concrete slab.

2.4.1.3 Building Code

The building is classified as F-2 – Medium Hazard Industrial by the NBCC 2010.

The building appears to meet building code.

2.4.1.4 Accessibility

The building is not accessible to persons with mobility challenges and due to its size, age and function is not required to comply with The Accessibility Act.

2.4.1.5 Selected NBCC 2010/LSC 101 Requirements

The following provides an overview of several National Building Code 2010/Life Safety Code NFPA 101 requirements and applicable sections for this facility.

Requirements	**Compliance / Action**
12) Building Occupancy Group F-2 – Medium Hazard Industrial *NBCC A-3.1.3.1*	Compliant
13) Group F, Division 2, Up To Two Storeys 4. A building classified as Group F, Division 2 is permitted to be of combustible construction or non-combustible construction used singly or in combination, provided: e. It has a building are not more than ii. 1000 m^2 if facing 1 street, f. It is not more than one storey in building height. *NBCC 3.2.2.76*	Compliant
14) Occupant Load (Based on LSC) Group F2 - Medium Hazard Industrial: 22 m^2/46 m^2 per person = 1 Total Occupant Load = 1 person	Compliant
15) Exit Capacity The maximum size of rooms or suites with one exit are as follows: Group F-2 – 150 m^2 with a 10 metre travel distance to the egress door. *NBCC 3.4.2.1.A*	Compliant
16) Travel Distance shall be maximum of 30 metres. *NBCC 3.4.2.5*	Compliant
17) Exit capacity 1 person x 6.1 mm per person = 6.1 mm *NBCC 3.4.3.2*	Compliant
18) Washroom Fixture Calculation *NBCC 3.7.2.2*	Building used as materials storage only, washroom not

Requirements	Compliance / Action
	required.
19) The building need not be designed to meet the NL Accessibility Act requirements due to its size and function.	Compliant

2.4.1.6 Conclusions and Recommendations

The building is in good condition generally.

The following mid- term recommendations are made:

- Replace existing galvanized steel roof panels.
- Paint door and frame.

2.4.2 Structural Assessment

The Tire Storage Shed is a small building with galvanized siding and interlocking panels.

2.4.2.1 Foundation and Floor Systems

The foundation of the tire storage shed is a concrete slab cast directly on the ground. There was no noticeable settlement or heaving and in general the slab appeared to be in good condition.

2.4.2.2 Roof Systems

The structural components of the roof system were not visible due to the paneling on the inside. The galvanized coating on the exterior roof panels was worn off and the metal was corroded. The corrosion is only minor and does not appear to penetrate through the panels.

2.4.2.3 Framing Systems

The structural components of the walls were not visible for inspection. The interior is lined with interlocking panels that are in good condition. The exterior is clad in galvanized vertical siding. The coating on the siding is in good condition. The panels around the door have impact damage.

2.4.2.4 Conclusions and Recommendations

Overall the Storage Shed appears to be in fair condition based on a limited visual inspection. There does not appear to be structural repairs required.

2.4.3 Mechanical Assessment

2.4.3.1 Plumbing – Drainage, Waste, and Venting

No drainage waste or vent systems are present in the building.

2.4.3.2 Plumbing – Domestic Water Piping and Systems

No domestic water systems are present in the building.

2.4.3.3 Plumbing – Fixtures

No plumbing fixtures are present in the building.

2.4.3.4 HVAC – Air Handling Systems

The building is provided with a wall propeller type exhaust fan. The fan is not currently wired up, as such its functionality could not be assessed.

2.4.3.5 HVAC – Ventilation Air

There is no source of ventilation air for the building other than what infiltrates through cracks in the building envelope and around openings such as doors. Based on the flammable and combustible liquids present in this building being stored only and not used in a process or being dispensed no ventilation is required.

2.4.3.6 HVAC – Controls

No HVAC controls are present in the building.

2.4.3.7 Fire Protection

The facility is provided with one type ABC dry chemical fire extinguisher. The extinguisher rating is 4A60BC and is a 4.5 kg (10 lb) size. The extinguisher is regularly inspected and is up to date. Based on the National Fire Code the minimum fire extinguisher rating required in tire storage areas is 4A80BC. Based on this the existing extinguisher should be replaced with one of the higher rating.

2.4.3.8 Conclusions and Recommendations

Based on the intended use of this building the existing fire extinguisher should be replaced with one rated 4A80BC.

2.4.4 Electrical Assessment

2.4.4.1 Service and Distribution

2.4.4.1.1 Description

The electrical service enters the storage shed underground from maintenance garage building panelboard.

The main incoming service conductors to the building are connected to a 100A, 120/240V, eighteen (18) circuit load center fed from a 30A, 2P circuit breaker on circuits #16/18 in the maintenance garage building subpanel. The load center is a Cutler-Hammer model number CCPL104.

There is no separate revenue metering for the building.

Service entrance grounding is provided at the building load center through bonding conductor connected to maintenance garage building grounding system.

2.4.4.1.2 Observations

The incoming 30A at 120/240V service capacity appears to be adequate based on observed building loads.

The load center appears to be not more than ten (10) years old and is in good physical condition.

The load center is surface mounted and feeds all building lighting, heating, and receptacle loads. There is one (1) spare circuit breaker and five (5) spaces for circuit breakers available for future loads.

2.4.4.1.3 CONCLUSIONS

The load center is new with sufficient spare capacity.

2.4.4.2 EMERGENCY POWER SYSTEM

There is no emergency power distribution system.

2.4.4.3 LIGHTING

2.4.4.3.1 DESCRIPTION

The building interior is illuminated by three (3) incandescent lighting fixtures. There is no building exterior lighting (Refer to Electrical photo 1).

The building lighting is fed from the 120/240V load center.

2.4.4.3.2 OBSERVATIONS

The building interior was observed to have adequate lighting levels as required by the latest edition of the NBCC.

The lighting fixtures are relatively new and in good condition.

2.4.4.4 EXIT AND EMERGENCY LIGHTING

2.4.4.4.1 DESCRIPTION

Not available.

2.4.4.5 HEATING SYSTEM

The storage shed is heated by an electric unit heater. The electric heater is in good physical condition. There were no visible signs of excessive wear or corrosion.

2.4.4.6 WIRING DEVICES

2.4.4.6.1 DESCRIPTION

Single U-grounded, surface mounted duplex receptacles is installed inside the building. A single GFCI receptacle is installed on building exterior wall.

The interior lighting control is provided by a single lighting switch.

2.4.4.6.2 OBSERVATIONS

The indoor and outdoor receptacles and lighting switches are sufficient quantity. The indoor receptacle is relatively new and in good condition. The outdoor receptacle is without cover and has to be replaced including the weatherproof faceplate.

2.4.4.7 Wiring Methods

2.4.4.7.1 Description
Wiring system appears to be building wires in surface mounted EMT conduit.

2.4.4.7.2 Observations
The observed wiring appears to be in relatively good condition.

2.4.4.8 Fire Alarm
Not available.

2.4.4.9 CCTV / Security System
2.4.4.9.1 Description
There is a proximity card reader and door contacts connected to the office building access control system that controls access to the building. The card access reader and the door switch are in good condition.

There is no CCTV system.

2.4.4.10 PA System
Not available.

2.4.4.11 Conclusions and Recommendations
1. Install emergency lighting unit inside the storage shed.
2. Replace the outdoor GFCI receptacle including the weatherproof faceplate.

2.4.5 Environmental Review
2.4.5.1 Air Emissions
No air emissions are present from the facility from fuel burning equipment or processes using chemicals.

2.4.5.2 Asbestos Containing Materials
Based on the age of the facility the presence of asbestos containing materials is unlikely. Based on asbestos surveys provided to the consultant no asbestos was present in this building.

2.4.5.3 Lead Containing Materials
Based on the age of the facility the presence of lead containing materials is unlikely.

2.4.5.4 PCB Containing Materials
Based on the age of the facility the presence of PCB materials is unlikely.

2.4.5.5 Ozone Depleting Substances
No ozone depleting substances were identified in the building.

2.4.5.6 Indoor Air Quality

No indoor air quality issues were noticed while on site.

2.4.5.7 Mould and Mildew

No signs of mould or mildew were present throughout the building.

2.4.5.8 Spills and Contaminated Areas

There were no visible signs of spills within the building.

2.4.5.9 Flammable and Combustible Liquids Storage

Flammable and combustible liquids were found to be present in the Storage Shed on shelving (see Environmental photos 39 to 42). Liquids found included:

- Two 5 L gasoline containers;
- Hydraulic oil;
- Transmission fluid;
- Motor oil;
- Other lubricants.

Quantities present do not exceed maximum amounts allowable for incidental use.

2.4.5.10 Compressed Gases Storage

No compressed gas storage was present.

2.4.5.11 Conclusions and Recommendations

No environmental issues were noted.

2.4.6 Energy Usage Review

Knowing the energy consumption of a facility from all sources (electricity, petroleum fuels, etc.) a energy use intensity (EUI) can be calculated which can be compared to benchmark EUI's for various types of buildings in Canada. These benchmarks represent median EUIs for various types of facilities. As no energy usage information was provided to the consultant for this building (this building is fed from another metered building) a EUI could not be calculated and compared to benchmark data.

2.5 Equipment Storage Platforms

2.5.1 Structural Assessment

The Stephenville Office site has one large equipment storage platform measuring 30 m x 3 m located in the lower yard at the rear of the property (see Equipment Platform photos 1 to 10). The platform consists of three rows of rough sawn timber girders (125mm x 250mm) supported on timber piles. Rough sawn deck boards (40mm x 100mm) span between the girders to form the platform.

Overall, the condition of the platform is poor. The majority of the deck boards have dried out, rotted or missing. The platform also leans to the rear. It is not clear if the back posts have settled or if it was constructed that way. The platform is currently cordoned off with red tape because hydro

personnel do not trust its structural capability. The only positive is that the girders and poles appear to be in good shape.

A small second platform is located behind the Garage (see Equipment Platform photo 11). The platform is approximately 5 m x 1 m in size. The platform consists of two rows of rough sawn timber girders (50mm x 200mm) supported on timber piles. Rough sawn deck boards (40mm x 150mm) span between the girders to form the platform.

Overall, the condition of the platform is poor. A number of the deck boards have dried out, rotted or missing. The piles appear to be in good shape.

2.5.1.1 Conclusions and Recommendations

The equipment platforms are in poor condition and it is recommended they be reconstructed or replaced. The timber piles may be able to be reused and some of the girders may be salvageable.

2.6 Civil/Site Assessment

2.6.1 Asphalt and Concrete Surfaces

The public side of the Office building and between the Office building and the Garage are surfaced with asphalt (see Site/Civil photos 1 to 7). The asphalt is in fair to good condition. The asphalt is failing near edges in the public parking area, near the Garage, as well as along the north side (see Site/Civil photos 2, 4 and 7). Asphalt failure was also observed between two areas within the yard (see Site/Civil photo 5)

Concrete surfaces are present at the public entrance, at the rear of the Office building, at each Garage service bay, at each entrance to the Warehouse building, and at a wash down area adjacent to the Garage (see Site/Civil photos 1, and 8 to 11). These concrete structures are in good condition with no serious cracking and surface abrasions from snow clearing or tracked equipment use.

The remainder of the yard is gravel including the storage yard at the rear of the office building (see Site/Civil photos 12 and 13). The gravel portions of the site are generally in good condition with no significant depressions or washout areas observed. The east and west access roads down to the storage yard are steep and show erosion from surface runoff (see Site/Civil photos 14 and 15). It is recommended that these two access roads be regraded.

2.6.2 Water and Sewer

Water is supplied from the municipal system. As indicated while onsite the water entrance to the Office building could not be located. A curb stop was observed on the east side of the building. It is not known of the Garage water supply is a separate municipal service or is fed from the Office building.

Sanitary sewer is connected to the municipal system.

No issues with the water system or sewage system were reported during the site visit.

2.6.3 Drainage

The site generally slopes from the south to the north with surface drainage going to a stream located to the north of the property. A storm drain was observed on the south side of the Office building in the parking area (see Site/Civil photo 1).

No standing water was observed on site, however there are a couple of locations where water would tend to hold up including near the upper yard gate and adjacent to the Garage (see Site/Civil photos 16 and 4).

There is no indication that any of the buildings are provided with foundation drainage, however it may be present.

2.6.4 Site Fencing

The depot yard is surrounded by a chain link fence. All buildings are located within the fenced in yard with the exception of the front of the Office building.

Inspection of the fencing revealed some issues including (see Site Civil Photos 17 to 24):

- Support brace broken on section in lower west yard.
- Sections of fence leaning in lower east yard.
- Sections of fence leaning in upper west yard.
- Fencing mesh bowed out upper south yard.
- Barb wire off, other wires require tensioning, and brace bar support bracket missing upper south yard.
- Conduit off fencing upper west yard.

2.6.5 Conclusions and Recommendations

The following recommendations are made for site civil:

- Regrade east and west access roads to lower yard.
- Make repairs to site fencing.

CHAPTER 3 REHABILITATION EXPANSION UPGRADE ASSESSMENT

3.1 Office Building

Based on current usage, and beyond repairs and code upgrades identified in Chapter 2 of this report, expansion is recommended for this facility. Personnel on site indicated that they have inadequate space for their workshop areas and that an expansion of the building would be required to accommodate their needs. To accommodate future expansion it is proposed to add a 68m^2 extension to the left of the current Protection and Control Shop to expand the shop area. Work would specifically include a new extension to house one workshop and to reconfigure the existing three workshops into two workshops. A concept plan of the proposed extension and renovations is provided in Appendix C.

The building extension would be slab on grade construction with concrete foundation wall and footings, wood frame construction, pre-engineered roof trusses, batt insulation, wood sheeting, asphalt roofing, and commercial metal siding. Alternatively, a steel framed extension could be provided to match the existing structure complete with pre-engineered roof trusses, asphalt roofing and commercial metal siding. Two single man doors would be provided for this space. Interior finishes would be a combination of drywall and painted plywood in low areas of the workshop and drywall ceilings

Mechanically the extension would be fitted with potable water distribution if required. These would be tied into existing services. The proposed heat recovery ventilation system would be extended to this area or an independent one provided if the extension construction occurred after the existing building was serviced. Fire extinguishers would be provided for fire protection.

Electrically the extension would be serviced through the existing service and spare breakers. Interior lighting would be T8 fluorescent or LED. Exterior lighting would be LED with photocell control. New battery powered emergency lighting units would be provided. Sufficient receptacles would be provided throughout. Heating would be with electric unit heaters. New data and communications outlets would be provided and the fire alarm system expanded to the new area.

3.2 Garage

Based on current usage, and beyond repairs and code upgrades identified in Chapter 2 of this report, no major rehabilitation, expansion, or upgrades are recommended for this facility.

3.3 Warehouse Building

Based on current usage, and beyond repairs identified in Chapter 2 of this report, no major rehabilitation, expansion, or upgrades are recommended for this facility.

3.4 Storage Shed

Based on current usage, and beyond repairs and code upgrades identified in Chapter 2 of this report, no major rehabilitation, expansion, or upgrades are recommended for this facility.

3.5 Pole Ramps and Equipment Platforms

Based on current condition indicated in Chapter 2 of this report, rehabilitation of the equipment platforms is recommended for this site. The existing structures are in poor condition and repair of them is not practical.

The platforms would be constructed to the same size and heights unless any operational requirements would demand changes. Construction could be done with similar wood structure and decking or hybrid construction utilizing galvanized steel piles and beams with wood decking.

CHAPTER 4 COST ESTIMATES

4.1 Recommended Renovations and Improvements to Existing Facilities

4.1.1 Purpose

This section provides an overview of the costs associated to complete the recommended repairs and upgrades outlined above for each building to maintain current operations and functionality and comply with current codes. New construction and extension cost estimates include incorporation of expansion, and upgrading of facilities to service future operational requirements.

Renovation, maintenance and repair costs are grouped into three categories: Immediate; Mid-Term; and Long-Term. The work considered for immediate repairs would include all things which pose a threat to life safety and would also include correcting deficiencies with structural, civil, environmental, mechanical, and electrical. For the regularly occupied buildings, and buildings intended for long-term use, these renovations would be very important to complete for the safety, well-being, and comfort of occupants. For buildings determined to be unsuitable for long-term future use, only repairs which are deemed absolutely necessary would be considered.

Mid-term repairs would be intended for completion in the 3 to 10 year range, assuming the repairs listed as immediate are completed. This could include such items as architectural finishes replacement, end of serviceable life equipment replacement or upgrading of equipment to better service the facility. The long-term repair category would also only apply to buildings intended for extended use as these repairs would fall in the range of 10 to 20 years. These long-term repairs also require the immediate and mid-term repairs to be completed as intended.

4.1.2 Cost Estimating Accuracy

The estimates contained in this report are intended to provide order of magnitude construction costs only and are accurate to Class 3 (-10 to +30%) standards as per generally recognized industry practices. Estimates are based on the site observations (repairs & upgrades) and with the owner's future use and operations considered (new construction/extension). The estimates include appropriate contractor overhead, design contingency and location factors. All estimates are intended to provide an order of magnitude indication of the final project cost and are considered to be sufficient for the purpose of analyzing the redevelopment options under consideration. The figures listed below are an indication of the probable construction cost at the time of this report and are intended to represent fair market value of the scope of work assuming that such work is grouped into reasonably sized contract packages. Unless noted otherwise, architectural and

engineering design fees are not included, nor are value-added taxes. All costs are expressed in Canadian dollars.

4.1.3 Office Building

4.1.3.1 Immediate Maintenance and Repairs

The following renovations, repairs, and/or upgrades are recommended to be completed within the next two years, assuming the facility is intended to continue operations.

Architectural:

- Enclose janitorial supplies in 60 minute fire rated room - $6,500
- Continue main corridor through existing kitchen to create continuous dedicated exit path to eliminate current dead ending - $2,500
- Eliminate existing lean to flammable storage shed at rear of building - $2,000
- Replace male washroom and lunch flooring - $4,000
- Removed loose stored items from electrical and data rooms - $500
- Add upper area attic vents - $2,500
- Add attic access hatch - $1,600

Site/Civil:

- Regrade east and west access roads to lower yard - $2,500
- Make repairs to site fencing - $7,000

Mechanical:

- Revise trap piping on Male Washroom lavatory to be a P trap - $500
- Revise clothes washer standpipe to include a trap - $500
- Replace corroded and uneven sewer cleanout in Women's Washroom - $2,500
- Insulate remainder of accessible copper domestic water piping - $3,500
- Raise Female Washroom hot water tank setpoint temperature to between 50°C and 60°C - $300
- Replace Female Washroom hot water tank and pipe relief discharge piping to code - $3,500
- Provide an electronic hands free flush valve on the urinal - $2,200
- Have an inspection/testing/routine maintenance service call for the split air conditioning system completed - $1,200
- Have an inspection/testing/routine maintenance service call for the humidification system completed - $1,200
- Replace Male Washroom exhaust fan with a higher capacity unit. Not required if a heat recovery system is installed - $2,000
- Update time, day, and schedules on HVAC system master controller - $1,000
- Provide a heat recovery system to service areas of the building not provided with ventilation - $26,000

Electrical:

- Consider installation of new fire alarm system panel with detectors and alarm devices. Reuse existing fire alarm pull stations - $18,000
- Remove the materials stored in the electrical room and install warning sign on electrical room door "Electrical Room – No storage permitted" - $500

- Install the panel cover on the panelboard in the space above the electrical room - $200
- Relocate the communication rack installed in front of the main disconnect to provide a 1 m working space - $3,500
- Replace missing acrylic lenses on wraparound fluorescent lighting fixtures - $800
- Replace both outdoor standard duplex receptacles and faceplates with new GFCI receptacles c/w weatherproof faceplates - $600

Environmental:

- Provide a rated vented safety cabinet in the Warehouse for storage of flammable/combustible liquids - $4,000
- Stained soil in the depot yard should be removed and properly disposed of - $1,000
- Stored propane cylinders should be moved to an outdoor storage area - $500

Estimated total cost for immediate repairs and upgrades:
$102,600 sub-total cost x 10% contingency = $112,900 total cost

4.1.3.2 Mid-Term Maintenance and Repairs

The following list contains recommended renovations and repairs for completion in the next 3 to 10 years, again assuming the building will remain in operation. These repairs would progress after the items listed in the immediate repair category are complete.

Mechanical:

- Replace copper domestic water piping - $14,000
- Replace hot water tank and provide hinged door on tank enclosure - $1,800

Electrical:

- Panels A, B, and the hallway loadcenters should be replaced within the next five (5) years - $9,000
- Replace T12 fluorescent light fixtures with T8 or LED fixtures - $19,500
- Replace batteries in emergency lighting units - $2,500

Estimated total cost for mid-term repairs and upgrades:
$46,800 sub-total cost x 10% contingency = $51,500 total cost

4.1.4 Garage

4.1.4.1 Immediate Maintenance and Repairs

The following renovations, repairs, and/or upgrades are recommended to be completed within the next two years, assuming the facility is intended to continue operations.

Architectural:

- Modify service pit to meet code by adding guard rails and second exit stair, or delete it and infill the pit - $11,000
- Re-paint interiors as well as exterior doors and frames - $4,000
- Replace main entry door threshold - $1,200
- Sand and re-paint corroded cladding - $4,500

- Clean and wax tile floors. Replace washroom and kitchen flooring - $3,000
- Paint steel liner panel in washroom - $800

Mechanical:

- Replace existing service pit sump pump with one rated for hazardous location - $7,000
- Revise the venting on the oil interceptor to be code compliant - $800
- Provide a backflow preventer on the water entrance to the building - $1,800
- Insulate accessible domestic hot and cold water piping - $1,000
- Index the lavatory cold water faucet handle - $200
- Replace hot water tank and provide with drain pan - $1,500
- Increase the hot water temperature setpoint on the hot water tank to between 50°C and 60°C - $200
- Repair or replace the inoperative south end rooftop exhaust fan - $3,500
- Provide a heat recovery unit to meet minimum ventilation requirements - $18,000
- Replace the service pit exhaust fan with one of non-spark construction and suitable for conveyance of combustible gases. Provide visual system operation proving light - $8,000
- Increase general exhaust rates if required and provide tempered make-up air system for general exhaust capacity and pit and welding exhaust systems - $12,000
- Upgrade gas detection system with additional sensors, visual and audible alarm indication, and interlock with exhaust and make-up air systems - $10,000
- Provide nitrogen dioxide gas detection system if diesel vehicles are serviced in the garage - $4,000
- Provide service visit by qualified gas detection system representative to assess system and calibrate existing sensor - $1,200

Electrical:

- Provide filler plates on spare breaker spaces in power panels - $500
- Replace one (1) more than twenty (20) year old emergency lighting unit and one (1) old Exit sign - $1,200
- Provide explosion proof wiring and lighting in the service pit if it will be kept functional - $5,000
- Consider connection the existing pull station to the recommended new fire alarm panel for the office building. Install new fire alarm system detectors and alarm devices as required - $3,500.

Environmental:

- Stored propane and acetylene cylinders should be moved to an outdoor storage area - $2,000

Estimated total cost for immediate repairs and upgrades:
$107,100 sub-total cost x 10% contingency = $117,800 total cost

4.1.4.2 Mid-Term Maintenance and Repairs

The following list contains recommended renovations and repairs for completion in the next 3 to 10 years, again assuming the building will remain in operation. These repairs would progress after the items listed in the immediate repair category are complete.

Architectural:

- Replace overhead doors - $27,000

Electrical:

- Panels should be replaced within the next ten (10) years - $9,000
- Replace T12 fluorescent light fixtures with T8 or LED fixtures - $4,500

Estimated total cost for mid-term repairs and upgrades:
$40,500 sub-total cost x 10% contingency = $44,600 total cost

4.1.5 Warehouse Building

4.1.5.1 Immediate Maintenance and Repairs

The following renovations, repairs, and/or upgrades are recommended to be completed within the next two years, assuming the facility is intended to continue operations.

Architectural:

- Replace corroded siding, fascia, gutters windows and window screens - $14,000
- Paint cladding and doors - $6,000
- Add fire rated interior finish, and doors proximate to the main building due to limiting distance issues - $5,000

Electrical:

- Replace the existing incandescent lighting fixtures with T8 fluorescent or LED lighting fixtures - $4,500
- Replace the old receptacles, outlet boxes and faceplates - $2,000
- Install emergency lighting units in all rooms - $4,500

Environmental:

- Stored propane cylinders should be moved to an outdoor storage area - $500

Estimated total cost for immediate repairs and upgrades:
$36,500 sub-total cost x 10% contingency = $40,200 total cost

The following list contains recommended renovations and repairs for completion in the next 3 to 10 years, again assuming the building will remain in operation. These repairs would progress after the items listed in the immediate repair category are complete.

Architectural:

- Replace overhead doors - $14,000

Electrical:

- Replace T12 lighting with T8 or LED - $9,000

Estimated total cost for mid-term repairs and upgrades:
$23,000 sub-total cost x 10% contingency = $25,300 total cost

4.1.6 Storage Shed

4.1.6.1 Immediate Maintenance and Repairs

The following renovations, repairs, and/or upgrades are recommended to be completed within the next two years, assuming the facility is intended to continue operations.

Mechanical:

- The existing fire extinguisher should be replaced with one rated 4A80BC - $400

Electrical:

- Install an emergency lighting unit inside the storage shed - $1,500
- Replace the outdoor GFCI receptacle including the weatherproof faceplate - $500

Estimated total cost for immediate repairs and upgrades:
$2,400 sub-total cost x 10% contingency = $2,600 total cost

4.1.6.2 Mid-Term Maintenance and Repairs

The following list contains recommended renovations and repairs for completion in the next 3 to 10 years, again assuming the building will remain in operation. These repairs would progress after the items listed in the immediate repair category are complete.

Architectural:

- Replace existing galvanized steel roof panels - $7,500
- Paint door and frame - $800

Estimated total cost for mid-term repairs and upgrades:
$8,300 sub-total cost x 10% contingency = $9,100 total cost

4.2 Rehabilitation and Expansion Upgrades Costing

4.2.1 Office Building Extension

The opinion of probable cost to construct the proposed building extension is presented in the table below.

Item	Probable Cost ($)
Demolition of exterior siding, roofing, openings, interior partitions, floor cutting, etc	9,000
Site grading, foundation drainage	11,000
Substructure and slab on grade	31,300
Roof structure	14,200
Framing and exterior envelope	36,500
Roof coverings	9,500
Openings - doors, windows	14,500
Plumbing	5,000
HVAC	8,000
Electrical	23,000

Item	Probable Cost ($)
Subtotal	162,000
Contractor bonding, insurance, project management, general contractor mark-ups.	33,000
Design and project management costs	39,000
Total	234,000

4.2.2 Equipment Platforms Rehabilitation

The opinion of probable cost to replace the existing equipment platforms is presented in the table below.

Item	Probable Cost ($)
Demolition of existing platforms (includes removal of existing equipment and materials on platforms)	4,000
Construction of 30mx3m platform	32,000
Construction of 5mx1m platform	5,500
Reinstate existing equipment and materials on platforms	1,500
Subtotal	43,000
Contractor bonding, insurance, project management, general contractor mark-ups.	10,000
Design and project management costs	11,000
Total	64,000

CHAPTER 5 CAPITAL COST SUMMARY AND COMPARISON OF SCENARIOS

5.1 Capital Cost Summary

5.1.1 Table 2: Capital Cost Summary

Building/Action	Construction Costs
Office Building	
Immediate (1-2 years)	$112,900
Mid-Term (3-10 years)	$51,500
Long-Term (10-20 years)	$0
Garage	
Immediate (1-2 years)	$117,800
Mid-Term (3-10 years)	$44,600
Long-Term (10-20 years)	$0
Warehouse Building	
Immediate (1-2 years)	$40,200
Mid-Term (3-10 years)	$25,300
Long-Term (10-20 years)	$0
Storage Shed	
Immediate (1-2 years)	$2,600
Mid-Term (3-10 years)	$9,100
Long-Term (10-20 years)	$0
New extension to existing building	$234,000
Equipment platform rehabilitation	$64,000

Costs provided in these tables do not include HST. Costs provided are in current Canadian dollars and escalation values may have to be applied to renovations in future years to account for such factors as inflation, exchange rate, and competitiveness of construction industry.

This opinion of probable costs is presented on the basis of experience, qualifications, and best judgment. It has been prepared in accordance with acceptable principles and practices. Sudden market trend changes, non-competitive bidding situations, unforeseen labour and material adjustments and the like are beyond the control of CBCL Limited. We cannot warrant or guarantee that actual costs will not vary significantly from the opinion provided.

FINAL REPORT

Issued by:



Paul Sceviour, MASc., P.Eng.
Senior Mechanical Engineer

This document was prepared for the party indicated herein. The material and information in the document reflects CBCL Limited's opinion and best judgment based on the information available at the time of preparation. Any use of this document or reliance on its content by third parties is the responsibility of the third party. CBCL Limited accepts no responsibility for any damages suffered as a result of third party use of this document.

APPENDIX A

Site Photos – Office Building

APPENDIX A

ARCHITECTURAL PHOTOS







Main entrance.

Typical roof soffit/fascia. Note double roof.





Typical window. Note deep reveal indicating added insulation and cladding.



Hip roof above original roof.



Representative exterior door.



Soffit/fascia of double roof with unprotected soffit hole.



Proximity of lean-to flammable storage between main and storage buildings.

Interior of lean-to.





Lean-to, to main building interface.



Main building shops access with storage building in background.



Shops access.



Rear façade with lean-to and storage building in background.



East façade.



Partial rear façade with lean-to and storage building in background.



Storage warehouse.

Storage warehouse.





Storage warehouse.

Janitorial supplies, which require rated room enclosure.





Storage warehouse.

Meeting/Training room.





Main corridor.



Kitchen/lunch/ main circulation route to second exit and shops wing.

.



Male washroom. Note flooring condition.



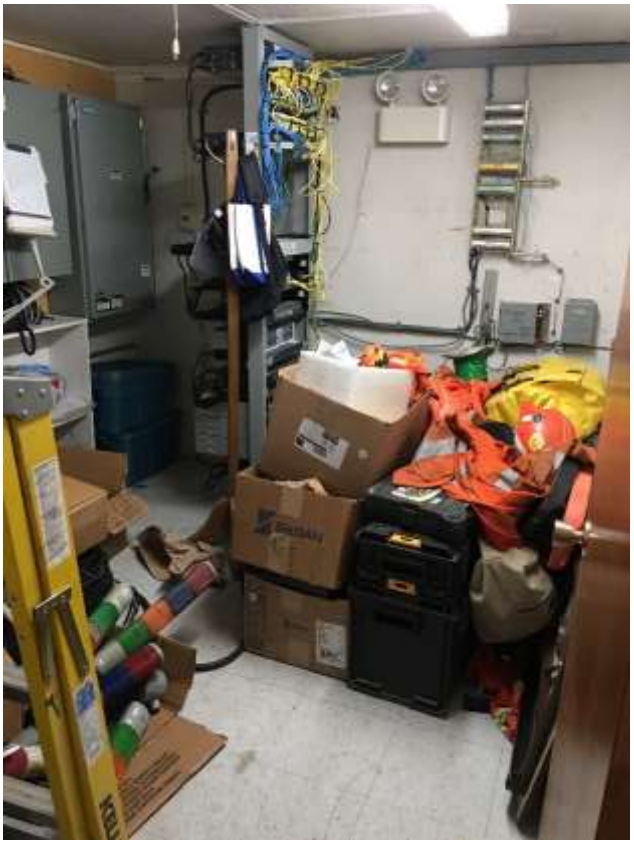
Male washroom.



Male washroom. Note flooring condition.

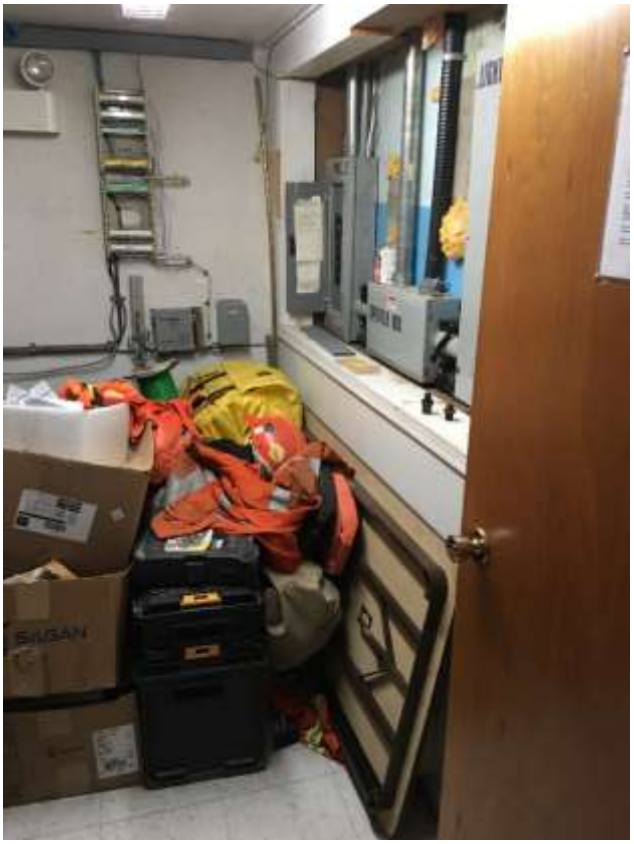
Laundry within male washroom.





Electrical/ communications room. Note items stored hazard.

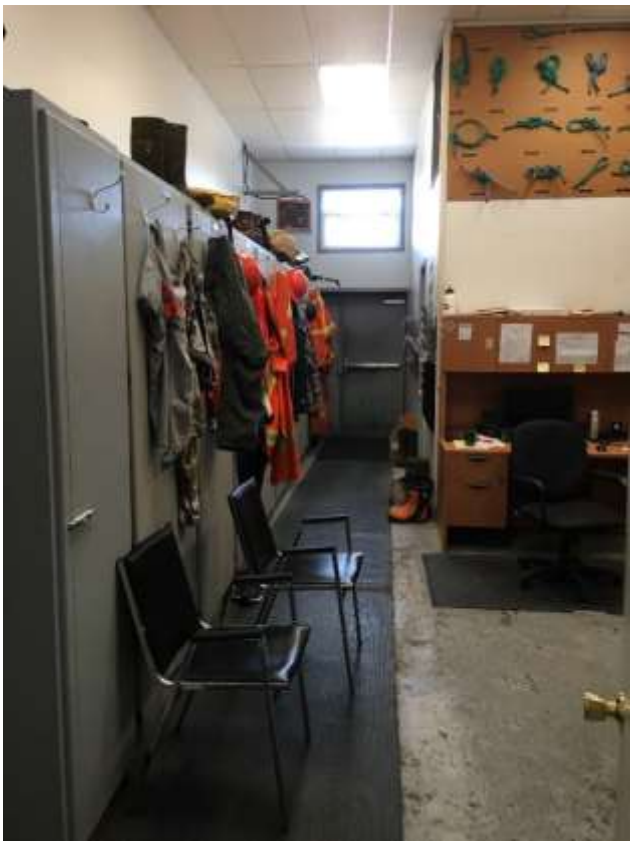
Electrical/communications room. Note stored items hazard.





Shop

Shop





Shop

APPENDIX A

STRUCTURAL PHOTOS



Photo 1



Photo 2

Nalcor Assessments – Stephenville
Structural – Office Building



Photo 3

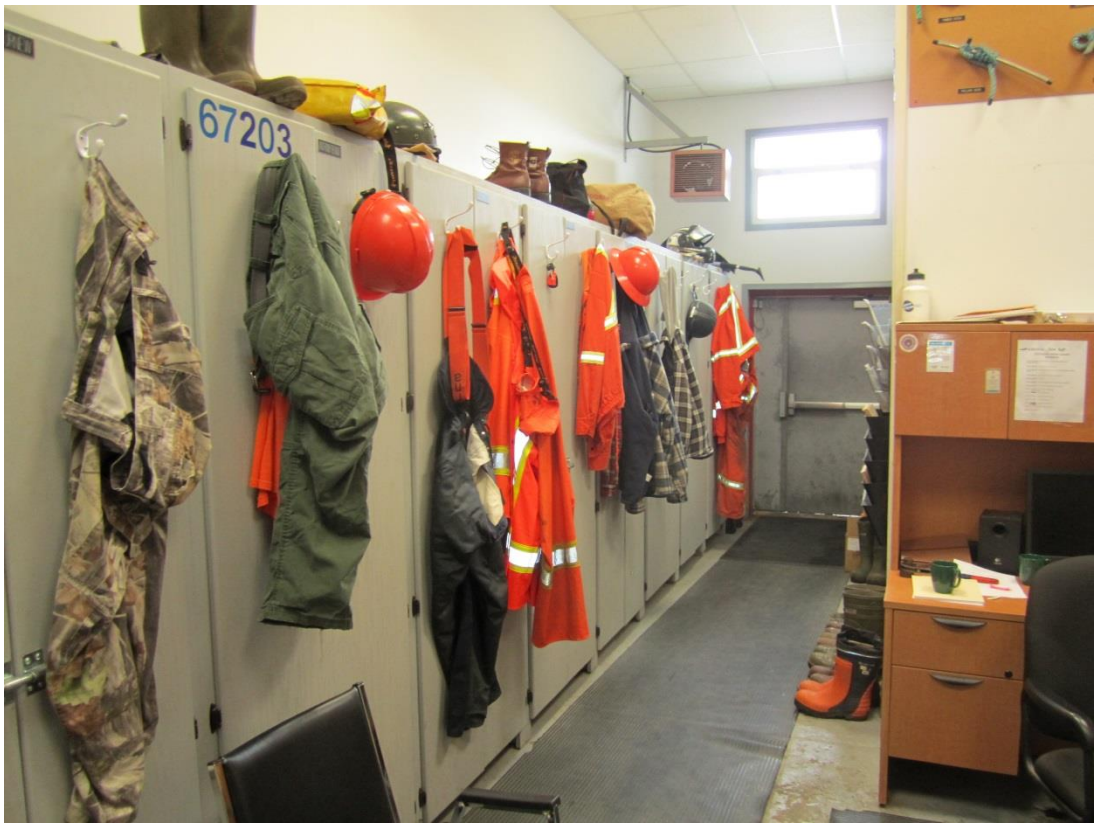


Photo 4

Nalcor Assessments – Stephenville
Structural – Office Building



Photo 5



Photo 6

Nalcor Assessments – Stephenville
Structural – Office Building



Photo 7



Photo 8

Nalcor Assessments – Stephenville
Structural – Office Building



Photo 9



Photo 10

Nalcor Assessments – Stephenville
Structural – Office Building



Photo 11



Photo 12

Nalcor Assessments – Stephenville
Structural – Office Building



Photo 13

APPENDIX A

MECHANICAL PHOTOS

Nalcor Assessments – Stephenville
Mechanical – Office Building



Photo 2



Photo 1

Nalcor Assessments – Stephenville
Mechanical – Office Building



Photo 3

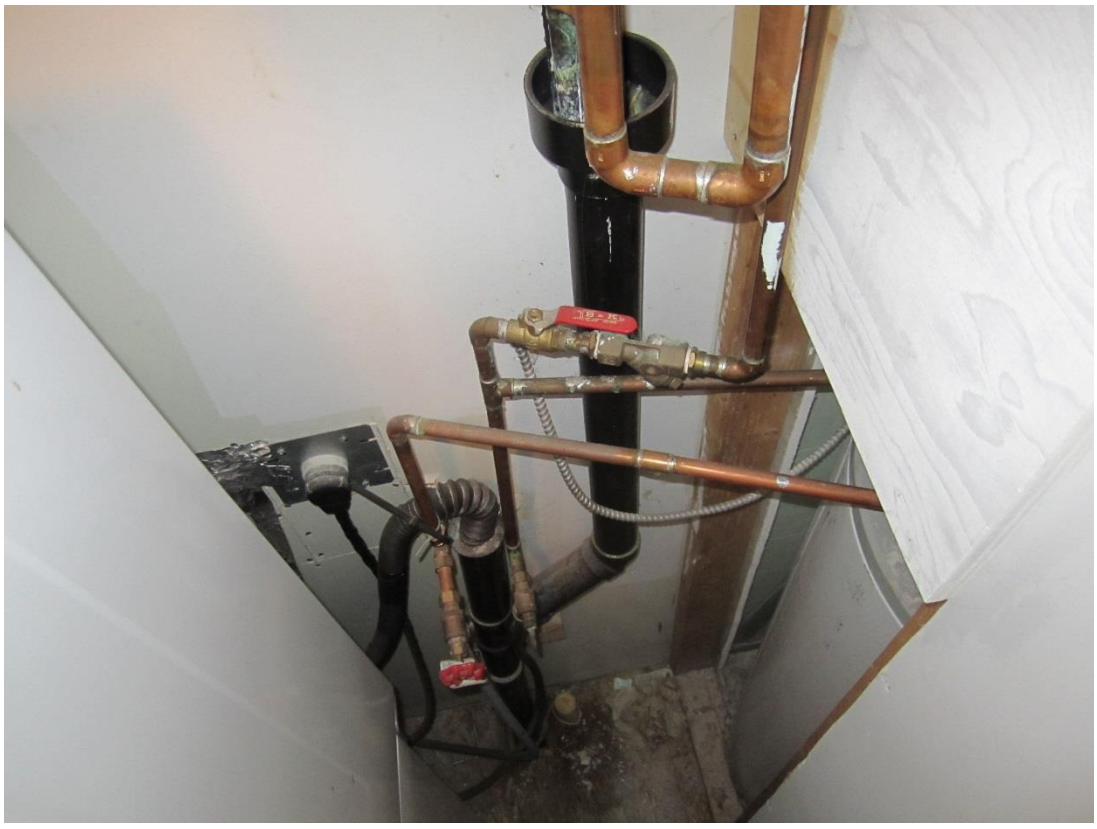


Photo 4

Nalcor Assessments – Stephenville
Mechanical – Office Building



Photo 5

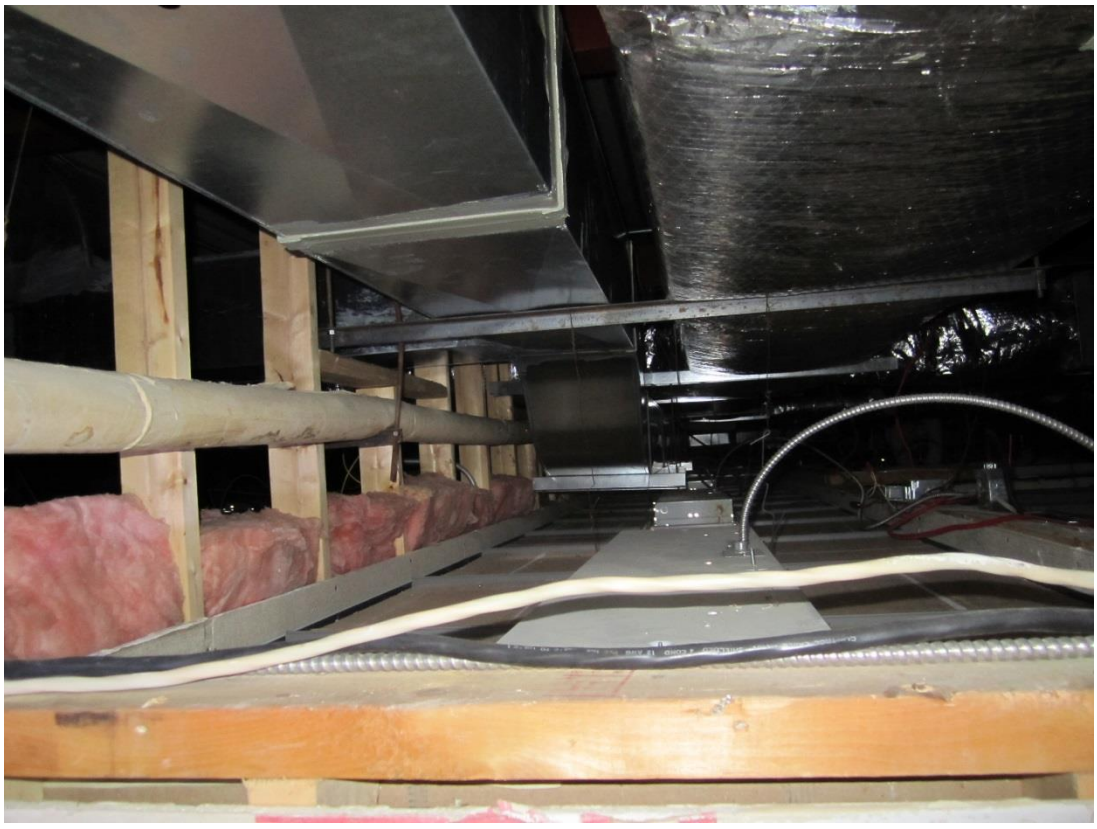


Photo 6



Photo 8



Photo 7



Photo 9



Photo 10



Photo 11



Photo 12

Nalcor Assessments – Stephenville
Mechanical – Office Building



Photo 13



Photo 14

Nalcor Assessments – Stephenville
Mechanical – Office Building



Photo 15



Photo 16

Nalcor Assessments – Stephenville
Mechanical – Office Building



Photo 17



Photo 18

Nalcor Assessments – Stephenville
Mechanical – Office Building



Photo 19



Photo 20

Nalcor Assessments – Stephenville
Mechanical – Office Building



Photo 21



Photo 22

Nalcor Assessments – Stephenville
Mechanical – Office Building



Photo 23

APPENDIX A

ELECTRICAL PHOTOS

Nalcor Assessments – Stephenville
Electrical – Office Building



Photo 1



Photo 2

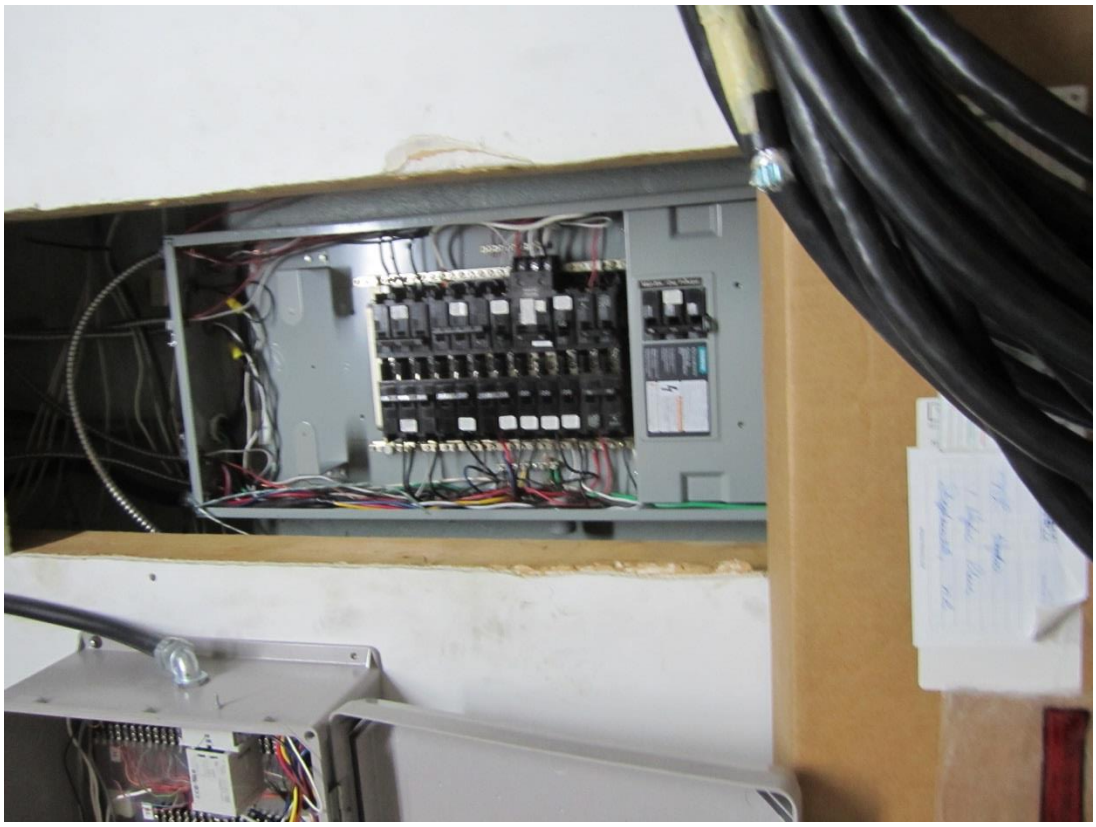


Photo 4



Photo 3

Nalcor Assessments – Stephenville
Electrical – Office Building

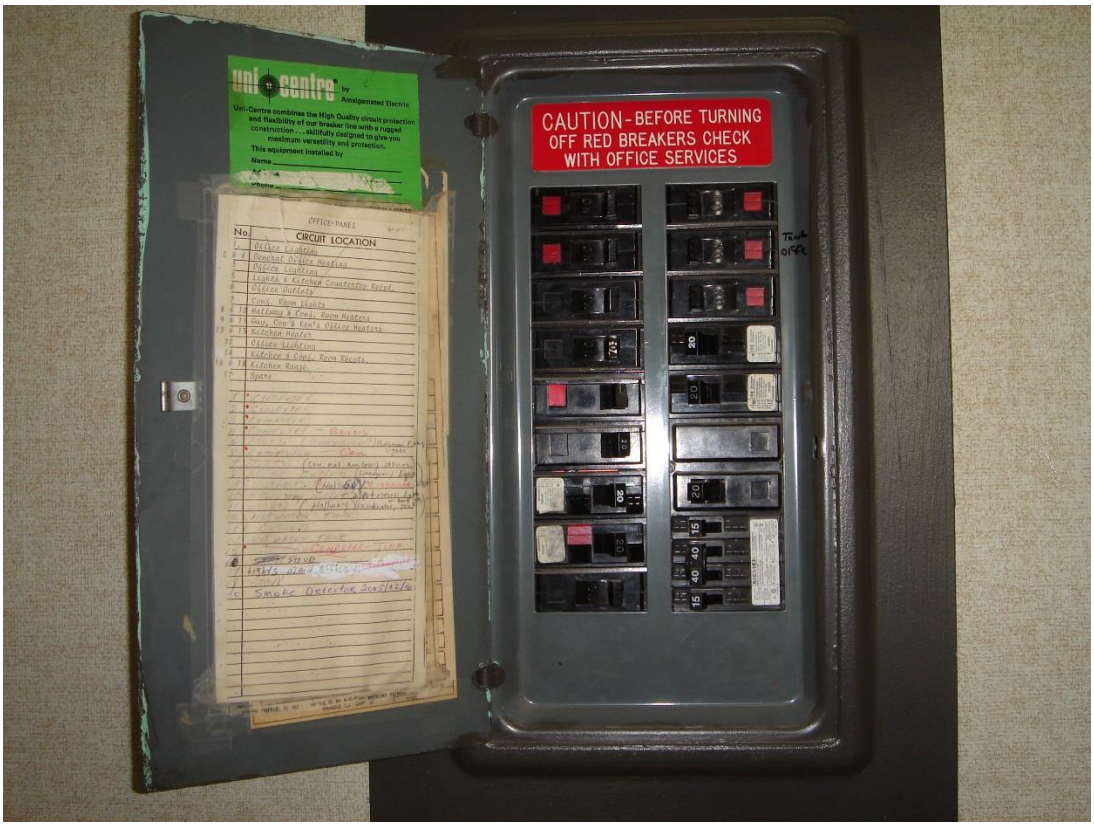


Photo 5



Photo 6

Nalcor Assessments – Stephenville
Electrical – Office Building



Photo 7



Photo 8

Nalcor Assessments – Stephenville
Electrical – Office Building



Photo 9



Photo 10

Nalcor Assessments – Stephenville
Electrical – Office Building



Photo 11

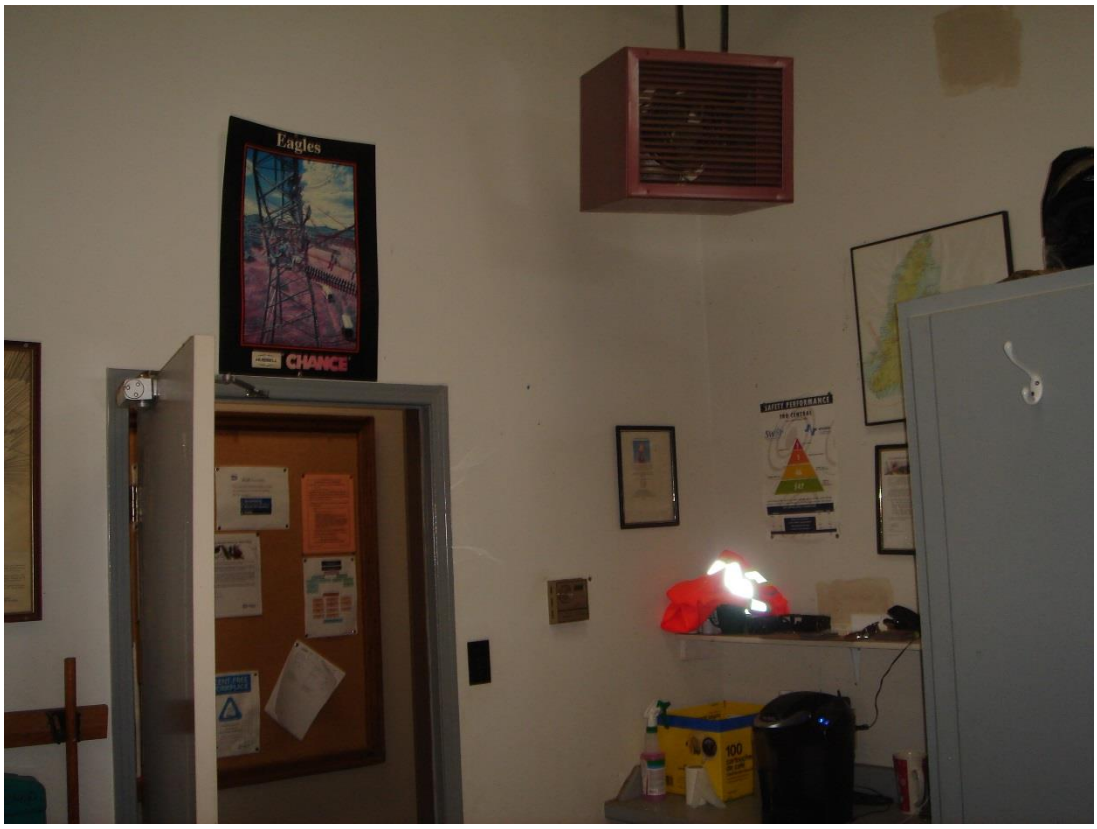


Photo 12

Nalcor Assessments – Stephenville
Electrical – Office Building



Photo 13



Photo 14

Nalcor Assessments – Stephenville
Electrical – Office Building



Photo 15



Photo 16

Nalcor Assessments – Stephenville
Electrical – Office Building



Photo 17

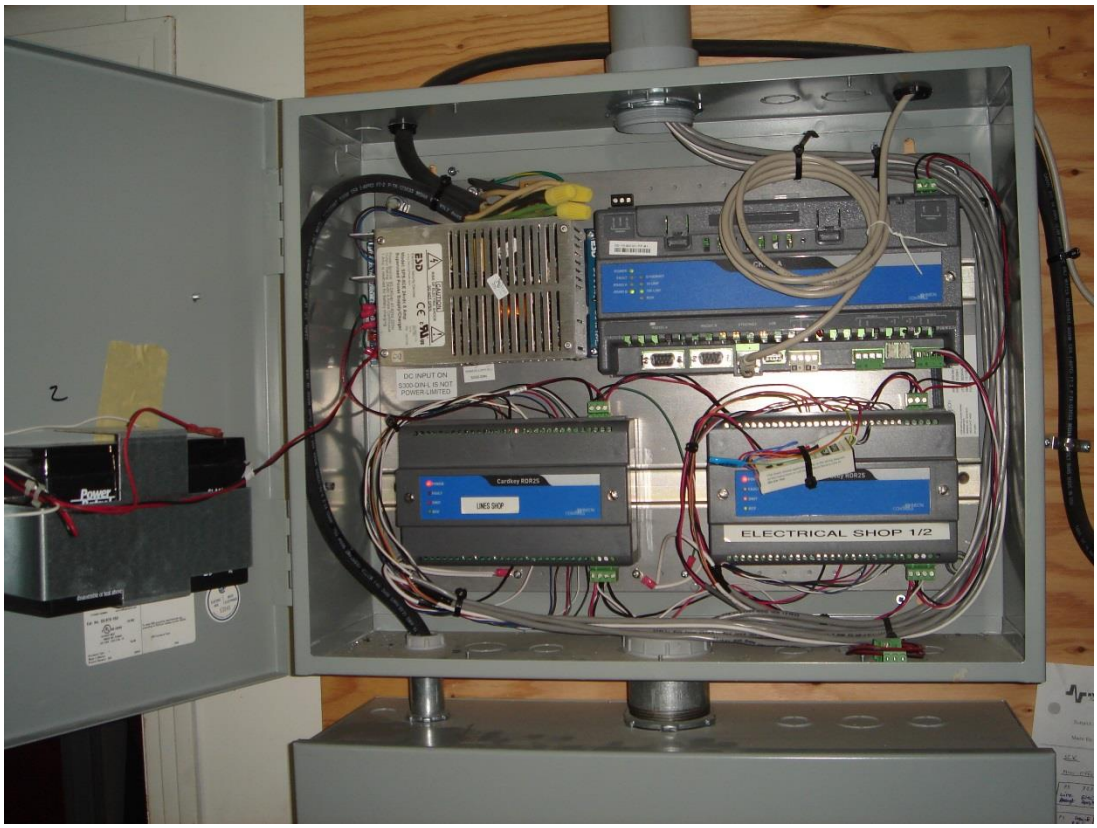


Photo 18

APPENDIX B

Site Photos – Garage

APPENDIX B

ARCHITECTURAL PHOTOS







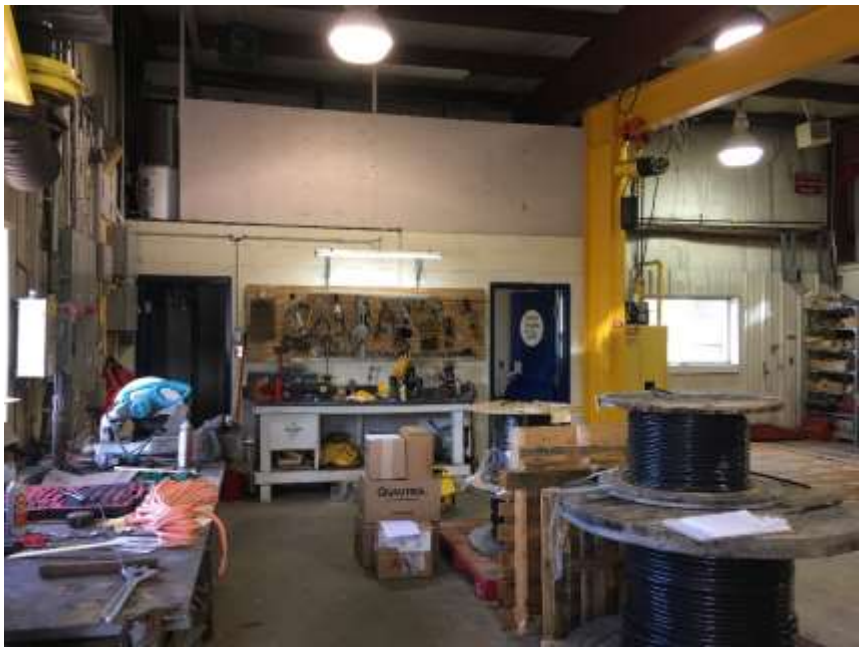
Interior - note service pit.



Rear façade.



Kitchen / Lunch



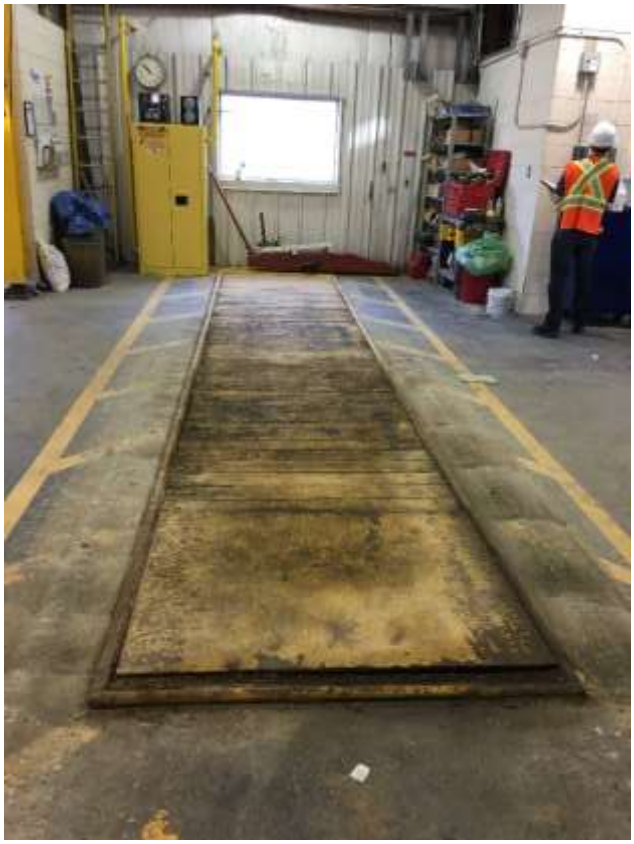
Service area.



Overhead doors.



Washroom



Service pit.

Emergency exit.





Storage mezzanine.

Office



APPENDIX B

STRUCTURAL PHOTOS

Nalcor Assessments – Stephenville
Structural - Garage



Photo 1



Photo 2

Nalcor Assessments – Stephenville
Structural - Garage



Photo 4



Photo 3

Nalcor Assessments – Stephenville
Structural - Garage



Photo 5



Photo 6

Nalcor Assessments – Stephenville
Structural - Garage



Photo 7

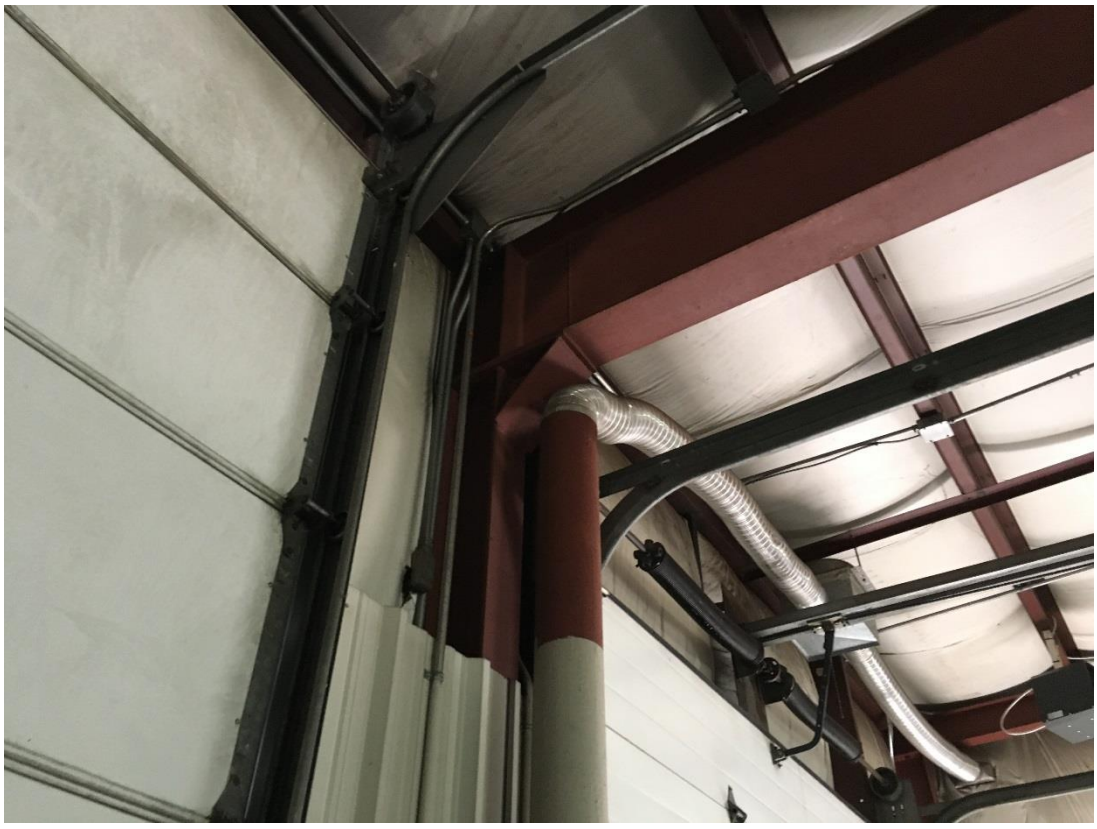


Photo 8



Photo 9



Photo 10



Photo 11

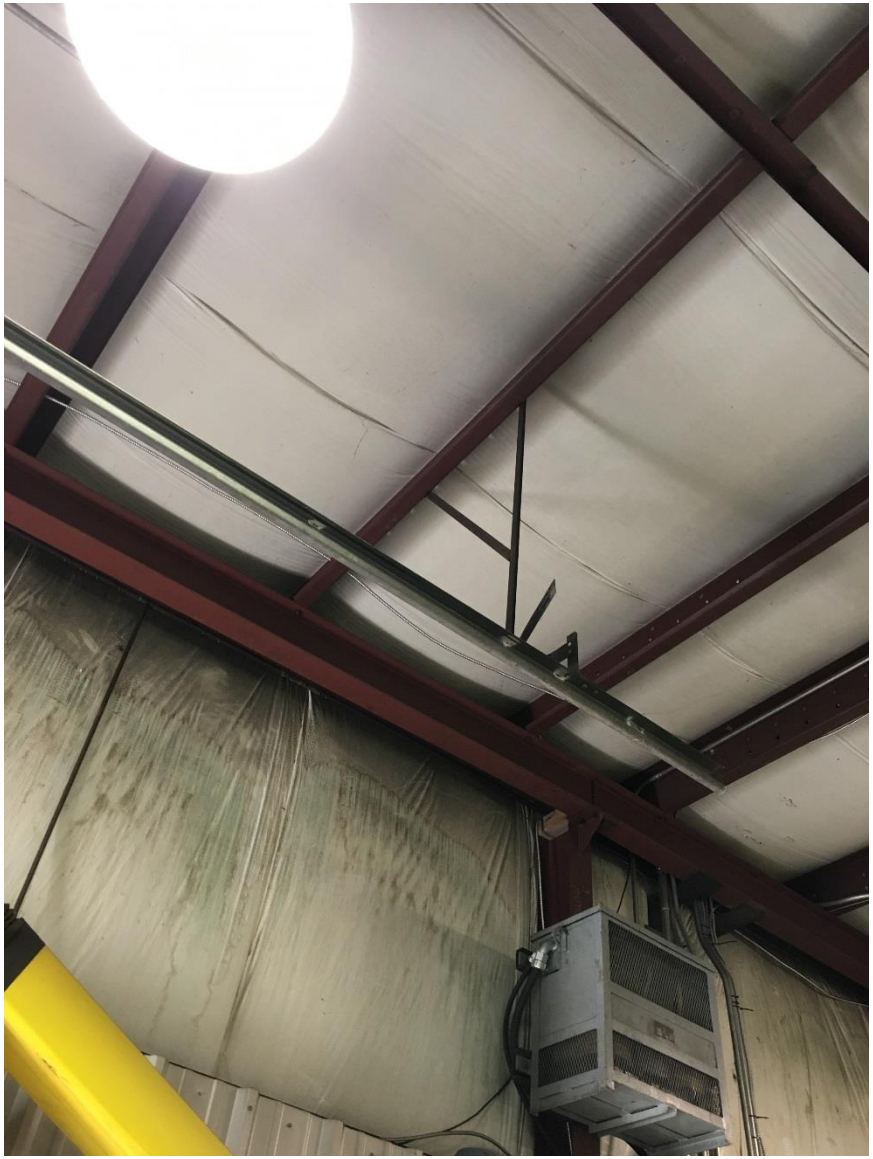


Photo 12

Nalcor Assessments – Stephenville
Structural - Garage



Photo 13



Photo 14

Nalcor Assessments – Stephenville
Structural - Garage



Photo 15



Photo 16

Nalcor Assessments – Stephenville
Structural - Garage

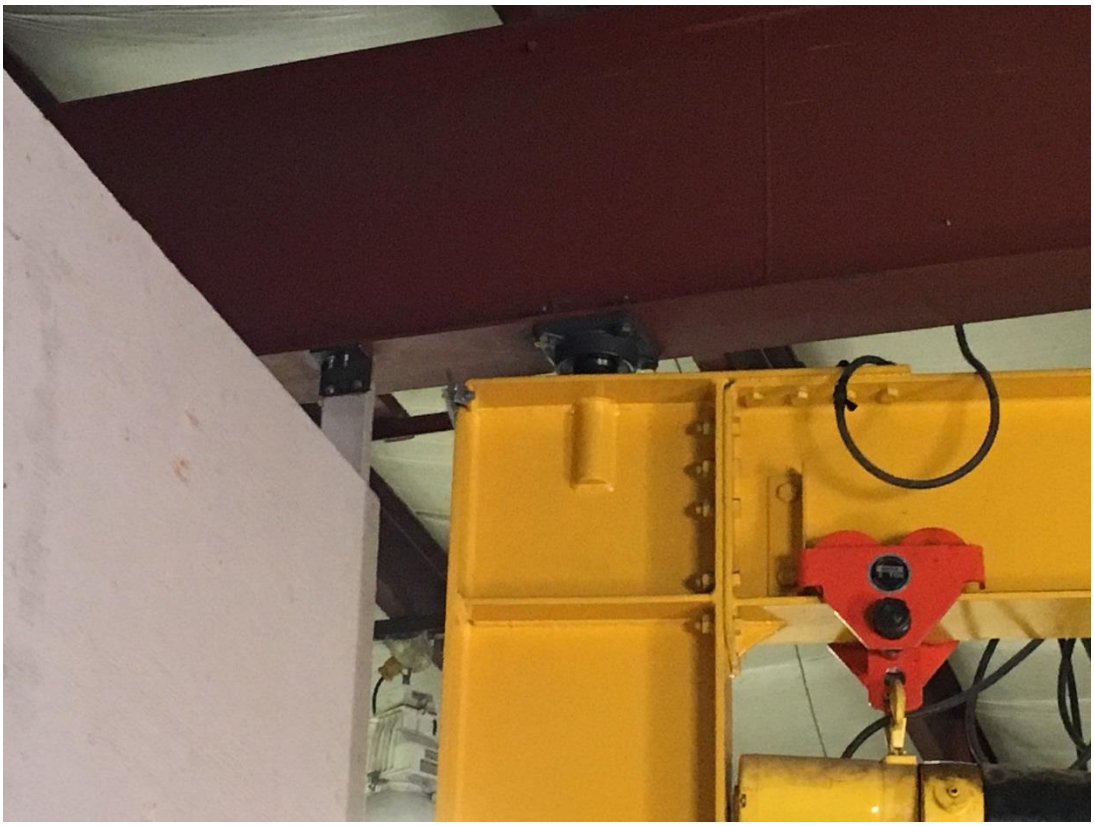


Photo 17



Photo 18



Photo 19



Photo 20

APPENDIX B

MECHANICAL PHOTOS

Nalcor Assessments – Stephenville
Mechanical - Garage



Photo 1



Photo 2

Nalcor Assessments – Stephenville
Mechanical - Garage



Photo 3



Photo 4



Photo 6



Photo 5

Nalcor Assessments – Stephenville
Mechanical - Garage

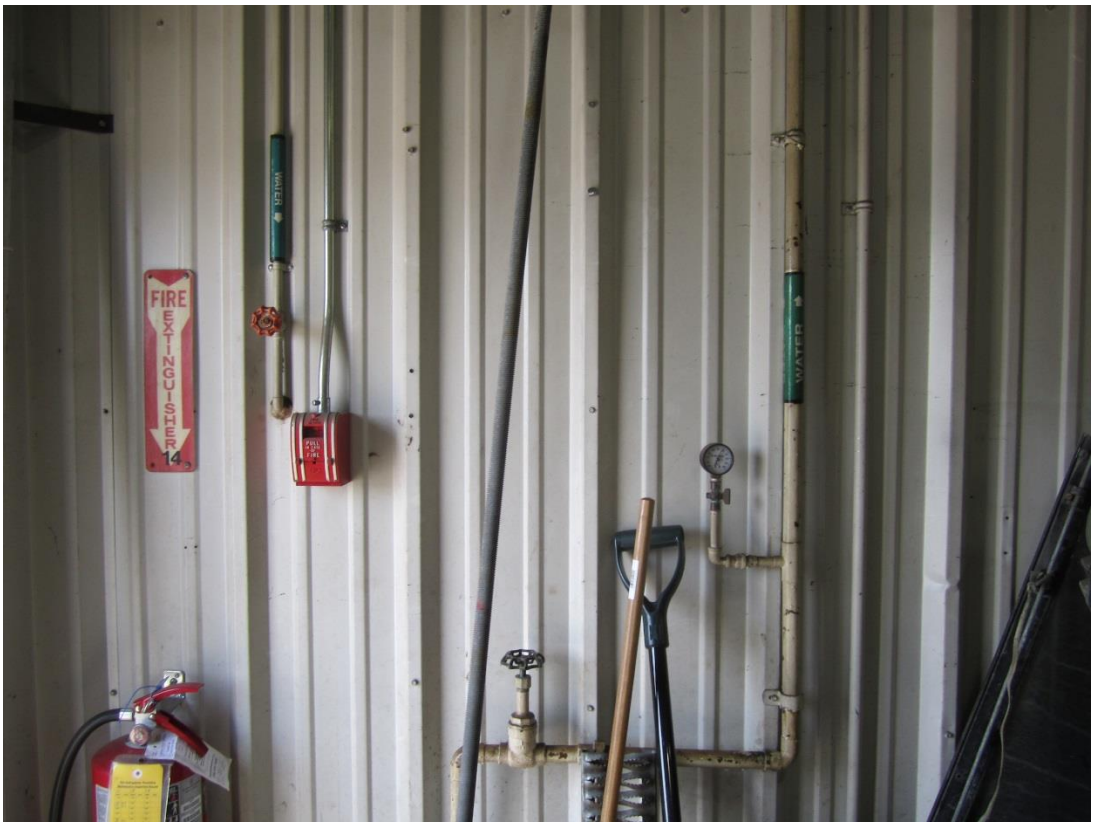


Photo 7



Photo 8

Nalcor Assessments – Stephenville
Mechanical - Garage



Photo 9



Photo 10

Nalcor Assessments – Stephenville
Mechanical - Garage



Photo 11



Photo 12

Nalcor Assessments – Stephenville
Mechanical - Garage



Photo 13

APPENDIX B

ELECTRICAL PHOTOS

Nalcor Assessments – Stephenville
Electrical – Garage



Photo 1



Photo 2

Nalcor Assessments – Stephenville
Electrical – Garage



Photo 3



Photo 4

Nalcor Assessments – Stephenville
Electrical – Garage



Photo 5



Photo 6

Nalcor Assessments – Stephenville
Electrical – Garage



Photo 7

APPENDIX C

Site Photos – Warehouse Building

APPENDIX C

ARCHITECTURAL PHOTOS







Partial front façade.



Partial front façade.



Corroded soffit and paint peeling from cladding.



Rear façade.



Left façade with lean-to in foreground



Interior



Overhead door.

APPENDIX C

STRUCTURAL PHOTOS

Nalcor Assessments – Stephenville
Structural – Warehouse Building



Photo 1

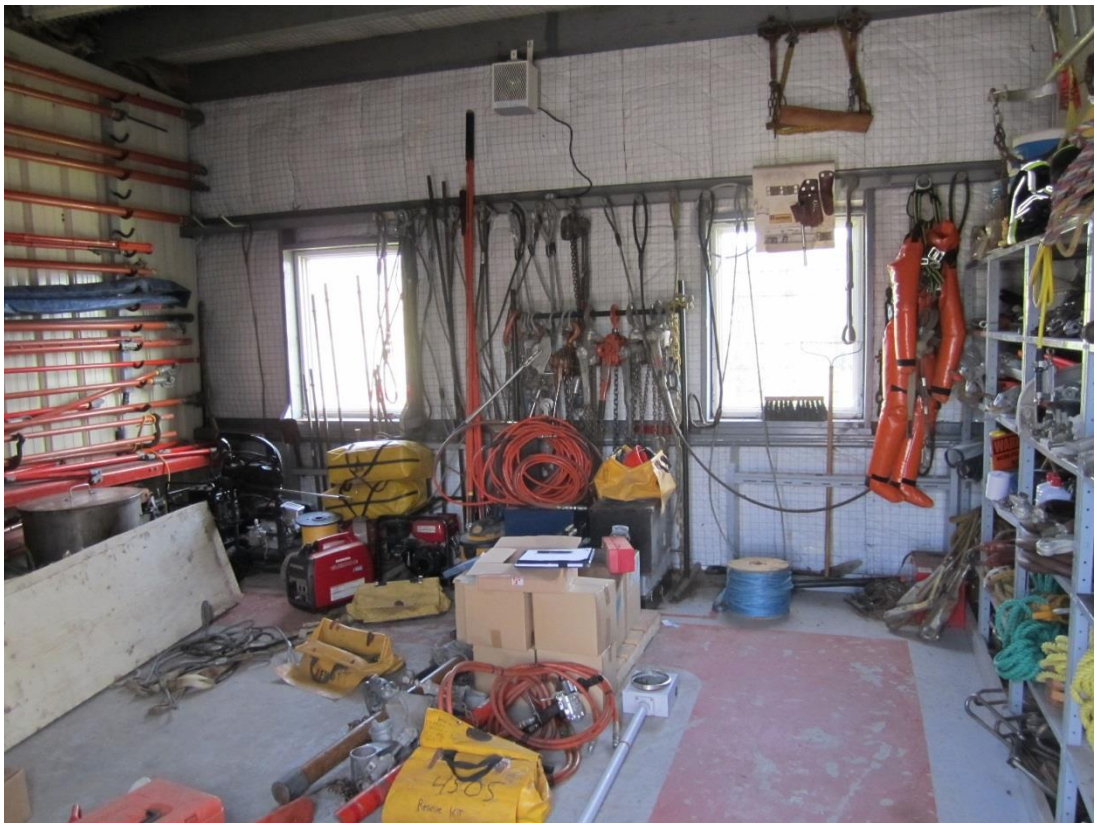


Photo 2

Nalcor Assessments – Stephenville
Structural – Warehouse Building



Photo 3

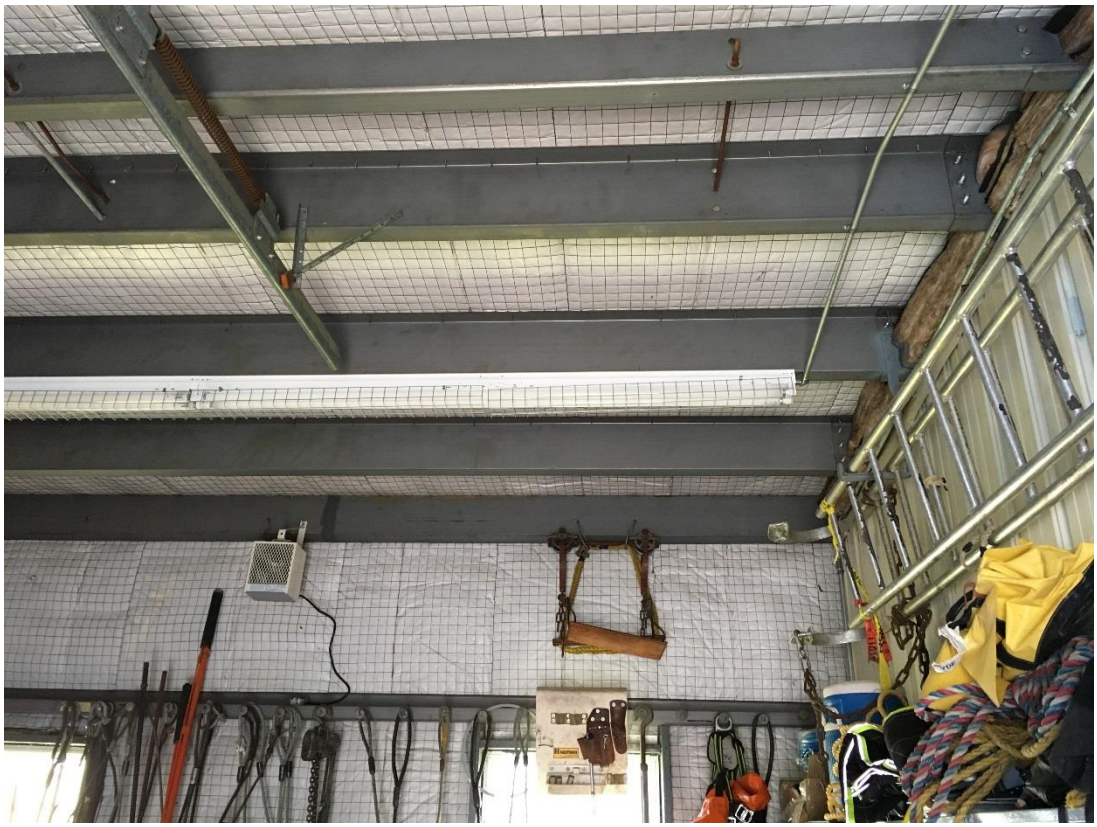


Photo 4

Nalcor Assessments – Stephenville
Structural – Warehouse Building



Photo 5



Photo 6

Nalcor Assessments – Stephenville
Structural – Warehouse Building



Photo 7



Photo 8

Nalcor Assessments – Stephenville
Structural – Warehouse Building



Photo 9



Photo 10

Nalcor Assessments – Stephenville
Structural – Warehouse Building



Photo 11



Photo 12

Nalcor Assessments – Stephenville
Structural – Warehouse Building



Photo 13

APPENDIX C

MECHANICAL PHOTOS

Nalcor Assessments – Stephenville
Mechanical – Warehouse Building



Photo 1



Photo 2

APPENDIX C

ELECTRICAL PHOTOS

Nalcor Assessments – Stephenville
Electrical – Warehouse Building

3

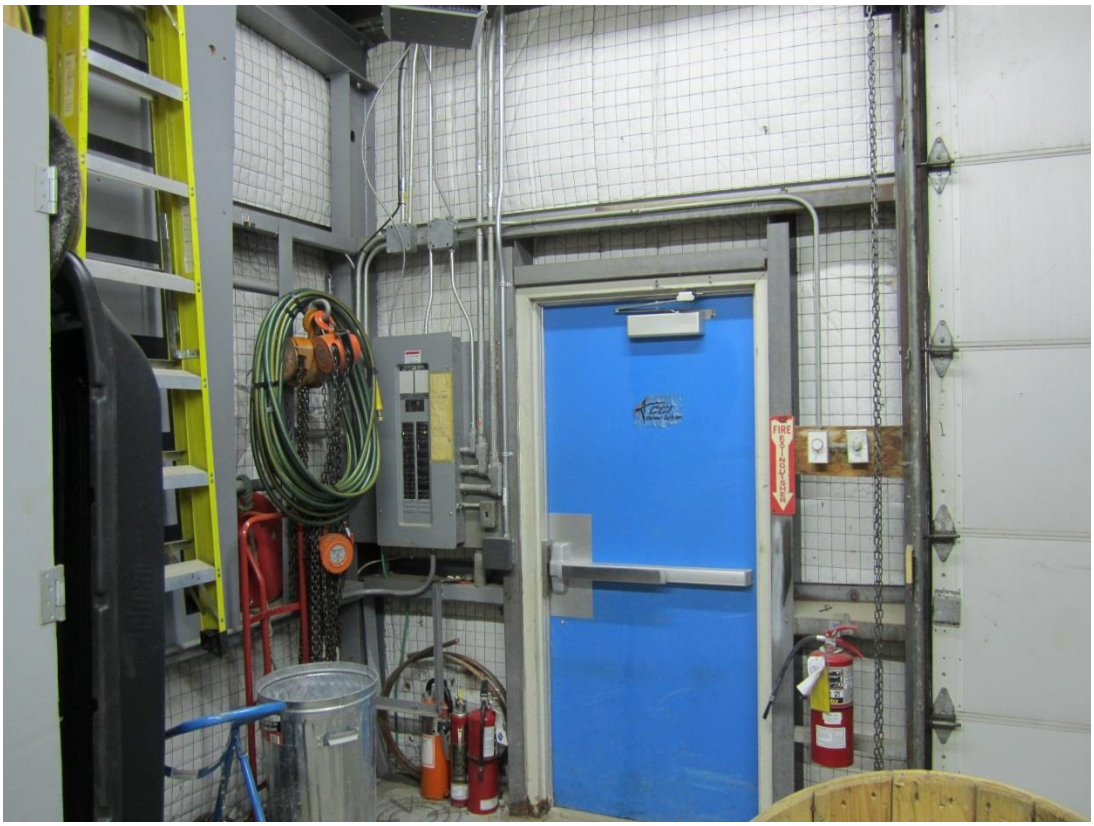


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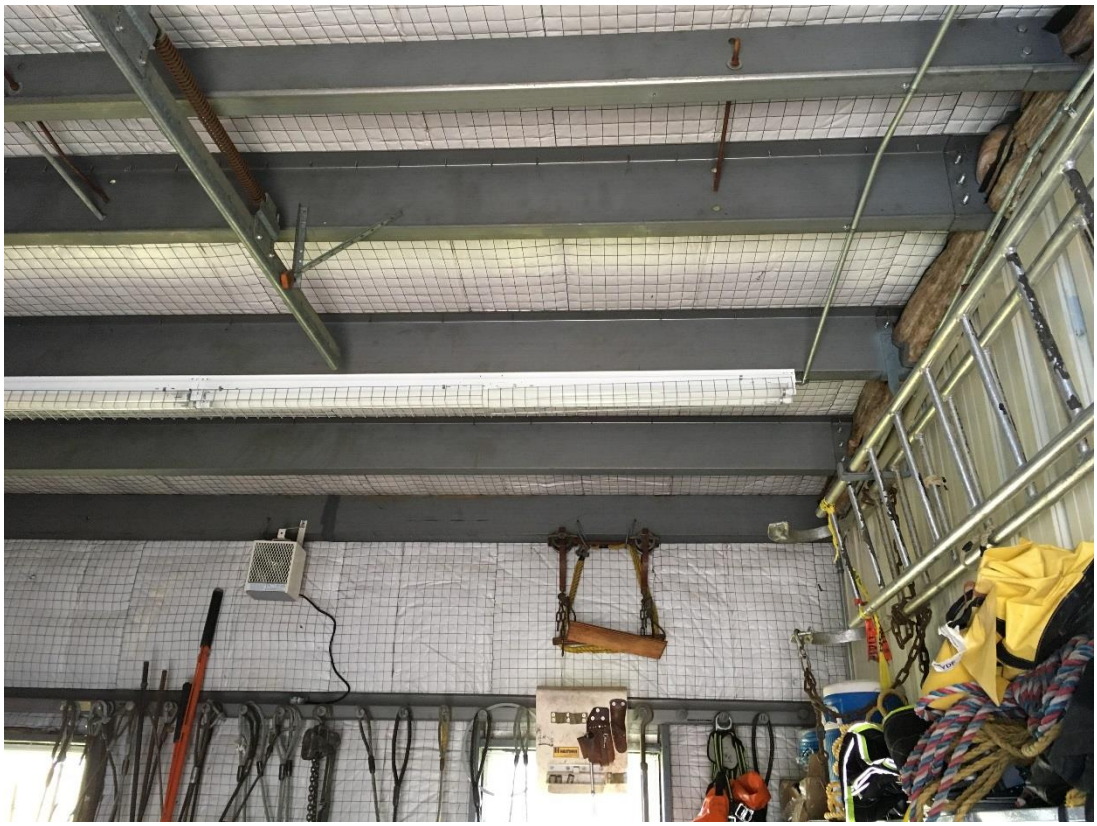


Photo 2

Nalcor Assessments – Stephenville
Electrical – Warehouse Building



Photo 3



Photo 4

APPENDIX D

Site Photos – Storage Shed

APPENDIX D

ARCHITECTURAL PHOTOS

Nalcor Assessments - Stephenville

Archtectural - Storage Shed



Exterior front and right facades.

Rear façade.





Cladding damage.

Attic ventilation.





Surface corrosion on roofing panels.



Interior

APPENDIX D

STRUCTURAL PHOTOS

Nalcor Assessments – Stephenville
Structural – Storage Shed



Photo 1



Photo 2

Nalcor Assessments – Stephenville
Structural – Storage Shed



Photo 3



Photo 4

Nalcor Assessments – Stephenville
Structural – Storage Shed



Photo 5



Photo 6

Nalcor Assessments – Stephenville
Structural – Storage Shed



Photo 7

APPENDIX D

MECHANICAL PHOTOS

Nalcor Assessments – Stephenville
Mechanical – Storage Shed



Photo 1

APPENDIX D

ELECTRICAL PHOTOS

Nalcor Assessments – Stephenville
Electrical – Storage Shed



Photo 1

APPENDIX E

Site Photos – Equipment Storage Platforms

Nalcor Assessments – Stephenville
Structural – Pole Ramps and Equipment Platforms



Photo 1



Photo 2

Nalcor Assessments – Stephenville
Structural – Pole Ramps and Equipment Platforms



Photo 3



Photo 4



Photo 5



Photo 6

Nalcor Assessments – Stephenville
Structural – Pole Ramps and Equipment Platforms



Photo 7



Photo 8

Nalcor Assessments – Stephenville
Structural – Pole Ramps and Equipment Platforms



Photo 9



Photo 10

Nalcor Assessments – Stephenville
Structural – Pole Ramps and Equipment Platforms



Photo 11

APPENDIX F

Site Photos – Site/Civil

Nalcor Assessments – Stephenville
Site Civil Photos



Photo 1



Photo 2

Nalcor Assessments – Stephenville
Site Civil Photos



Photo 3



Photo 4

Nalcor Assessments – Stephenville
Site Civil Photos



Photo 5



Photo 6

Nalcor Assessments – Stephenville
Site Civil Photos



Photo 7



Photo 8

Nalcor Assessments – Stephenville
Site Civil Photos



Photo 9



Photo 10

Nalcor Assessments – Stephenville
Site Civil Photos



Photo 11



Photo 12



Photo 13



Photo 14

Nalcor Assessments – Stephenville
Site Civil Photos



Photo 15



Photo 16

Nalcor Assessments – Stephenville
Site Civil Photos



Photo 17



Photo 18

Nalcor Assessments – Stephenville
Site Civil Photos



Photo 19



Photo 20

Nalcor Assessments – Stephenville
Site Civil Photos



Photo 21



Photo 22

Nalcor Assessments – Stephenville
Site Civil Photos



Photo 23



Photo 24

APPENDIX G

Site Photos – Environmental

Nalcor Assessments – Stephenville
Environmental Photos



Photo 1



Photo 2

Nalcor Assessments – Stephenville
Environmental Photos



Photo 3



Photo 4

Nalcor Assessments – Stephenville
Environmental Photos



Photo 5



Photo 6

Nalcor Assessments – Stephenville
Environmental Photos



Photo 7



Photo 8

Nalcor Assessments – Stephenville
Environmental Photos



Photo 9



Photo 10

Nalcor Assessments – Stephenville
Environmental Photos



Photo 11



Photo 12



Photo 13



Photo 14

Nalcor Assessments – Stephenville
Environmental Photos



Photo 16



Photo 15

Nalcor Assessments – Stephenville
Environmental Photos



Photo 17



Photo 18



Photo 20



Photo 19

Nalcor Assessments – Stephenville
Environmental Photos



Photo 22



Photo 21

Nalcor Assessments – Stephenville
Environmental Photos



Photo 23



Photo 24

Nalcor Assessments – Stephenville
Environmental Photos



Photo 25



Photo 26

Nalcor Assessments – Stephenville
Environmental Photos



Photo 27



Photo 28

Nalcor Assessments – Stephenville
Environmental Photos



Photo 29



Photo 30

Nalcor Assessments – Stephenville
Environmental Photos



Photo 31



Photo 32

Nalcor Assessments – Stephenville
Environmental Photos



Photo 33



Photo 34

Nalcor Assessments – Stephenville
Environmental Photos



Photo 35



Photo 36

Nalcor Assessments – Stephenville
Environmental Photos



Photo 37



Photo 38

Nalcor Assessments – Stephenville
Environmental Photos



Photo 39



Photo 40

Nalcor Assessments – Stephenville
Environmental Photos



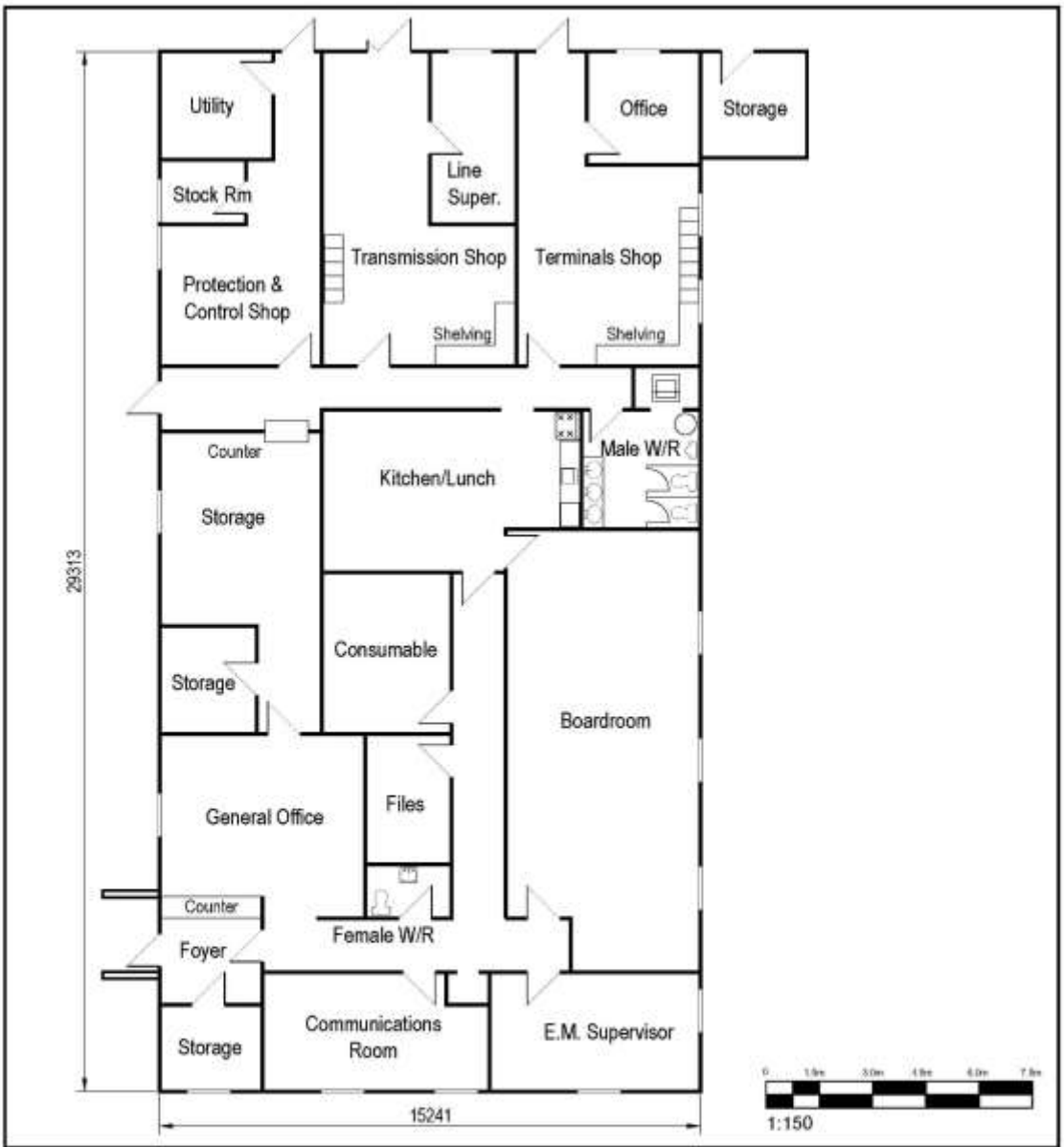
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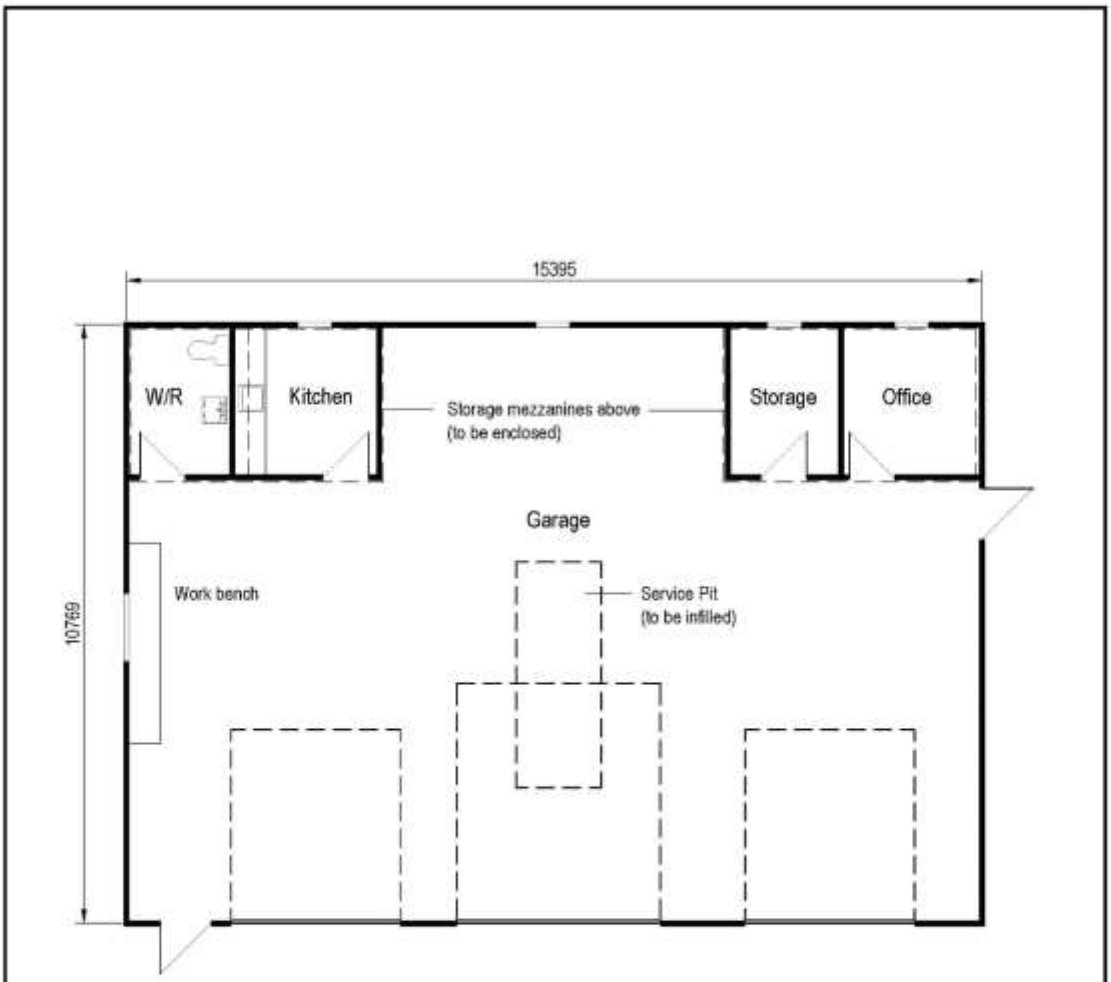


Photo 42

APPENDIX H

Existing Floor Plans


Utility
Stock Rm
Protection & Control Shop
Line Super.
Transmission Shop
Shelving
Terminals Shop
Shelving
Office
Storage
Counter
Storage
Kitchen/Lunch
Male W/R
Consumable
Storage
Boardroom
General Office
Files
Counter
Foyer
Female W/R
Storage
Communications Room
E.M. Supervisor
29313
15241
1:150
PRIME CONSULTANT:
CBCL LIMITED
Consulting Engineers
ARCHITECTURAL CONSULTANT:
GLENN BARNES
ARCHITECTURE INC.
PROJECT:
BUILDING & INFASTRUCTURE CONDITION ASSESSMENTS FOR LINE DEPOTS, OFFICE FACILITIES AND CONTROL BUILDINGS
DRAWING TITLE:
SCHEMATIC AS-BUILT PLAN
LINE DEPOT
STEPHENVILLE
NL
CLIENT:
NL HYDRO
SCALE: 1:150
DATE: AUG/17
CLIENT NO.: 70249 AB
PROJECT NO.: 173034.00
DRAWING NO.: SK-4 RA



PRIME CONSULTANT:
CBCL LIMITED
Consulting Engineers
107 KENMOUNT ROAD
ST. JOHN'S, NL A1B 3P9
Phone: (709) 364-6823
Fax: (709) 364-9827

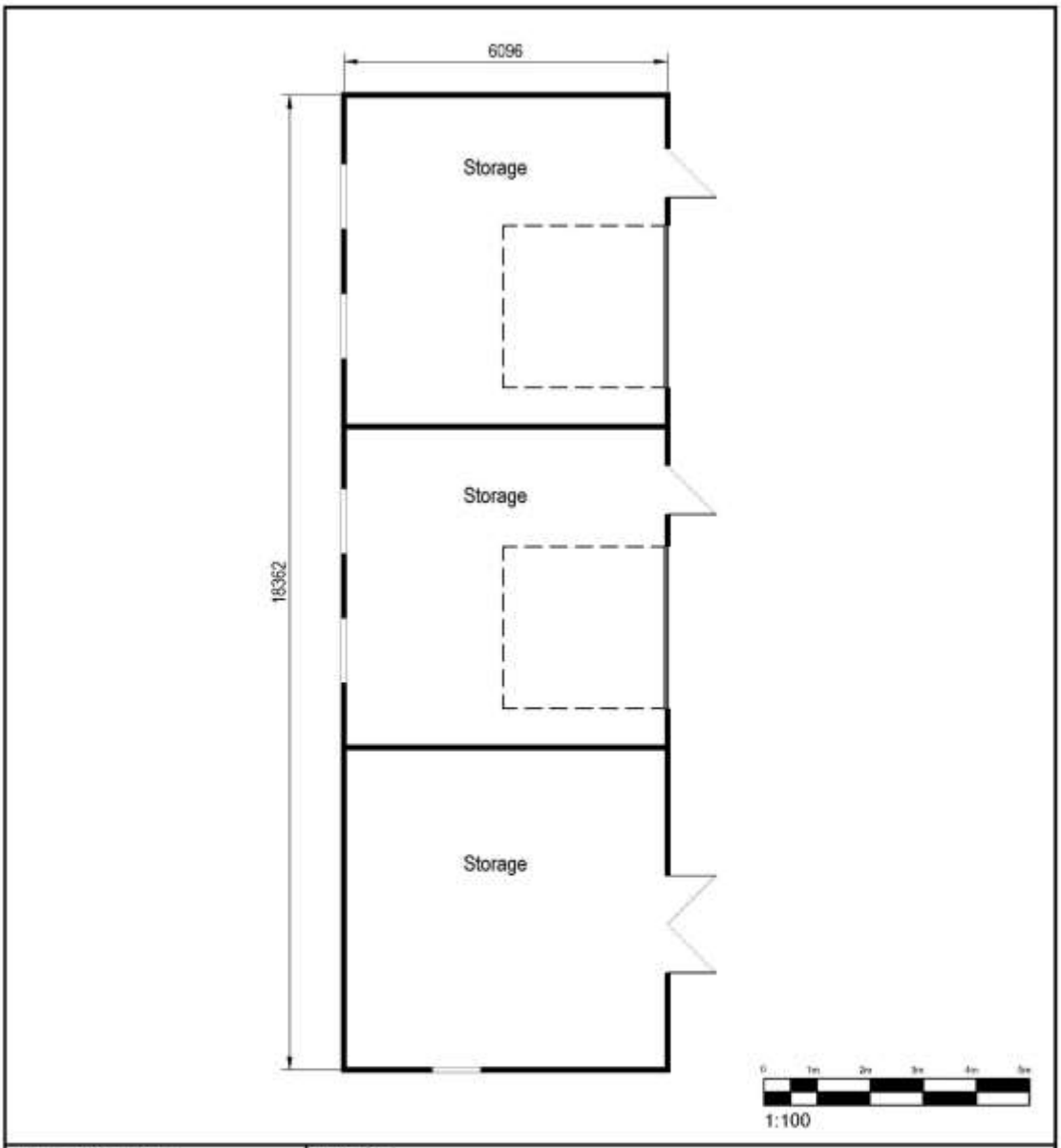
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GLENN BARNES
ARCHITECTURE INC.

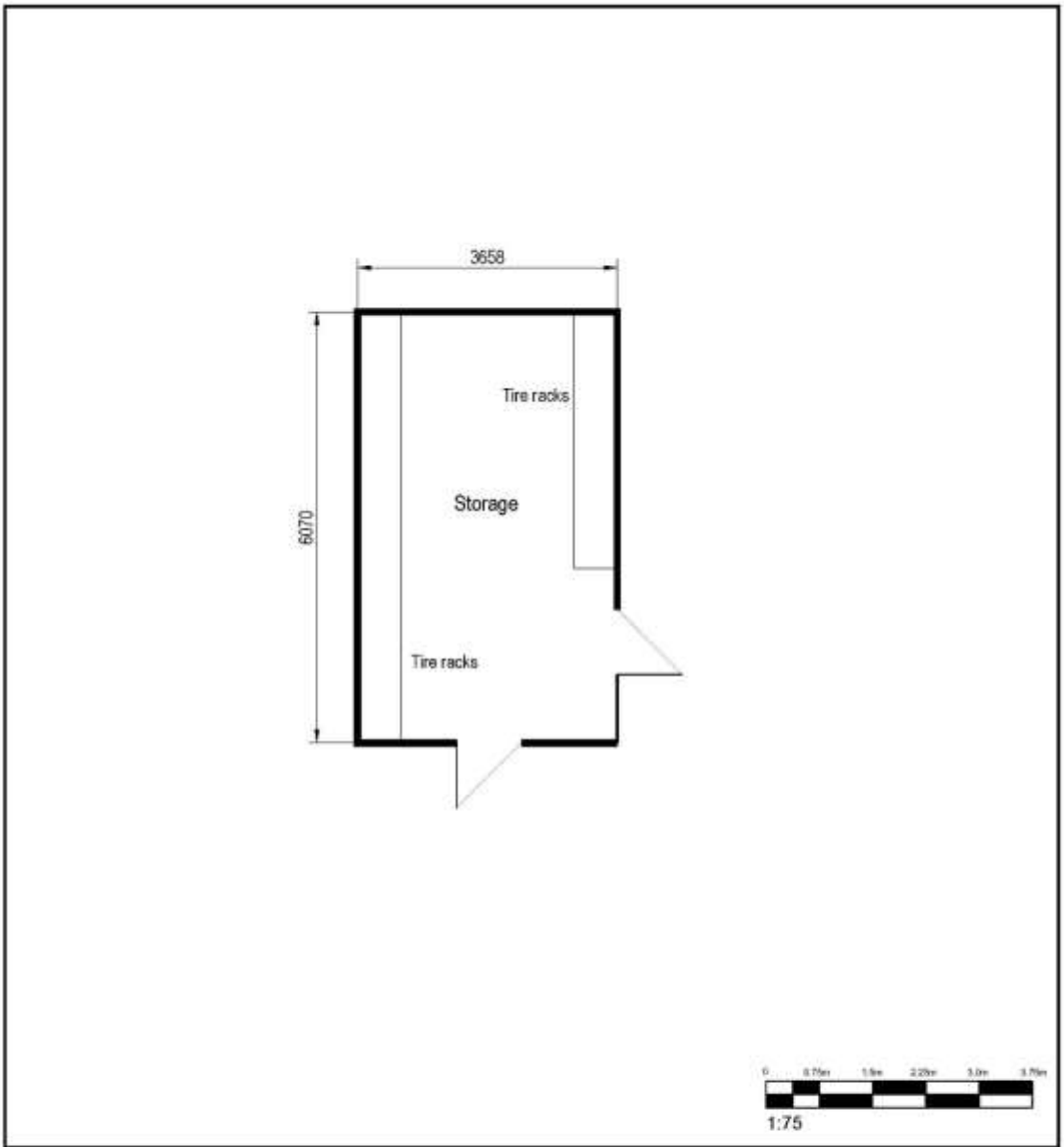
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BUILDING & INFASTRUCTURE CONDITION ASSESSMENTS FOR LINE DEPOTS, OFFICE FACILITIES AND CONTROL BUILDINGS

DRAWING TITLE:
SCHEMATIC AS-BUILT PLAN
MAINTENANCE GARAGE
STEPHENVILLE NL

CLIENT:
NL HYDRO

SCALE:	DATE:	CLIENT NO.:	PROJECT NO.:	DRAWING NO.:
1:100	AUG/17	70249 AB	173034.00	SK-2 RA


6096
18362
Storage
Storage
Storage
1:100
PRIME CONSULTANT:
CBCL LIMITED
Consulting Engineers
ARCHITECTURAL CONSULTANT:
GLENN BARNES
ARCHITECTURE INC.
PROJECT:
BUILDING & INFASTRUCTURE CONDITION ASSESSMENTS FOR
LINE DEPOTS, OFFICE FACILITIES AND CONTROL BUILDINGS
DRAWING TITLE:
SCHEMATIC AS-BUILT PLAN
WAREHOUSE BUILDING
STEPHENVILLE
NL
CLIENT:
NL HYDRO
SCALE:
1:100
DATE:
AUG/17
CLIENT NO.:
70249 AB
PROJECT NO.:
173034.00
DRAWING NO.:
SK-3
R A



PRIME CONSULTANT:
CBCL LIMITED
Consulting Engineers
ARCHITECTURAL CONSULTANT:
GLENN BARNES
ARCHITECTURE INC.

PROJECT:
BUILDING & INFASTRUCTURE CONDITION ASSESSMENTS FOR LINE DEPOTS, OFFICE FACILITIES AND CONTROL BUILDINGS

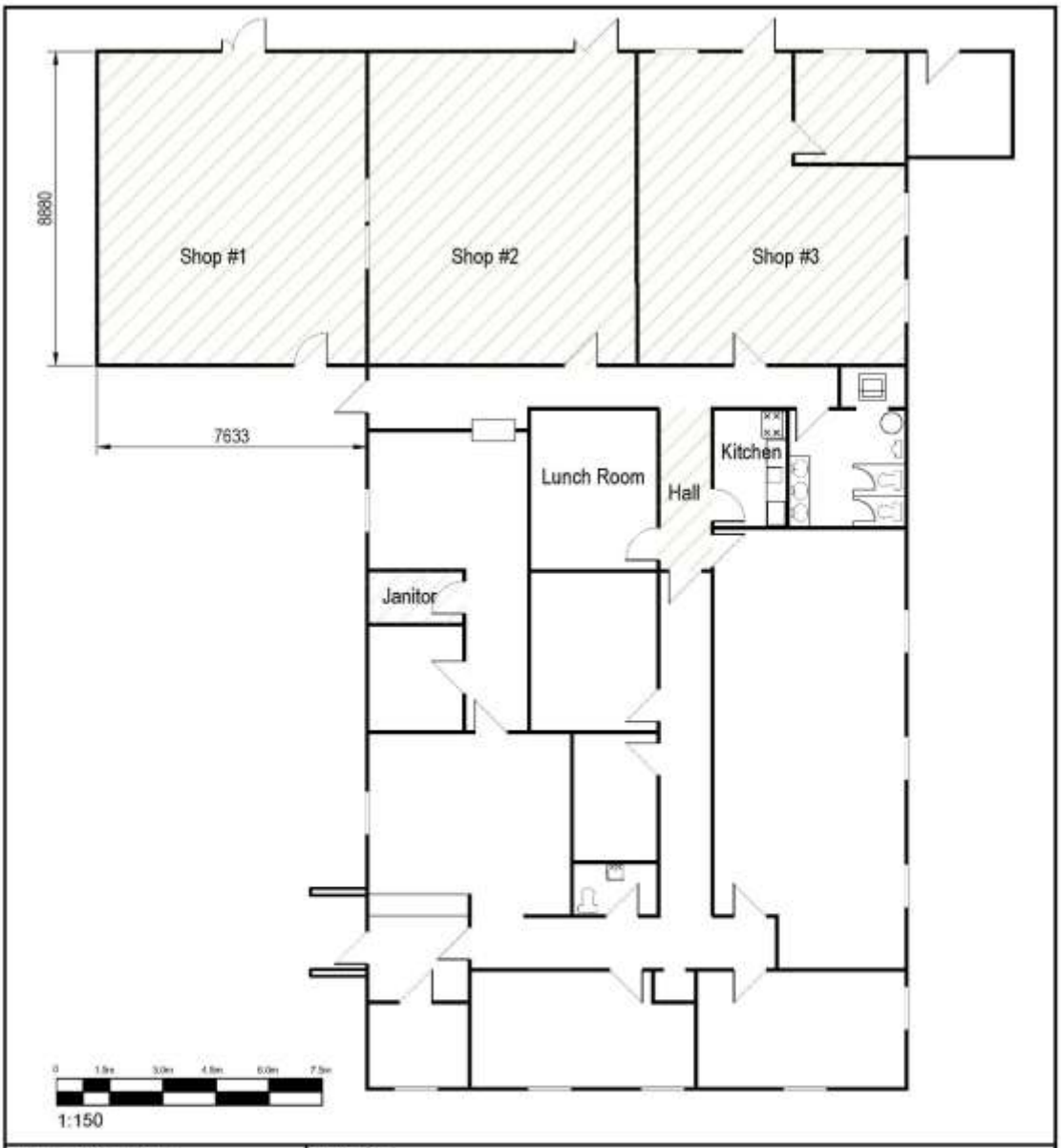
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CLIENT:
NL HYDRO

SCALE:	DATE:	CLIENT NO.:	PROJECT NO.:	DRAWING NO.:
1:75	AUG./17	70249 AB	173034.00	SK-1 R A

APPENDIX I

Concept Floor Plans


8880
Shop #1
Shop #2
Shop #3
7633
Lunch Room
Hall
Kitchen
Janitor
1:150
PRIME CONSULTANT:
CBCL LIMITED
Consulting Engineers
ARCHITECTURAL CONSULTANT:
GLENN BARNES
ARCHITECTURE INC.
PROJECT:
BUILDING & INFASTRUCTURE CONDITION ASSESSMENTS FOR
LINE DEPOTS, OFFICE FACILITIES AND CONTROL BUILDINGS
DRAWING TITLE:
SCHEMATIC REVISED FLOOR PLAN
LINE DEPOT
STEPHENVILLE
NL
CLIENT:
NL HYDRO
SCALE:
1:150
DATE:
AUG/17
CLIENT NO.:
70249 AB
PROJECT NO.:
173034.00
DRAWING NO.:
SK-4A
RA

Appendix E

Building and Infrastructure Condition Assessment – Bishop's Falls Office/Warehouse (2017)





Building and Infrastructure Condition Assessment Bishops Falls Office/Warehouse

(Bishops Falls, NL)



163046.00 ● Final Report ● March 2017

ISO 9001
Registered Company

Prepared for:

nalcor energy

Prepared by:

CBCL LIMITED
Consulting Engineers

Issued for Final	Paul Sceviour	Mar 31, 2017	Paul Sceviour
Issued for Review	Paul Sceviour	Oct 28, 2016	Paul Sceviour
Issue or Revision	***Reviewed By:***	***Date***	***Issued By:***

CBCL LIMITED
Consulting Engineers

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ISO 9001
Registered Company

REGISTERED PROFESSIONAL ENGINEER
PAUL SCEVIOUR
SIGNATURE
MAR 31, 2017
DATE
NEWFOUNDLAND & LABRADOR

CBCL Project No 163046.00

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CHAPTER 1 REPORT OVERVIEW

1.1 RFP and Consultant Group

In June 2016, the Newfoundland and Labrador Hydro (referred to as the "NLH" hereafter) issued a Request for Proposals to undertake the building and infrastructure condition assessments for various line depots, office facilities, and substation control buildings throughout the province. The sites included:

- Line Depots
  - Ramea
  - Flowers Cove
  - Roddickton
- Office Facilities and Control Buildings
  - Bishop's Falls (Office Building Only)
  - Whitburn Eastern Area Depot
  - Doyles 138 kV Facility
  - Grandy Brook 138 kV Facility
  - Howley 138 kV Facility
  - Springdale 138 kV Facility

CBCL Limited responded to the request on May 27, 2016, and was subsequently awarded the project on June 15, 2016.

The consultant team that performed this assessment consisted of a multi-disciplined engineering team with CBCL Limited performing structural, mechanical, electrical, and environmental tasks, and Glenn Barnes Architecture Inc. performing architectural and functional programming tasks.

This report contains the results of those exercises and provides our professional assessments, recommendations as to the current condition, suitability of use, required code upgrades, recommended upgrades, recommendations to suit future needs, and opinion of probable construction cost for recommendations.

1.2 Scope of Work

The Request for Proposals document contained the terms of reference which outlined the objectives and scope of the project. The assessment has several objectives:

- to review the general condition of the building and site infrastructure including architectural, structural, mechanical, electrical, and environmental;
- provide recommendations of renovations to continue operating existing facilities in view of present and future needs, and
- provide preliminary functional programming based on the client current needs (for storage, operations, etc.) and future needs to determine the most efficient uses of the assessed facilities.

1.3 Site Audits

Site audits were carried out during the weeks of July 25th and August 1st. Prior to the site work, CBCL requested any available plans and prior documents or information on the facilities. Limited information was available so the bulk of the information contained in this report was obtained from onsite review and from information provided by on site personnel. Upon arriving at the various sites the consultant team checked in with site personnel and undertook site specific safety orientation were required.

1.3.1 Bishops Falls Office/Warehouse

The office/warehouse building is located on a large compound housing several buildings, parking areas, and equipment storage yard.





This 3,100 square meter footprint two level office/warehouse building was constructed circa 1980. The building is a combination pre-engineered metal and conventional steel frame structure. The building houses a large office wing with staff lunch areas plus a warehouse which provides supply to Newfoundland and Labrador Hydro's operations throughout most of the Province. The rear of the warehouse is a former transformer shop where they are now stored and de-commissioned. Two mezzanines are located within the warehouse envelope with one housing offices, training and storage and the other a staff lunch room and clothing testing and cleaning. The building is clad in a combination of clay face brick at the office wing and vertical metal siding elsewhere. The office wing roofing is traditional built up pitch and gravel style. Warehouse roofing is standing seam metal. Windows are bronze colour finished aluminum in the original office portion of the building and vinyl in an office extension and warehouse portion of the building. Exterior personnel

doors are both aluminum and hollow metal in aluminum and pressed steel frames. Overhead doors are both original multi leaf vertical stack steel and new insulated pre-painted steel.

The office/warehouse building is connected to municipal water services and sanitary drainage is to two onsite septic systems. The site itself is a combination of asphalt surfaces with curbs, gravel in storage yard area, and grassed areas. Storm drainage from paved areas is through an underground storm system. The remainder of the site drains from sloped surfaces. The compound is fully fenced with a motorized security gate.

1.4 Findings and Recommendations

1.4.1 Findings

The building envelope is showing its age and requires upgrading including replacement of windows and siding, repair of canopies etc. Interiors are in good condition but require code upgrades related to fire separations, ratings and exiting between offices and warehouse and within office and warehouse spaces. Current fire ratings are minimal. The building has another 25 years useful life if properly maintained and upgraded where required.

Structural issues were noted including potential overstressing of a column in the warehouse area which should be addressed.

Many of the building mechanical systems while currently operational are approaching the end of their useful lives and should be planned for replacement. Code issues should also be addressed in the near term.

The facility is generally good condition electrically. There are some code issues to be addressed as well as equipment replacement that should be planned for near, mid and long term.

1.4.2 Recommendations

Near term recommendations that should be planned to be undertaken within the next two years have been put forward for architectural, structural, site, mechanical, electrical, and environmental and are summarized as follows.

Architectural:

- Provide fire rated floors for mezzanines.
- Provide new fire exits and upgrade existing deficient exits.
- Replace aluminum window glazing units which have delaminated film.
- Repair damaged door canopies.
- Paint exterior doors and frames.
- Repair minor brick damage.
- Consider `practical` accessibility provisions.

Structural:

- Repairs need to be carried out on concrete foundation wall at vertical cracks (8 locations)

- A structural analysis of the building frames should be conducted. Given the deformation of a column located in the warehouse area, there is a possibility that the building frames could be overstressed. If an analysis is not desired, the deformed/twisted column should be removed and replaced with a new column.
- Localized column repairs should be carried out. Within the warehouse area of the building there are seven (7) locations where columns are damage due to equipment impact.
- The brick shelf angles on the back wall should be repaired. Although the brick veneer is only small the shelf angles are in poor condition.
- The small equipment pad accessing the storage tanks at the rear of the building should be removed and replaced with a proper platform.

Site/Civil:

- Areas of decomposing asphalt should be cutout and patched or utilize grind and patch repairs.
- Catch basins should have silt, stand, and stone removed from the chambers.
- Catch basins that are below finished grade should be provided with grate risers to bring them up to grade level and new asphalt placed around them.

Mechanical:

- Modify Lunch Room sink vent piping to be code compliant.
- Modify plumbing vent piping that penetrates exterior walls to penetrate roof.
- Have Truck Bay trench drain cleaned and snaked to make functional again.
- Provide backflow prevention on domestic water takeoff.
- Properly insulate domestic water piping.
- Provide proper supports for domestic water piping.
- Replace any hot water tanks older than 10 years of age.
- Provide backflow preventer on water barrel fill pipe.
- Replace the office area rooftop air conditioning unit.
- As an option utilize variable volume in the new rooftop unit and install variable volume air terminal zone units with digital controls.
- Replace the front office extension split air conditioning unit. Consider extending the system to include the unconditioned office.
- Replace the workshop through the wall air conditioner unit or connect room to main office system.
- Replace Oil Test Lab range hood with a slotted bench type hood if work with chemicals and volatile substances are used here.
- Provide proper ventilation and make-up air systems to the majority of the building in accordance with ASHRAE 62.1. Consider using heat recovery technology.
- Replace the existing building automation system and expand the system throughout the building to existing and new HVAC equipment
- Provide backflow prevention on the firewater at the water entrance.
- A review of what is stored, how it is stored, and to what height it is stored in the warehouse area should be undertaken to ensure it complies with NFPA 13 for the overhead sprinkler protection that is present.

Electrical:

- Consider installation of the existing padmount transformer on new concrete pad with fire resisting barrier around transformer and change the transformer orientation if it is not equipped with internal current-limiting fuses and a pressure relief device.
- Some of the electrical equipment inside the main electrical room have exceeded its service life expectancy. Some panels and disconnects are obsolete and should be retrofitted or replaced.
- Power distribution equipment in the paint shop and salvage stores that service mechanical equipment that is no longer in use and should be removed with the obsolete equipment.
- Replace all old exterior lights under canopies and above exterior doors with new LED fixtures.
- Some old emergency lighting units and exit signs have to be replaced.
- All outdoor receptacles need to be replaced including the weather protective covers.
- Provide supports to the ceiling for unsupported cables and covers to open junction boxes.
- Install fire alarm system.
- Provide supports for unsupported data and communications cables in ceiling space.

Environmental:

- Paint existing transformer oil storage tanks.
- New and used transformer oil tank installation and exterior piping do not meet code. Tanks need to be relocated to minimum code distance from the building and each other and provided with non-combustible foundations. Piping should be properly supported and provided with flexible connections for movement.

Mid-term recommendations that should be planned to be done in the next 3-10 years are architectural, mechanical, and electrical and are summarized as follows.

Architectural:

- Replace metal siding.
- Replace approximately 9 exterior doors, frames and hardware.
- Upgrade office block washrooms finishes, vanities, cubicles partitions, accessories.

Mechanical:

- Replace the original building domestic water piping.
- Replace the server room split air conditioning unit.
- Replace the second floor split air conditioning unit.
- Remove and dispose of Paint Room ventilation equipment.

Electrical:

- Consider replacement of the outdoor loudspeakers.

Long-term recommendations that should be planned to be done past the next 10 years are architectural, civil, and electrical and are summarized as follows.

Architectural:

- Replace roof finishes.

Site/Civil:

- Replace concrete curbs.
- Replace storm water catch basins and CMP pipe.

Electrical:

- Replace electric heating equipment.

CHAPTER 2 FACILITY AUDITS

2.1 Main Office building

2.1.1 Architectural Assessment

This 3,100 square meter footprint two level office/warehouse building was constructed circa 1980. The building is a combination pre-engineered metal and conventional steel frame structure. The building houses a large office wing with staff lunch areas plus a warehouse which provides supply to Newfoundland and Labrador Hydro's operations throughout most of the Province. The rear of the warehouse is a former transformer shop where they are now stored and de-commissioned. Two mezzanines are located within the warehouse envelope with one housing offices, training and storage and the other a staff lunch room and clothing testing and cleaning. The building is clad in a combination of clay face brick at the office wing and vertical metal siding elsewhere. The office wing roofing is traditional built up pitch and gravel style. Warehouse roofing is standing seam metal. Windows are bronze colour finish aluminum and vinyl in an office extension off the warehouse and the warehouse itself. Exterior personnel doors are both aluminum and hollow metal in aluminum and pressed steel frames. Overhead doors are both original multi leaf vertical stack steel and new insulated pre-painted steel. The building envelope is showing its age and requires upgrading including replacement of windows and siding, repair of canopies etc. Interiors are in good condition but require code upgrades related to fire separations, ratings and exiting between offices and warehouse and within office and warehouse spaces. Current fire ratings are minimal.

2.1.1.1 Building Exterior Envelope

The office wing is clad with clay face brick with pre-painted metal facias. Brick is in good condition however metal siding has faded and corrosion is noted at several fasteners. The siding is reaching the end of its useful life and replacement should be considered in the next 3-5 years. The warehouse and office addition adjacent to it are clad in a combination of clay face brick and vertical pre-painted metal siding. There is some local corrosion at several siding fasteners and at the sill near warehouse overhead doors, replacement should be considered within the next 3-5 years. Brick is generally in good condition with some minor damage near the warehouse overhead doors and at the office addition. Windows are bronze finish aluminum in fixed and operable combination styles. Seven (7) windows in the office section appear to have a reflective film adhered to one lite of glass between the two hermetically sealed lites. The film has delaminated and is unsightly, such glazing units should be replaced. The frames are in good condition and do not require replacement. Other than some minor caulking windows are otherwise in good condition.

The thermal attributes of the office block exterior wall are unknown but one manager advised that the office and warehouse wings are drafty and cold in winter.

Main entrance doors are glazed aluminum in aluminum frames, glazing is single. These doors and frames are in good condition but thermally inefficient. Other personnel doors are hollow metal in pressed steel frames and are generally in good condition. Painting is suggested for all (approximately 9) as well as a check of hardware and weather stripping. Most overhead doors are multi leaf vertical sliding type, original to the building. Staff advised that a recent study took place and doors were given approval to continue operating. Painting is suggested since existing paint is faded and doors are stained with grease. New overhead doors are pre-painted sandwich insulated metal overhead type and are in good condition. Several personnel doors have had overhead snow and ice sliding canopies added. These require painting and structural enhancement. Several have decayed wood, requiring replacement.

The office block roofing consists of traditional built up tar and gravel. Those roofs appear in fair-good condition. Areas were observed where the gravel has washed away due to drainage from the upper warehouse roof. Other areas were also down to the tarred surface. Lichen was observed growing on parts of this roof. The warehouse and office extension roofs are of standing seam metal and are in good condition with no noticeable corrosion. Roofs do not have interior access ladders and hatches; access is provided via external fixed ladders.

2.1.1.2 Building Interior

Foundations consist of poured in place concrete with concrete slabs on grade. Flooring in office areas is finished with a combination of 300 x 300 mm vinyl tile and carpeting all of which are in good condition. Washrooms in the main office block floors are finished with ceramic tile which is dated but in good condition. Warehouse floors are concrete. The principal staff lunch room floor is finished with residential sheet vinyl. Walls and partitions in the office blocks are of metal stud and in the main block demountable vinyl coated drywall with battens, and in the warehouse office extension and mezzanines, of painted drywall. Ceilings are generally of 610 x 610 mm revel edge unrated suspended acoustical tile which is in good condition. Staining from leakage was observed in the central part of the office area directly below a roof relief vent. The roof insulation also appeared to be stained in this area. Washroom partitions are in poor condition as are vanities and should be replaced. Washroom accessories are in fair to good condition with selected replacements suggested. Doors are generally solid core wood in demountable metal frames and at some locations with fixed partitions in pressed steel frames. Offices in the main office block have frosted glass full height sidelights at each office. In addition to private offices the core of the main office block consists of demountable office cubicles.

Mezzanines are constructed from a combination of steel/concrete and wood floors. Walls and partitions are finished with painted drywall and doors are solid core wood in pressed steel frames. Masonry partitions separate the main office block from the warehouse, they extend to the underside of the roof insulation. Stairs are wood. No fire separations and fire labels were noted in the building. Mezzanine floor assemblies are required to be protected with a 45 minute rating. This may be achieved by either addition of a fire rated suspended acoustic tile ceiling or 16mm type-X drywall to the underside of these assemblies.

2.1.1.3 Building Code

The building is classified by the NBCC 2010 as a multi-classification building of D for office areas, F-2 for warehouses and for the transformer shop area.

2.1.1.4 Accessibility

The building is not accessible to persons with disabilities. Given its age it would not be required to be accessible unless renovations since 1981 and planned exceed 50% of the replacement cost of the building. Consideration might be given to modifying the building as far as practical to provide a degree of accessibility so mobility challenged persons can work there. Examples include the main entrance, and one washroom.

2.1.1.5 Selected NBCC 2010/LSC 101 Requirements

The following provides an overview of several National Building Code/Life Safety Code NFPA 101 requirements and applicable sections for this facility.

Requirements	**Compliance / Action**
1) <u>Building Occupancy</u> Group F-2 – Medium Hazard Industrial Group D – Business and Person Services – Office Areas *NBCC A-3.1.3.1*	Compliant
2) <u>Group F, Division 2, Up To Three Storeys</u> 1. A building classified as Group F, Division 2 is permitted to conform to Sentence (2), provided: a. It is not more than 3 storeys in building height, and b. It has a building area not more than 1500 m^2 when facing 3 streets. 2. The building referred to in Sentence (1) is permitted to be of combustible construction or non-combustible construction used singly or in combination, and a. Floor assemblies shall be fire separations with a fire resistance rating not less than 45 minutes, b. Mezzanines shall have, if of combustible construction, a fire resistance rating not less than 45 minutes, c. Roof assemblies shall have, if of combustible construction, a fire resistance rating not less than 45 minute, except that in a building not more than 1 storey in building height, the fire resistance rating is permitted to be waived provided that the roof assembly is constructed as a fire retardant treated wood roof system conforming to Article 3.1.14.1 d. Loadbearing walls, columns, arches supporting an assembly required to have a fire resistance rating shall i) Have a fire resistance rating not less than 45 minute, or ii) Be of non-combustible construction, and	Multiple occupancy building Group D – Offices Group F-2 – Medium Hazard Industrial Group F-2 – governs as the most restrictive Non-compliant Floor assembly and mezzanines including support structures shall have a 45 minute fire rating.

Requirements	Compliance / Action
e. Loadbearing walls, columns, arches supporting a fire separation shall have a fire resistance rating not less than that required for the separation. *NBCC 3.2.2.74*	
3) <u>Occupant Load (Based on LSC)</u> Group F2 -Medium Hazard Industrial: 518 m^2/46 m^2 per person = 113 Group D – Offices: 1,555 m^2/9.3 m^2 per person = 167 Total Occupant Load = 280 persons (Service rooms, storage, circulation and washrooms are excluded)	Compliant
4) Exit Capacity The maximum size of rooms or suites with one exit are as follows: Group D – 200 m^2 with a 25 metre travel distance to the egress door. Group F-2 – 150 m^2 with a 10 metre travel distance to the egress door. *NBCC 3.4.2.1.A*	Non-compliant-aisles in warehouse are dead ended. Mezzanine entrance distances are not met. Add exits from warehouse, and mezzanines.
5) Except if exits are located along the perimeter of the floor area and each main aisle in the floor area leads directly to an exit, the travel distance may be 60 metres maximum. NBCC 3.4.2.5	Non-compliant Add exits from warehouse
6) The minimum width of a public corridor shall be 1100 mm. *NBCC 3.3.1.9*	Compliant
7) Travel Distance shall be maximum of 30 metres. *NBCC 3.4.2.5*	Non-compliant Travel distances exceeded in offices, mezzanine, warehouse and exits not protected to exterior, add protected exits.
8) Exit capacity 280 persons x 6.1 mm per person = 1708 mm = 1.8 doors *NBCC 3.4.3.2*	Compliant
9) Exits shall be separated from the remainder of the building by a fire separation having a fire resistance rating of not less than 45 minutes. *NBCC 3.4.4.1*	Non-compliant Two exits and access to exits not currently fire rated or protected to the exterior.
10) Electrical rooms, if housing transformers, shall have a fire resistance rating of not less than 60 minutes. *NBCC 3.6.2.1*	Compliant
11) Washroom Fixture Calculation Group F2 - 113 persons: 4 male, 4 female Group D - 167 persons, 4 male, 4 female *NBCC 3.7.2.2*	Compliant 16 fixtures provided
12) The building need not be designed to meet the NL Accessibility Act requirements due to its age.	Compliant
13) In a building with more than one major occupancy, the requirement of the most stringent occupancy shall apply	F-2 governs

Requirements	Compliance / Action
to the entire building.	
14) Cooking equipment not within dwelling units used in processes producing grease laden vapours shall be designed and constructed in accordance with Part 6.	Non-compliant, however commercial hood with fire suppression system as required in Part 6 would not be required for this application. A standard residential hood is acceptable.
15) Fuel tanks are located outside the building close to it.	Refer to mechanical assessment.
16) Rooms for storage of janitorial supplies shall be construction with a 45 minute fire resistance rating. *NBCC 3.3.21.2*	Non-compliant Fire rated door and frame and rated walls and ceilings are required.
17) Limiting distance:	Complaint

2.1.1.6 Conclusions and Recommendations

The building while in good condition should be provided with the following life safety as well as envelope and interior improvements including the following:

- Provide fire rated floors for mezzanines.
- Provide new fire exits and upgrade existing deficient exits.
- Replace aluminum window glazing units which have delaminated film.
- Repair damaged door canopies.
- Paint exterior doors and frames.
- Repair minor brick damage.
- Replace metal siding.
- Replace approximately 9 exterior doors, frames and hardware.
- Upgrade office block washrooms finishes, vanities, cubicles partitions, accessories.
- Replace roof finishes.
- Consider `practical` accessibility provisions.

2.1.2 Civil/Site Assessment

2.1.2.1 Asphalt and Concrete Surfaces

Access roads and parking areas around the office/warehouse building are surfaced with asphalt with concrete curbs. The asphalt is in fair to good condition. Crack lines are present in various locations and a couple of areas were observed with deteriorating asphalt (see Site Civil photos 1 to 3). Only minor depressions were observed. Curbs are in poor to fair condition with cracking, snow clearing damage, and sections missing (see Site Civil photo 4).

Concrete walkways are provided around the office portion of the building, to parking lots, and at the rear of the building. The walkways are in fair to good condition with some cracked sections observed (see Site Civil photo 5). Concrete pads are provided at the main warehouse overhead doors and are in fair to good condition with some cracking present (see Site Civil photo 6). Concrete equipment pads and doorway entrance pads are present and are in good condition (see Site Civil photo 7).

2.1.2.2 Water and Sewer

Domestic and fire water for the facility is provided from a pressure boosting pump house. The pump house is located outside the area covered for this study and was therefore not observed as part of this project. Water enters the building at the north corner of the office area of the building through an underground main.

Sanitary sewer exits the building at two locations and is piped to two separate septic systems. One septic system utilizes a 22,000 L septic tank that is approximately five to ten years old. The second system goes to a 5,000 L septic tank however its age is unknown. It was indicated that both systems are serviced annually with no issues or concerns. A septic access pipe was observed for one of the systems near a fenced equipment storage area at the rear of the warehouse section of the building (see Site Civil photo 8).

2.1.2.3 Drainage

Storm runoff is handled by a storm drainage system on paved surfaces. Grassed and gravel surfaces are sloped for surface runoff. The paved surface drainage system is composed of a number of concrete catch basins with cast iron grates and interconnecting galvanized Corrugated Metal Pipe (CMP) (see Site Civil photos 9 and 10). Trench drains with grated covers are also provided in front of the warehouse overhead doors. Drainage is piped to the south of the compound site where it discharges into the nearby Exploits River.

Catch basis and grates were generally found to be in good condition. Many had significant amounts of silt, sand, and stone at their bottoms. One catch basin appeared to have no concrete bottom and is being undermined at its perimeter as observed inside the basin (see Site Civil photos 11 and 12). The CMP piping generally shows noticeable corrosion and is corroded through at some termination locations (see Site Civil photo 13).

Six catch basins appeared to have settled and are no longer level with the finished asphalt grade.

No drainage issues were observed on grassed and gravel areas within the area of the assessment project.

2.1.2.4 Conclusions and Recommendations

The following recommendations are made for the site civil:

- In the short term areas of decomposing asphalt should be cutout and patched or utilize grind and patch repairs.
- In the short term catch basins should have silt, stand, and stone removed from the chambers.
- In the short term catch basins that are below finished grade should be provided with grate risers to bring them up to grade level and new asphalt placed around them.
- In the long term the concrete curbs should be replaced.
- In the long term the storm water catch basins and CMP should be replaced due to the deteriorating condition of the pipe.

2.1.3 Structural Assessment

The main office building and warehouse consist of two pre-engineered metal buildings supported on a concrete foundation wall. Within the warehouse section of the building there are multiple mezzanine levels built. The main mezzanine of the warehouse section appears to be a steel framed structure with a concrete pan deck floor, while the additional mezzanines are timber framed structures. The ground floor of the office building and warehouse is a concrete slab on grade.

2.1.3.1 Foundation and Floor Systems

The building structure is supported on concrete foundation walls which are assumed to extend 1.22m to 1.52m (4' to 5') below grade for frost protection. The inspection of the foundation wall was limited as only the exterior portion of the wall extending above grade could be viewed.

A number of issues were noted during the inspection of the foundation walls. Large vertical cracks in the wall were noted at fairly consistent intervals (see Structural photo 1). It is not directly known what the cause of the cracking is however it is suspected that they are shrinkage cracks that formed during curing. It is most likely that the cracks widened over time due to water infiltration and repeated freeze thaw cycles.

In addition to the vertical cracks there are a number of areas of spalled or scaled concrete along the face of the warehouse foundation (see Structural photos 2 and 3). Scaled concrete is usually caused by water infiltration through cracks and repeated freeze thaw cycles causing pieces of concrete to detach from the main structure. Scaling can also be caused by defects in the concrete such as honey combing and segregation of the coarse aggregate during pouring. At one area of scaled concrete it was noted that ants were travelling through the foundation wall to the interior of the building (see Structural photo 4). Conversations with the employees at site revealed that water infiltration and pests have been an issue at this location of the foundation wall.

Although there are defects in the foundation wall that will require repairs, the remainder of the concrete appears to be sound. Overall the foundation wall appears to be in fair condition.

Concrete slabs on grade make up both the office and warehouse area's ground floor. The office area's floor slab was concealed by finishes and therefore could not be inspected. The warehouse concrete slab appears to be in good condition as there were only minor shrinkage cracks noted (see other report photos). The cracking that has been noted has most likely been present for quite some time and therefore has not affected the load capacity or performance of the slab. The cracking however should be monitored to ensure that the condition does not worsen.

2.1.3.2 Roof Systems

Both the office and warehouse sections roof system consists of exterior cladding and insulation supported by roof purlins which span to and are supported by the main building frames. The warehouse purlins were concealed leaving only the office building structure capable of being inspected.

The roof system of the office building appears to be in good condition. There were no noticeable signs of corrosion or deformations in the structural members. It was noted that reinforcing was carried out on the main building frame, and roof purlins added at the location where the warehouse and office portions meet (see Structural photos 5 & 6). Since the office building roof is at a lower

elevation than that of the warehouse the snow loading will be increased due to drifting. If the office building was constructed prior to the warehouse, or was not originally designed for the current loading situation then the reinforcing would be expected. However if the office building was designed to carry the current snow drift loading and still required additional reinforcing it suggests an analysis of the building should be carried out (if not already) to determine any possible overstresses.

A small timber framed structure supported on a concrete foundation wall was added to the side of the warehouse structure. This addition has a sloped roof constructed of pre-engineered timber trusses. The timber trusses were not visible as insulation and vapor barrier prevented the trusses from being visually inspected (see Structural photo 7).

2.1.3.3 Framing Systems

The building structure consists of rigid steel frames constructed of tapered columns and roof beams with additional support provided by intermediate interior columns (see Structural photo 8). The inspection of the rigid frames in the office building area was limited as drop down ceilings, duct work and piping prevented all aspects of the structure from being viewed. The wind girts, bracing and columns of the rigid frame could not be viewed as they were concealed by wall finishes within the office portion of the building.

Although the rigid frame members were visible in the warehouse section, the inspection was conducted from the ground therefore it too can be considered limited.

Overall the framing system of the building appears to be in fair condition. Within the warehouse section it was noted that seven (7) intermediate columns were deformed by what is suspected to be impact from mobile forklift equipment (see Structural photos 9, 10, 11). These deformations affect the overall capacity of the interior as they will be more susceptible to buckling if heavily loaded. A more concerning deformation was noted on the interior column at the 6th bay from the front of the warehouse and on the left hand side if looking at the back wall of the warehouse. The deformation noted is not a localized deformation due to the equipment impact, but more so a twisting of the column (see Structural photo 12 and 13). Although the direct cause of the twist in the column is not known it appears to be a result of overstressing. Damage such as this would merit an analysis to determine if overstresses are present within the structure.

Deformations were also noted in at least one of the wind girts which is adjacent to the new timber framed mezzanine (see Structural photo 14). It is not known whether this deformation is caused by wind loading or by impact from equipment. Other locations appear to have slight deformation however it was difficult to determine from the ground.

2.1.3.4 Mezzanines

There are currently three types of mezzanines located within the warehouse portion of the main building.

The first type of mezzanine consists of a concrete pan deck floor supported on W250 beams which span to and bear on concrete block walls. This framing extends from the upper level washrooms to the stairwell. Past the stairwell the mezzanine floor framing consists of C150 channels which are connected into the concrete block wall supporting the concrete pan deck floor. The inspection of the steel framing was limited as drop down ceiling tiles, electrical conduits/equipment and piping prevented the framing from being viewed. The visual inspection in the storage room on the main floor revealed that the majority of a C150 channel's top and bottom flange were removed to allow conduit to pass to the second floor level (see Structural photo 15). The removal of the flanges will result in a large reduction in capacity and given that the channel supports a concrete pan deck floor, an analysis should be done to determine the adequacy of the channel. The remainder of the steel framing that was visible appeared to be unaltered and in good condition.

The second type of mezzanine structure consists of what appears to be a reinforced concrete suspended slab supported on concrete block walls. It appears as though these mezzanine areas are part of the original building construction. Currently these areas are used as storage. The concrete suspended slab of the mezzanines appears to be in fair condition. For the most part the concrete appears to be sound, however there are locations where horizontal cracking on the face of the slab, and shrinkage cracks on the top of the slab are present (see Structural photos 16 and 17).

Timber framed floor systems have been added between the storage areas and adjacent to the electrical room. The mezzanine floor structure is a combination of TJI joist in one section and 38 x 235 (2"x10") joists in another. The floor system is supported by interior timber framed walls to avoid tying into the existing building frame structure. The inspection of the floor system and timber framed walls was limited as only certain locations could be accessed for viewing. The timber mezzanine appears to be new construction and appears to be built using proper construction practices. Overall the timber mezzanine is in good condition.

2.1.3.5 Concrete block wall.

The concrete block walls within the warehouse areas are load bearing as they support the mezzanine structures. The concrete block wall is supported on the interior concrete slab on grade. Although drawings showing the concrete foundations were not available it is assumed that the concrete slab is thickened at these locations.

There does not appear to be any cracking within the concrete block wall. Typically if any settlement has occurred due to loading the concrete block wall would crack along the grout line in a diagonal pattern. The concrete slab supporting the block wall does not appear to have any cracking present that would be a result of loading on the concrete block wall. Overall the concrete block wall is in good condition.

2.1.3.6 Miscellaneous structural components

Along the exterior of the warehouse structure the building envelope consists of a brick veneer. Brick veneer is either supported vertically by the concrete foundation wall or by a steel shelf angle placed at the bottom of the veneer and connected to the foundation wall. At the back of the warehouse near the large overhead doors the building envelope is combination of a brick veneer and metal

cladding (see Structural photo 18). It appears as though the brick veneer in this location is supported by a steel shelf angle. The angle supporting the brick veneer is in poor condition (see Structural photo 19) as it is heavily corroded and deformed.

A brick veneer also makes up the building envelope of the small addition on the side of the warehouse. The brick veneer is supported on the concrete foundation walls along the addition. There are steel angle lintels located above window and door openings of the structure (see Structural photo 20). These angles appeared to be in good condition.

2.1.3.7 Equipment platform

Along the back (north elevation) of the warehouse a small equipment platform was constructed to access the transformer oil storage tanks (see Structural photo 21). The equipment platform is in poor condition as it appears it was poorly constructed. The entire platform sways once loading is put onto it and timber posts near ladder locations are not bearing completely on ground (see Structural photo 22). In addition to the poor construction timbers are beginning to rot (see Structural photo 23).

2.1.3.8 Conclusions and Recommendations

Based on the observations made during the limited visual inspection, the following is recommended.

- Repairs need to be carried out on concrete foundation wall. Numerous vertical cracks should be filled, and areas where concrete has spalled should be repaired. Repair of the foundation may require excavation at the locations where damage is present in order to determine the direct cause of the damage.
- A structural analysis of the building frames should be conducted. Given the deformation of the column mentioned in section 2.1.3.3, there is a possibility that the building frames could be overstressed. If an analysis is not desired, the deformed/twisted column should be removed and replaced with a new column.
- Localized column repairs should be carried out. Within the warehouse area of the building there are 7 interior columns that are damaged due to equipment impact. These areas of damage should be repaired to avoid possible overstresses and buckling. It is expected that the columns can be repaired by adding plating over the damaged areas.
- The brick shelf angles along the northwest warehouse elevation should be repaired. Although the brick veneer is only small the shelf angles appear to be in poor condition.
- The small equipment pad accessing the tank at the rear of the building should be removed and replaced with a proper platform. The current platform is poorly constructed and is poor condition. A new platform with proper supports and framing should be installed.

2.1.4 Mechanical Assessment

2.1.4.1 Plumbing – Drainage, Waste, and Venting

The office/warehouse facility is equipped with a number of washrooms, coffee stations, and lunchrooms throughout the facility. The main floor of the office area is provided with two male washrooms, two female washrooms, and a large lunchroom. The second level office area is provided with a male and female washroom and a coffee station. The office extension on the front of the building is provided with a male and female washroom and a lunchroom. The transformer shop off the warehouse area is provided with a washroom on the ground level and a lunch room on the

mezzanine level. In addition to drainage, waste, and venting for these locations interior HVAC equipment is provided with drains and there are some floor drains.

Original waste and vent piping in the building is primarily cast iron and copper (see Mechanical photo 1). Piping used in renovations and extensions is primarily ABS (see Mechanical photo 2). ABS piping is generally permitted in a building such as this due to it being both combustible and non-combustible construction. ABS piping cannot be used in ceiling spaces used as return air plenums and where passing through fire separations must be provided with fire stop collars. No instances of these issues were observed however they potentially exist due to the presence of this type of pipe. In the lunch room off of the main office area the sink is provided with an air admittance valve rather than being vented to the outside. This valve is improperly installed on the upstream side of the sink trap and not on the downstream side of the sink trap (see Mechanical photo 3). This is a plumbing code violation. It was observed that vent piping for the plumbing fixtures at rear of the transformer shop terminates through the exterior wall of the building (see Mechanical photo 4). Venting for the second floor washrooms also terminates through the exterior wall rather than roof. Venting through the wall is a plumbing code violation.

Condensate drains from indoor HVAC units was observed to be copper.

A trench drain is present in the Truck Bay (see Mechanical photo 5). It was indicated that the trench drain does not drain properly and may be blocked.

2.1.4.2 Plumbing – Domestic Water Piping and Systems

Domestic water enters the building through the fire water main located in the building corner near the Truck Bay. Domestic water is tapped off of the main water entrance and flows through a pressure reducing valve then to the building (see Mechanical photo 6). It does not appear that the water is metered and no back flow prevention is provided.

Domestic water piping is copper throughout the facility. Domestic water piping is sporadically insulated in the original office area but typically uninsulated elsewhere (see Mechanical photo 7). Domestic water piping was observed not to be properly supported over the lunch room off of the main office area (see Mechanical photo 8).

Domestic water piping in the original portions of the building are 35 years of age and approaching the end of their expected life. Piping in parts of the building renovated in 1998 are 18 years old and are not at the end of their useful life.

Isolation valves are typically gate valves in older piping and ball valves in newer piping,

Domestic hot water is produced in electric hot water tanks scattered throughout the facility. Three tanks were found during the site visit but it is believed that there are likely one or two additional tanks present (see Mechanical photos 9, 10, and 11). Information on the observed tanks are as follows:

- Under cabinet type tank located in coffee station off of meeting room is a Giant model 112SEO-1R5M, 45 L, 1.5 kW, that was manufactured in 2014. This tank is in excellent condition.
- Tank located in a utility room one the mezzanine level at the rear of the transformer shop is a GSW model G650SDE-30 200, 182 L, 3 kW that was installed in 2015. This tank is in excellent condition.
- Tank located in female washroom of front office area is a Giant model 130E-3R7N, 100 L, 3 kW that was manufactured in 2002. This tank is at the end of its useful life.

Measured hot water temperatures ranged from 52.2°C to 53.2°C which is satisfactory.

A plastic water barrel was observed in the utility room on the mezzanine level of the transformer shop (see Mechanical photo 12). Site personnel indicated it is used to store water that is used in the glove testing machine located on the main level due to the low flow available in this part of the building.

Water quality in the building is not good as can be seen as discoloured water in fixtures. Inline cartridge filters were observed at some sink locations. Signs were also posted indicating not to drink the tap water.

2.1.4.3 PLUMBING – FIXTURES

As mentioned previously the facility has a number of washrooms, lunch rooms, and other areas with plumbing fixtures. Water closets are generally commercial grade floor mounted tank type utilizing 13 L per flush (see Mechanical photo 13). Water closets were in good conditions with no issues noted.

Urinals are wall hung vitreous china, some provided with electronic flush valves and other with manual flush valves (see Mechanical photo 14). The urinals were in good conditions with no issues noted.

Washroom lavatories were a combination of countertop drop in commercial grade vitreous china units, countertop drop in commercial grade stainless steel, and residential grade vanities (see Mechanical photos 15 to 17). Lavatory faucets were generally residential grade with commercial grade faucets provided with the stainless steel lavatories. Lavatories were in good condition with no issues noted.

Kitchen sinks are a combination of single bowl and double bowl stainless steel (see Mechanical photo 18). Sink faucets are residential grade either two handle or single lever type. Sinks were in good condition with no issues noted.

Two laundry tubs were present in the facility (see Mechanical photo 19). One is located in the second floor female washroom and the second in the Testing Room at the rear of the transformer shop. The tubs are residential grade plastic type with residential grade two handle faucets. Laundry tubs were in good condition with no issues noted.

Self contained wall mounted eyewash units are provided in the south corner of the warehouse and near the rear exit from the transformer shop (see Mechanical photo 20). The units are inspected and maintained on a regular basis.

2.1.4.4 HVAC – Air Handling Systems

The facility is equipped with a number of air handling systems including a rooftop packaged air conditioning unit, three split air conditioning units, a through the wall air conditioning unit, and various exhaust fans.

The main office area including the second floor is conditioned by a packaged constant volume rooftop air conditioning unit (see Mechanical photo 21). This unit is a Carrier model 50TJ020170QA and has a nominal 18 ton cooling capacity. The unit was manufactured in 1999 and was installed as part of the building upgrades made at that time. The unit is provided with a 5 HP indoor fan and a power exhaust option. The unit utilizes R22 refrigerant. At 17 years of age this unit is approaching the end of its useful life. No issues were observed or reported with the system.

This system is provided with ducted supply and return ducting throughout the office area (see Mechanical photos 7 and 22). Supply ducting is insulated with foil faced blanket type insulation. Zones are provided with inline electric duct heaters for reheat (see Mechanical photo 23). Air distribution is through square cone type diffusers and return air grilles. The air distribution system appeared to be in good condition. Return air grilles were observed to be very dirty (see Mechanical photo 24).

Based on the size and composition of the office area and the tabulated performance of this unit it may be undersized for the application.

Consideration could be given to utilizing a variable volume system when replacing the rooftop unit. In addition to the rooftop unit having variable speed fan control, new variable volume terminal units would be provided to reduce airflows and reduce system energy consumption.

The server room located in the main office area is provided with a split air conditioning system (see Mechanical photos 25 and 26). The condenser is located in the warehouse area truck bay and the evaporator is a ceiling cassette style unit located in the server room. The condenser is a United Technologies Carrier model 38HDC018341 and has a nominal cooling capacity of 1.5 tons. The unit was manufactured in 1999 and was installed as part of the building upgrades made at that time. The unit utilizes R22 refrigerant. At 17 years of age this unit is approaching the end of its useful life.

The front office extension is provided with a split air conditioning system (see Mechanical photos 27 and 28). The condenser is located outdoors adjacent to the large office area and the evaporator is an indoor air handler unit located in the ceiling of this large office. The condenser is a Carrier model 38TG030300 and has a nominal cooling capacity of 2.5 tons. The indoor unit is a Carrier model 40AQ030310BU. The units were manufactured in 1990 and utilize R22 refrigerant. This system is provided with supply ducting throughout this office area. Supply ducting is insulated with foil faced

blanket type insulation. Air distribution is through slot type diffusers and return air grilles. The air distribution system appeared to be in good condition. At 26 years of age this unit is at the end of its useful life. Personnel indicated that they had an issue with the location of the system thermostat, however they relocated it for better performance.

A portable air conditioning unit was observed in the far left office of the front office area extension (see Mechanical photo 29). This office is not served by the air conditioning system described above. The unit is the portable type with condenser venting through an operable window. The unit appears to be relatively new and operating properly.

The second floor office and lunch room at the rear of the transformer shop is provided with a split air conditioning system (see Mechanical photo 30). The condenser is located outdoors on the roof above the evaporator and the evaporator is an indoor air handler unit located in the ceiling of the second floor corridor area. The evaporator is an Inter-City Products Corp model BMM024BKB. This company is no longer in operation. Based on its model number it has a nominal cooling capacity of 2 tons. The units were manufactured in 1996 and likely utilizes R22 refrigerant. This system is provided with ducted supply and return ducting throughout the office and lunch area. Supply ducting is insulated with foil faced blanket type insulation. Air distribution is through square cone type diffusers and return air grilles. The air distribution system appeared to be in good condition. No operational issues were observed during the site visit. At 20 years of age this unit is at the end of its useful life.

The Workshop located off of the main office area is equipped with a through the wall air conditioning unit manufactured by Electrohome. The unit operated however its cooling circuit does not appear to be operating properly. This unit should be replaced (see Mechanical photo 31).

The main office area washrooms are exhausted through a spun aluminum roof fan (see Mechanical photo 32). The fan is a Penn Domex downblast type that is dated 1999. The fan is in good condition with no observed issues.

Located in the north corner of the facility is a paint room. The paint room is equipped with two wall mounted propeller exhaust fans and a make-up air unit (see Mechanical photos 33 and 34). The make-up air unit is a Trane Torrivent model 25-VF and is belt driven with a 7.5 HP motor. The unit is a large cabinet type centrifugal blower. This unit is located outdoors on a stand adjacent to the Paint Room. The unit is in poor condition with appreciable corrosion on its top panels and its casing deformed out of shape. The wall exhaust fans are direct drive and heavily coated in dust from the painting operations that went on in the space. The exhaust fan motors and their wiring do not appear to be explosion proof as is the other components in the room such as the unit heater and lighting. The age of this equipment is unknown but would be estimated to be 30 plus years of age. Personnel indicated that the space is no longer used for painting operations. As such the ventilation equipment here could be removed.

The transformer repair shop is provided with a fume extraction system which composed of a long reach flexible high pressure exhaust hose with travel arm, swivel joint, fume extraction cone, and high pressure centrifugal exhaust fan (see Mechanical photo 35). The fan discharges air to the outside along the north wall of the facility. The system was manufactured by Nederman. Its age is unknown, however the unit is in good condition and worked properly when operated during the site visit.

Washrooms adjacent to the training room, washrooms above the training room area, the male washroom at the front office extension, and the washroom at the rear of the transformer shop are provided with ceiling exhaust fans. These fans are typically ducted to the nearest exterior wall and terminated with a wall cap. See Mechanical photos 36 and 37.

The lunch room at the front office extension is provided with a ceiling mounted exhaust fan ducted to a roof vent (see Mechanical photo 38). This fan is a propeller type with steel grille. The fan operates but is noisy so its use is likely limited.

The Paint Storage room is provided with an inline exhaust fan. The fan is ducted to an exhaust grille near the floor and exhaust is ducted to a wall cap on the exterior wall (see Mechanical photo 39). The observer was unable to get this fan to function during the site visit.

The Test Room is provided with a washroom type ceiling exhaust fan that is ducted to the outside through a wall cap on the exterior wall. This fan operated properly.

The Oil Test Lab is fitted with a residential style range hood over the workbench (see Mechanical photo 40). The hood is manufactured by Mercury Nutone and appears to be quite old. The hood is ducted to the outside through a wall cap on the exterior wall. This fan operated properly. Flow from this hood would be expected to be low and capture velocity at bench height negligible. Based on American Conference of Governmental Industrial Hygienists (ACGIH) standards hoods should provide a capture velocity at the working level of 0.25-0.5 m/s (50-100 FPM) for this type of work. This can be accomplished by keeping the air intake close to the working surface with a mobile fume extractor, utilize large flowrates for a fixed overhead hood, provide a slotted bench type hood, or utilizing a fume type hood which has an adjustable opening. The most practical from a flow and cost perspective is a slotted bench type hood which draws air across the bench horizontally to the back where a slotted hood is located.

2.1.4.5 HVAC – Ventilation Air

The rooftop air conditioning system that serves the main office area is capable of providing sufficient ventilation air to this part of the building. The remainder of the building has no means of proving ventilation air in accordance with ASHRAE 62.1. The other air conditioning systems described above only recirculate air within their areas. There is no source of makeup air for the other various exhaust systems other than what would come in around doors, windows or other poorly sealed parts of the building.

For efficiency purposes it would be recommended to provide heat recovery on any new systems to bring in ventilation air. Due to the size and distribution of areas in the building providing a number of smaller heat recovery units over one large unit would be more feasible as smaller ductwork could be used and there would be no structural issues associated with a large rooftop unit. Individual units would take exhaust from local washrooms, janitor rooms, lunchrooms, etc that would replace the function of existing exhaust fans. Supply air would be provided to offices, corridors, lunchrooms, warehouse space, and transformer shop area.

2.1.4.6 HVAC – CONTROLS

The building has a combination of stand alone controls and a Building Automation System (BAS). The BAS services the main office area of the building and second floor area and was installed during the renovation project of 1999. The BAS controls operation of the rooftop unit, zone duct heaters, baseboard heaters, and rooftop washroom exhaust fan. The BAS is composed of control panels, zone thermostats, sensors, and other end devices (see Mechanical photos 41 and 42). The main BAS panel is located in the office area server room.

The BAS system is Delta Controls and is not BACNet compatible. The system is now 18 years of age and finding replacement controllers may be difficult should one fail. The observer was not able to access the graphic interface while on site to assess the system.

The split air conditions systems serving the server room, front office extension, and transformer shop second floor offices are all controlled by individual digital thermostats installed in the areas (see Mechanical photo 43). These thermostats are not connected to the BAS.

Washroom and other miscellaneous fans are controlled by simple toggle switches.

An electromechanical timeclock was observed at the Paint Storage room but it was not clear if it controlled the exhaust fan for this room.

2.1.4.7 FIRE PROTECTION

The building is fully protected by a combination wet and dry sprinkler system. The main water entrance is located in the building corner near the Truck Bay. Located at the water entrance is a wet system alarm valve (see Mechanical photo 44). No backflow prevention is present at the water entrance though by current practice it should as the system does have a glycol loop present. The fire department connection and bell are located on the adjacent exterior wall. A dry system valve and trim is located on the second floor in a closet space off of the coffee room (see Mechanical photo 46).

Sprinkler piping is primarily black iron with screwed fittings. Newer modifications to the system use grooved fittings. Sprinkler heads are a combination of upright and pendant style. Areas with concealed combustible construction appeared to be properly protected. No unprotected spaces were observed.

There were no rack storage sprinklers present. It was observed that storage was piled very high to the roof which can interfere with sprinkler effectiveness (see Mechanical photo 47). A review of what is stored, how it is stored, and to what height it is stored should be undertaken by a fire protection specialist to ensure it complies with NFPA 13 for the overhead sprinkler protection that is present. Specifically warehouse storage should be assessed from what classes of goods are present, if they are encapsulated or open, use of pallets and other rack obstructions, evaluation of maximum allowable storage height, and evaluation of isle widths. The review should provide conditions for what can be stored, how it should be stored, and how high storage can be utilizing the existing overhead sprinkler protection. If the existing overhead protection does not serve the required storage needs then recommendations should be provided for rack sprinklers including their configuration and estimated cost to install.

The sprinkler system did not appear to have any visible issues such as leaks, improper support, or other installation issues.

The building is provided with portable fire extinguishers throughout. The majority of the extinguishers are dry chemical type suitable for class A, b, and C fires. There appeared to be sufficient fire extinguishers for the hazard classification of the building.

2.1.4.8 Conclusions and Recommendations

The following recommendations are made for mechanical improvements to the depot building.

Plumbing:

- Modify Lunch Room sink vent piping to be code compliant.
- Modify plumbing vent piping that penetrates exterior walls to penetrate roof.
- Have Truck Bay trench drain cleaned and snaked to make functional again.
- Provide backflow prevention on domestic water takeoff.
- Properly insulate domestic water piping.
- Provide proper supports for domestic water piping.
- In the mid-term replace the original building domestic water piping.
- Replace any hot water tanks older than 10 years of age.
- Provide backflow preventer on water barrel fill pipe.

HVAC:

- Replace the office area rooftop air conditioning unit. Verify capacity requirements prior to replacement.
- As an option utilize variable volume in the new rooftop unit and install variable volume air terminal zone units with digital controls.
- In the mid-term replace the server room split air conditioning unit.
- Replace the front office extension split air conditioning unit. Consider extending the system to include the unconditioned office.
- In the mid-term replace the second floor split air conditioning unit.
- Replace the workshop through the wall air conditioner unit or connect room to main office system.
- Remove and dispose of Paint Room ventilation equipment.

- Replace Oil Test Lab range hood with a slotted bench type hood if work with chemicals and volatile substances are used here.
- Provide proper ventilation and make-up air systems to the majority of the building in accordance with ASHRAE 62.1. Consider using heat recovery technology.
- Replace the existing building automation system and expand the system throughout the building to both existing and new HVAC equipment.

Fire Protection:

- Provide backflow prevention on the firewater at the water entrance. Due to limited space a vertical backflow prevention device may be required.
- A review of what is stored, how it is stored, and to what height it is stored in the warehouse area should be undertaken to ensure it complies with NFPA 13 for the overhead sprinkler protection that is present.

2.1.5 Electrical Assessment

2.1.5.1 Service and Distribution

2.1.5.1.1 Description

The electrical service enters the building underground from a padmount transformer located outside the main electrical room (refer to Electrical photo 1).

The main incoming service conductors to the building are connected to a 600A, 600V main disconnect switch.

Revenue metering is performed on the low voltage secondary side of the padmount transformer. The meter (NL Power Meter # 690653) is attached to the padmount transformer enclosure (refer to Electrical photo 2).

The main disconnect feeds through a 600A, 600V, 3P splitter the following:

.1 600V, 400A, 3PH, 3W switchboard providing power to warehouse heat, air conditioning, overhead doors and mechanical equipment.
.2 600-120/208V, 225 kVA, 3PH distribution transformer with 600A, 120/208V, 3PH, 4W switchboard providing power to office area and warehouse lighting, office area heating and various building loads.
.3 600V to splitter located in salvage stores area for local distribution.

Power distribution in the paint shop and salvage stores area is provided through 600V splitter for 600V loads and 600-120/208V, 75 kVA distribution transformer for 120/208V loads (refer to Electrical photo 3).

Power distribution in the rubber glove/hot stick test room is provided through 600V, 3PH switchboard (year 1985) fed from main 600V switchboard and 600-120/2240V, 1PH, 3W, 50 kVA distribution transformer.

120/208V electricity is distributed through the facility is distributed through ten (10) distribution panelboards (refer to Electrical photo 4).

The power distribution system is grounded at the building main disconnect.

2.1.5.1.2 OBSERVATIONS

The incoming 600A service capacity appears to be adequate based on the peak demand history over the past 3 years. The maximum demand is 317.9 kW (340A @ 0.9 PF).

The padmount transformer is in relatively good physical condition with no visible signs of corrosion. The transformer is installed on 8" x 8" wood beams laying on a concrete pad (refer to Electrical photo 1).

Most of the power distribution equipment in main electrical room appears to be more than 30 years old and is in fair physical condition. There were no visible signs of excessive wear or corrosion. There are two (2) new 600V, 60A disconnects servicing AC Unit #1 and Humidifier. Cabling/conduit runs also appeared to be in good condition with no apparent deficiencies.

Panelboards are surface mounted in the warehouse area and recessed mounted in corridor space and feed mostly lighting and receptacle loads. Panels in the office area are installed not more than 10 years ago and are in good condition. There is not sufficient spare capacity on some of the panelboards.

2.1.5.1.3 CONCLUSIONS

Consider installing the existing padmount transformer on a new concrete pad. Install fire resisting barrier around transformer and change the transformer orientation if it is not equipped with internal current-limiting fuses and a pressure relief device.

Based on the visual inspection of the facility, some of the electrical equipment inside the main electrical room have exceeded its service life expectancy. Panels #1(120/208V), #6 (600V), and the 600A main disconnect are obsolete and should be retrofitted or replaced.

Overall condition of the electrical distribution systems in the office area and the warehouse area appears to be good condition.

Power distribution equipment in the paint shop and salvage stores that service mechanical equipment that is no longer in use and should be removed with the obsolete equipment.

2.1.5.2 EMERGENCY POWER SYSTEM

There is no emergency power distribution system.

2.1.5.3 Lighting

2.1.5.3.1 Description

The majority of the office areas is illuminated by 4 ft. recessed acrylic lens florescent fixture with a T8 Lamps. (Refer to Electrical photo 5)

Some service and storage rooms are lit with 4 ft. surface mounted 2–lamp, T8 linear wraparound or strip fluorescent fixtures. (Refer to Electrical photo 6)

The meeting room and the training room are lit with fluorescent fixtures with parabolic louvers and incandescent downlights. (Refer to Electrical photo 7)

The warehouse area is primarily illuminated by relatively new 250W Holophane metal halide high bay lighting fixtures. (Refer to Electrical photo 8)

The exterior building lighting is provided by HID lights installed on 6 m lighting poles around the building perimeter, incandescent lighting fixtures under entrance canopies and LED wallpacks. (Refer to Electrical photos 9, 10 and 11)

The building lighting is fed from the 120/208V panelboards.

2.1.5.3.2 Observations

Office areas, corridors, warehouse, paint shop and salvage stores were observed to have adequate lighting levels as required by the latest edition of the NBCC.

The lighting fixture in the office area, salvage stores area and warehouse are less than 10 years old and in good condition.

The lighting fixtures in the paint shop are older and in fair condition.

2.1.5.3.3 Conclusions

Replace all old exterior lights under canopies and above exterior doors with new LED fixtures.

2.1.5.4 Exit and Emergency Lighting

2.1.5.4.1 Description

The building emergency lighting consists of dual head emergency battery units. In some locations the battery unit is combined with exit sign. Most of the battery units are new and in good condition.

The building is equipped with lighted exit signs located throughout. They have battery backup and are lit with incandescent lamps.

(Refer to Electrical photo 14 for emergency and exit lighting)

2.1.5.4.2 OBSERVATIONS

Emergency lighting units and exit signs are adequate and most of them are in good condition.

2.1.5.4.3 CONCLUSIONS

Some old emergency lighting units and exit signs have to be replaced. Two old emergency lighting units located in the attached offices corridor and in the paint shop and salvage stores area and one exit sign in the paint shop and salvage stores area have to be replaced.

2.1.5.5 HEATING SYSTEM

2.1.5.5.1 DESCRIPTION

The whole building is heated by electrical heaters. The heaters in the office area are new baseboard heaters and old wall mount convection heaters (refer to Electrical photos 21 and 22). The warehouse, the salvage stores area and the service rooms are heated by electric unit heaters. (Refer to Electrical photo 23)

Most of the heaters are controlled by wall mount thermostats. (Refer to Electrical photo 24) In some areas the heaters are equipped with integral thermostats.

2.1.5.5.2 OBSERVATIONS

The electric office area baseboard heaters are less than 10 years old and in good condition. The rest of the heaters are more than 20 years old but operational and in relatively good condition.

2.1.5.5.3 CONCLUSIONS

No heater replacement will be required in the next ten (10) years.

2.1.5.6 WIRING DEVICES

2.1.5.6.1 DESCRIPTION

U-grounded, duplex receptacles are installed throughout the building. Receptacles are recessed with the exception of the receptacles installed in the warehouse and other mechanical spaces, which are surface mounted. The receptacles in wet areas are GFCI. The outdoor receptacles are weather protected type duplex receptacles.

The lighting control in offices, warehouse and paint shop and salvage stores area is provided by individual lighting switches for each circuit. (Refer to Electrical photos 12 and 13)

2.1.5.6.2 OBSERVATIONS

Receptacles and lighting switches in the office area appear to have been replaced recently and are sufficient quantity and in good condition. All outdoor receptacles are in bed condition (Refer to Electrical photo 15).

2.1.5.6.3 CONCLUSIONS

Three outdoor duplex receptacles need to be replaced including the weather protective covers.

2.1.5.7 Wiring Methods

2.1.5.7.1 Description

Wiring system appears to be a combination of AC-90 and TW or RW90 cabling installed in EMT conduit in office area. EMT and conduit is generally used for wiring in unfinished service rooms, warehouse, paint shop and salvage stores area.

2.1.5.7.2 Observations

Most of the wiring appears to have been replaced recently and is in good condition. Some of the cables were not properly supported in ceiling spaces and were lying on the ceiling tiles or on the HVAC ducts. It was noted junction box with missing cover in main electrical room (refer to Electrical photo 16).

2.1.5.7.3 Conclusions

The branch circuit wiring was in overall good condition but we recommend providing supports to the ceiling for unsupported cables and covers to open junction boxes.

2.1.5.8 Fire Alarm

2.1.5.8.1 Description

Not available.

2.1.5.8.2 Observations

There is no fire alarm system in the building.

2.1.5.8.3 Conclusions

As the building is sprinklered a fire alarm system is required.

2.1.5.9 Data and Communications

2.1.5.9.1 Description

The building telecommunication cables enters the building in the telecom room located adjacent to the building entrance. All telecom equipment including but not limited to telephone BIX blocks, telecom racks, patch panels, Ethernet switches, etc. and cabling is not more than 10 years old and is in good condition. Most of the telecommunication cables in cable space are run in basket type cable tray (refer to Electrical photo 17).

2.1.5.9.2 Observations

Some of the telecommunication cables not lying in cable tray were not properly supported in ceiling spaces and were lying on the ceiling tiles or on the HVAC ducts (refer to Electrical photo 18).

2.1.5.9.3 Conclusions

Supports to the ceiling for unsupported cables needs to be provided.

2.1.5.10 CCTV / Security System

2.1.5.10.1 Description

There is a proximity card access control system that controls access to some building areas during after hours. The card access system is relatively new and in good condition (refer to Electrical photo 19). There is no CCTV system.

2.1.5.11 PA System

2.1.5.11.1 Description

There is a public address (PA) system in the building controlled from the front desk. The loudspeakers are recessed in the ceiling tiles inside the office area and surface mounted in the warehouse area and the storage area adjacent to the building.

2.1.5.11.2 Observations

The loudspeakers inside the office area are new and in good condition. The loudspeakers in the warehouse and outdoor are old but still operational. (Refer to Electrical photo 20)

2.1.5.11.3 Conclusions

Consider replacement of the outdoor loudspeakers in the next five (5) years.

2.1.6 Environmental Review

2.1.6.1 Air Emissions

No air emissions are present from the facility from fuel burning equipment or processes using chemicals.

2.1.6.2 Asbestos Containing Materials

An asbestos survey provided to the consultant indicated the presence of asbestos in floor tile and in eave soffit paneling around the main office area. The presence of these asbestos containing materials shall be made aware to any personnel undertaking work in the facility that could disturb these materials.

2.1.6.3 Lead Containing Materials

Lead is likely present in plumbing solder and possibly in oil based paints used in the facility. The potential presence of lead containing materials shall be made aware to any personnel undertaking work in the facility that could disturb these materials.

2.1.6.4 PCB Containing Materials

Fluorescent lighting in the facility is not old enough to be of concern for presence of PCB's that were commonly used in older lighting ballasts.

2.1.6.5 Ozone Depleting Substances

All air conditioning systems (with exception of the portable AC unit) present in the facility utilize of ozone depleting refrigerants such as R22. Older refrigerators may also contain ozone depleting refrigerants. Ozone depleting refrigerants must be recovered and properly documented prior to equipment being disposed of.

There was no Halon fire extinguishing systems identified in the facility.

2.1.6.6 Indoor Air Quality

While no indoor air quality issues were noticed while on site, a substantial portion of the facility is not provided with proper ventilation and make-up air systems. Any odours, VOC's from off gassing, and other airborne pollutants cannot be effectively removed from the building.

2.1.6.7 Mould and Mildew

No signs of mould or mildew were present throughout the building.

2.1.6.8 Spills and Contaminated Areas

No signs of spills or contaminated soils were overserved in the facility or its surrounding property.

2.1.6.9 Flammable and Combustible Liquids Storage

Flammable and combustible liquids were found to be present in the Warehouse, Transformer Shop, Paint Room, and Paint Storage areas of the building (see Environmental Photos 1 to 12).

Liquids found in safety cabinets in the Warehouse included:

- Motor oil;
- Automatic transmission oil;
- Aerosol spray lubricants;
- Barb-B-Que lighter fluid.

Liquids found in the Transformer Shop included:

- 205 L drums of transformer oil;
- 20 L pails of transformer oil;
- Miscellaneous shop items.

Liquids found in the Paint Room included:

- 205 L drums of transformer oil;

Liquids found in safety cabinets and out on room benches and floor in the Paint Storage room included the following. It was observed that many items in the Paint Storage room were not placed in the safety cabinets.

- Alkyd paints;
- Epoxy paints:
- Aerosol spray paints;
- Solvents;
- Paint thinners;
- Used paint thinners;
- Transformer oil;
- Gasoline containers;
- Fuel conditioner;
- Motor oil;
- Automatic transmission fluid.

Quantities present do not exceed maximum amounts allowable for incidental use.

Bulk quantities of new and used transformer oil were observed outdoors in above ground storage tanks at the north end of the building (see Environmental Photos 13 and 14). New transformer oil is held in an above ground self dyked steel tank of 4,540 L capacity and was manufactured in 1996. The tank conforms to ULC S653 for storage of flammable and combustible liquids. The tank is in generally good condition but should be repainted. Used transformer oil is held in an above ground self dyked steel tank of 18,000 L capacity and was manufactured in 1996. The tank conforms to ULC S653 for storage of flammable and combustible liquids. The tank is in generally good condition but should be repainted. Both tanks should be provided with electronic overfill devices with audible and visual alarms as these tanks can be filled remotely without being directly observed. Based on CSA code tanks of this capacity should be located a minimum of 1.5 m from a building. In this case both tanks were observed to be much closer than this minimum distance. Also tanks should be spaced a minimum of 1 m from other tanks which in this case was not met. Tank foundations are to be non-combustible and not contain combustible preservative material. These tanks are mounted on creosote treated wood.

Supply and fill piping from the 4,540 L new oil tank enters the building through the exterior wall. The piping is improperly supported in various locations (see Environmental Photos 15 to 17). Fill piping for the 18,000 L used oil tank enters the building through the exterior wall. The piping is improperly supported in various locations (see Environmental Photos 17 and 18). No flexible joints are provided in piping to allow for frost heave of the tanks with respect to the building.

Inside the building supply and fill pipes from the 4,540 L tank penetrate the exterior wall and terminate over a drip pan where connections can be made to draw off new oil or fill the tank (see Environmental Photo 19). A fill pipe to the 18,000 L tank also penetrates the exterior wall. This pipe is connected to an electrically driven pump and the suction side is set up with quick fittings to allow tanks or transformers to be drained (see Environmental Photo 20). The transfer pump is a positive displacement type 1 HP Viking model GG4195. The pump and associated pipe and fittings appear to be very new condition. The pump assembly and suction piping is mounted above a drip pan.

2.1.6.10 Compressed Gases Storage

No compressed gases were observed in the project limits.

2.1.6.11 Conclusions and Recommendations

The following recommendations are made regarding environmental issues identified.

- Indoor air quality should be addressed as per the recommendation in the mechanical section of this report.
- The presence of asbestos and potentially lead containing materials are to be made aware to anyone undertaking work that may disturb these materials.
- Ozone depleting substances (refrigerants) should be properly recovered prior to disposing of equipment.
- Paint existing transformer oil storage tanks.
- New and used transformer oil tank installation and exterior piping do not meet code. Tanks need to be relocated to minimum code distance from the building and each other and provided with non-combustible foundations. Piping should be properly supported and provided with flexible connections for movement.

2.1.7 Energy Usage Review

Knowing the energy consumption of a facility from all sources (electricity, petroleum fuels, etc.) an energy use intensity (EUI) can be calculated which can be compared to benchmark EUI's for various types of buildings in Canada. These benchmarks represent median EUIs for various types of facilities. Energy usage information was provided for the years 2014 to 2015 for this site. Based on the building area and the energy consumption the EUI was calculated for each of these years to be 0.65 and 0.61 respectively.

Based on the EUI tables for various building uses, the median Site EUI for a mixed use building is 0.90. Based on this the building is more energy efficient than the national median value. However as the building is not provided with a proper ventilation system its calculated EUI is less than would be expected. It would be expected that with the addition of a proper ventilation systems this building EUI would increase to around the national median value.

CHAPTER 3 REHABILITATION EXPANSION UPGRADE ASSESSMENT

3.1 Bishops Falls Office/Warehouse

Based on current usage, and beyond repairs and code upgrades identified in Chapter 2 of this report, no major rehabilitation, expansion, or upgrades are recommended for this facility.

CHAPTER 4 COST ESTIMATES

4.1 Recommended Renovations and Improvements to Existing Facilities

4.1.1 Purpose

This section provides an overview of the costs associated to complete the recommended repairs and upgrades outlined above for each building to maintain current operations and functionality and comply with current codes. New construction and extension cost estimates include incorporation of expansion, and upgrading of facilities to service future operational requirements.

Renovation, maintenance and repair costs are grouped into three categories: Immediate; Mid-Term; and Long-Term. The work considered for immediate repairs would include all things which pose a threat to life safety and would also include correcting deficiencies with structural, civil, environmental, mechanical, and electrical. For the regularly occupied buildings, and buildings intended for long-term use, these renovations would be very important to complete for the safety, well-being, and comfort of occupants. For buildings determined to be unsuitable for long-term future use, only repairs which are deemed absolutely necessary would be considered.

Mid-term repairs would be intended for completion in the 3 to 10 year range, assuming the repairs listed as immediate are completed. This could include such items as architectural finishes replacement, end of serviceable life equipment replacement or upgrading of equipment to better service the facility. The long-term repair category would also only apply to buildings intended for extended use as these repairs would fall in the range of 10 to 20 years. These long-term repairs also require the immediate and mid-term repairs to be completed as intended.

4.1.2 Cost Estimating Accuracy

The estimates contained in this report are intended to provide order of magnitude construction costs only and are accurate to Class 3 (-10 to +30%) standards as per generally recognized industry practices. Estimates are based on the site observations (repairs & upgrades) and with the owner's future use and operations considered (new construction/extension). The estimates include appropriate contractor overhead, design contingency and location factors. All estimates are intended to provide an order of magnitude indication of the final project cost and are considered to be sufficient for the purpose of analyzing the redevelopment options under consideration. The figures listed below are an indication of the probable construction cost at the time of this report and are intended to represent fair market value of the scope of work assuming that such work is grouped into reasonably sized contract packages. Unless noted otherwise, architectural and

engineering design fees are not included, nor are value-added taxes. All costs are expressed in Canadian dollars.

4.1.3 Bishops Falls Office/Warehouse

4.1.3.1 Immediate Maintenance and Repairs

The following renovations, repairs, and/or upgrades are recommended to be completed within the next two years, assuming the facility is intended to continue operations.

Architectural:

- Provide fire rated floors for mezzanines - $16,000
- Provide new fire exits and upgrade existing deficient exits - $60,000
- Replace aluminum window glazing units which have delaminated film - $4,800
- Repair damaged door canopies - $3,500
- Paint exterior doors and frames - $2,700
- Repair minor brick damage - $2,200
- Consider `practical` accessibility provisions - $8,000

Structural:

- Repairs need to be carried out on concrete foundation wall at vertical cracks (8 locations) - $6,500.
- A structural analysis of the building frames should be conducted. Given the deformation of a column located in the warehouse area, there is a possibility that the building frames could be overstressed - $8,500.
- If an analysis is not desired, the deformed/twisted column should be removed and replaced with a new column - $16,000 (column replacement only).
- Localized column repairs should be carried out. Within the warehouse area of the building there are numerous locations where columns are damage due to equipment impact. It is expected that the columns can be repaired by adding plating over the damaged areas. (7 locations) - $7,500
- The brick shelf angles on the back wall should be repaired. Although the brick veneer is only small the shelf angles are in poor condition - $5,000
- The small equipment pad accessing the storage tanks at the rear of the building should be removed and replaced with a proper platform - $3,500

Site/Civil:

- Areas of decomposing asphalt should be cutout and patched or utilize grind and patch repairs - $7,000
- Catch basins should have silt, stand, and stone removed from the chambers - $5,000
- Catch basins that are below finished grade should be provided with grate risers to bring them up to grade level and new asphalt placed around them - $10,500.

Mechanical:

- Modify Lunch Room sink vent piping to be code compliant - $200
- Modify plumbing vent piping that penetrates exterior walls to penetrate roof - $1,500
- Provide backflow prevention on domestic water takeoff - $3,000
- Have Truck Bay trench drain cleaned and snaked to make functional again - $800

- Properly insulate domestic water piping - $2,500
- Provide proper supports for domestic water piping - $1,000
- Replace any hot water tanks older than 10 years of age - $2,400
- Provide backflow preventer on water barrel fill pipe - $2,500
- Replace the office area rooftop air conditioning unit - $35,000
- As an option utilize variable volume in the new rooftop unit and install variable volume air terminal zone units with digital controls - $24,000
- Replace the front office extension split air conditioning unit. Consider extending the system to include the unconditioned office - $7,500
- Replace the workshop through the wall air conditioner unit or connect room to main office system - $1,000
- Replace Oil Test Lab range hood with a slotted bench type hood if work with chemicals and volatile substances are used here - $7,500
- Provide proper ventilation and make-up air systems to the majority of the building in accordance with ASHRAE 62.1. Consider using heat recovery technology - $78,000
- Replace the existing building automation system and expand the system throughout the building to existing and new HVAC equipment - $109,000
- Provide backflow prevention on the firewater at the water entrance - $18,000
- A review of what is stored, how it is stored, and to what height it is stored in the warehouse area should be undertaken to ensure it complies with NFPA 13 for the overhead sprinkler protection that is present - $6,500

Electrical:

- Consider installation of the existing padmount transformer on new concrete pad with fire resisting barrier around transformer and change the transformer orientation if it is not equipped with internal current-limiting fuses and a pressure relief device - $14,000
- Some of the electrical equipment inside the main electrical room has exceeded its service life expectancy and should be replaced – $20,200
- Power distribution equipment in the paint shop and salvage stores that service mechanical equipment that is no longer in use and should be removed with the obsolete equipment - $1,500
- Replace all old exterior lights under canopies and above exterior doors with new LED fixtures - $4,500
- Some old emergency lighting units and exit signs have to be replaced - $4,000
- All outdoor receptacles need to be replaced including the weather protective covers $1,200
- Provide supports to the ceiling for unsupported cables and covers to open junction boxes.
- Install fire alarm system - $29,000
- Provide supports for unsupported data and communications cables in ceiling space - $2,000

Environmental:

- Paint existing transformer oil storage tanks - $2,500
- New and used transformer oil tank installation and exterior piping do not meet code. Tanks need to be relocated to minimum code distance from the building and each other and provided with non-combustible foundations. Piping should be properly supported and provided with flexible connections for movement - $18,500

Estimated total cost for immediate repairs and upgrades:
$564,500 sub-total cost x 10% contingency = $621,000 total cost

4.1.3.2 Mid-Term Maintenance and Repairs

The following list contains recommended renovations and repairs for completion in the next 3 to 10 years, again assuming the building will remain in operation. These repairs would progress after the items listed in the immediate repair category are complete.

Architectural:

- Replace metal siding - $107,500
- Replace exterior doors, frames and hardware - $38,500
- Upgrade office block washrooms finishes, vanities, cubicles partitions, accessories - $16,000

Mechanical:

- Replace the original building domestic water piping - $24,000
- Replace the server room split air conditioning unit - $4,500
- Replace the second floor split air conditioning unit - $6,000
- Remove and dispose of Paint Room ventilation equipment - $2,500

Electrical:

- Consider replacement of the outdoor loudspeakers - $2,000

Estimated total cost for mid-term repairs and upgrades:
$201,000 sub-total cost x 10% contingency = $221,100 total cost

4.1.3.3 Long-Term Maintenance and Repairs

This category includes expected maintenance, repair and replacement items that would be required over the next 10 to 20 years of operation, providing the other two categories of renovations and repairs were completed prior.

Architectural:

- Replace roof finishes - $213,000

Site/Civil:

- Replace concrete curbs - $135,000
- Replace storm water catch basins and CMP pipe - $132,500

Electrical:

- Replace electric heating equipment - $45,000

Estimated total cost for long-term repairs and upgrades:
$525,500 sub-total cost x 10% contingency = $578,100 total cost

CHAPTER 5 CAPITAL COST SUMMARY AND COMPARISON OF SCENARIOS

5.1 Capital Cost Summary

5.1.1 Table 2: Capital Cost Summary

Building/Action	Construction Costs
Bishops Falls Office/Warehouse	
Immediate (1-2 years)	$621,000
Mid-Term (3-10 years)	$221,100
Long-Term (10-20 years)	$578,100

Costs provided in these tables do not include HST. Costs provided are in current Canadian dollars and escalation values may have to be applied to renovations in future years to account for such factors as inflation, exchange rate, and competitiveness of construction industry.

This opinion of probable costs is presented on the basis of experience, qualifications, and best judgment. It has been prepared in accordance with acceptable principles and practices. Sudden market trend changes, non-competitive bidding situations, unforeseen labour and material adjustments and the like are beyond the control of CBCL Limited. We cannot warrant or guarantee that actual costs will not vary significantly from the opinion provided.

FINAL REPORT



Issued by:
Paul Sceviour, MASc., P.Eng.
Senior Mechanical Engineer

This document was prepared for the party indicated herein. The material and information in the document reflects CBCL Limited's opinion and best judgment based on the information available at the time of preparation. Any use of this document or reliance on its content by third parties is the responsibility of the third party. CBCL Limited accepts no responsibility for any damages suffered as a result of third party use of this document.

APPENDIX A

Site Photos – Bishops Falls Office/Warehouse

APPENDIX A

ARCHITECTURAL PHOTOS

Nalcor Assessments – Bishop Falls
Architectural Photos



Photo 1



Photo 2

Nalcor Assessments – Bishop Falls
Architectural Photos



Photo 3



Photo 4

Nalcor Assessments – Bishop Falls
Architectural Photos



Photo 5



Photo 6

Nalcor Assessments – Bishop Falls
Architectural Photos



Photo 7



Photo 8

Nalcor Assessments – Bishop Falls
Architectural Photos



Photo 9



Photo 10



Photo 11



Photo 12



Photo 13

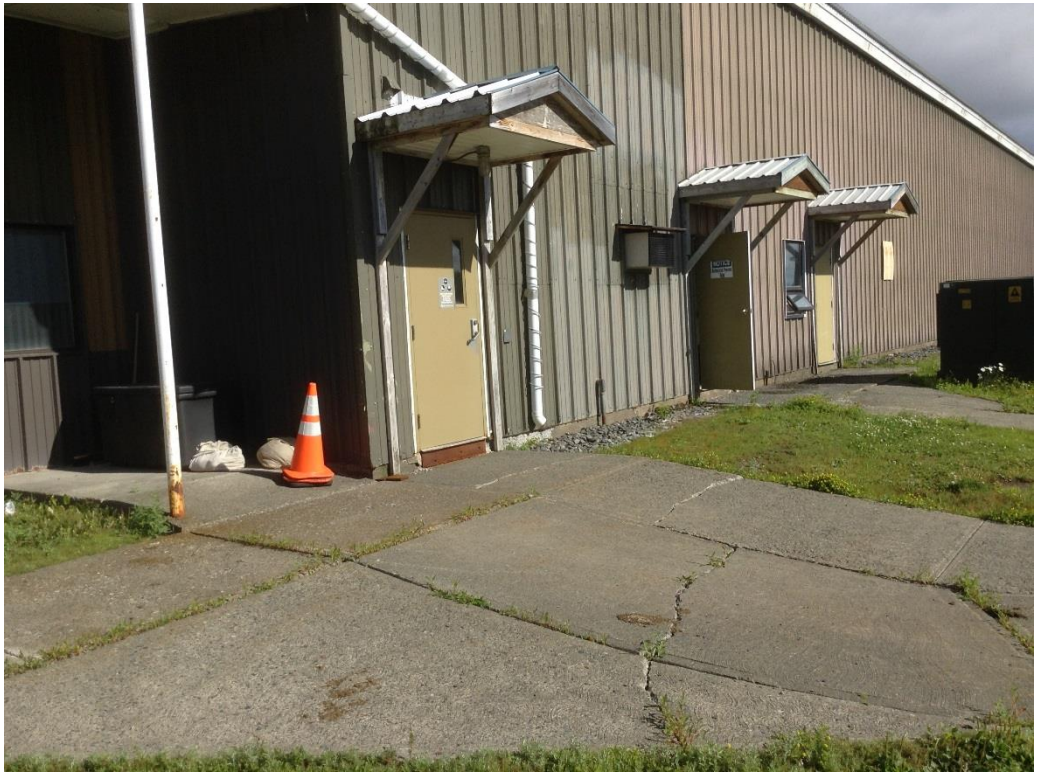


Photo 14



Photo 15



Photo 16

Nalcor Assessments – Bishop Falls
Architectural Photos



Photo 18



Photo 17



Photo 19



Photo 20

Nalcor Assessments – Bishop Falls
Architectural Photos



Photo 21



Photo 22

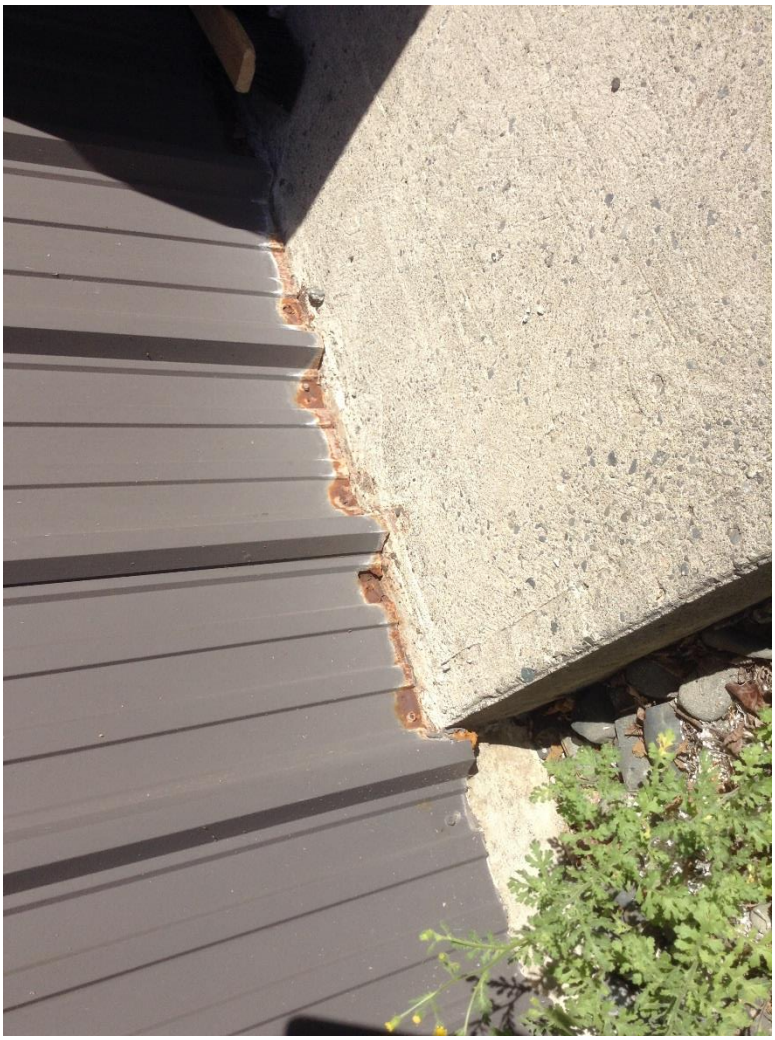


Photo 24



Photo 23



Photo 25

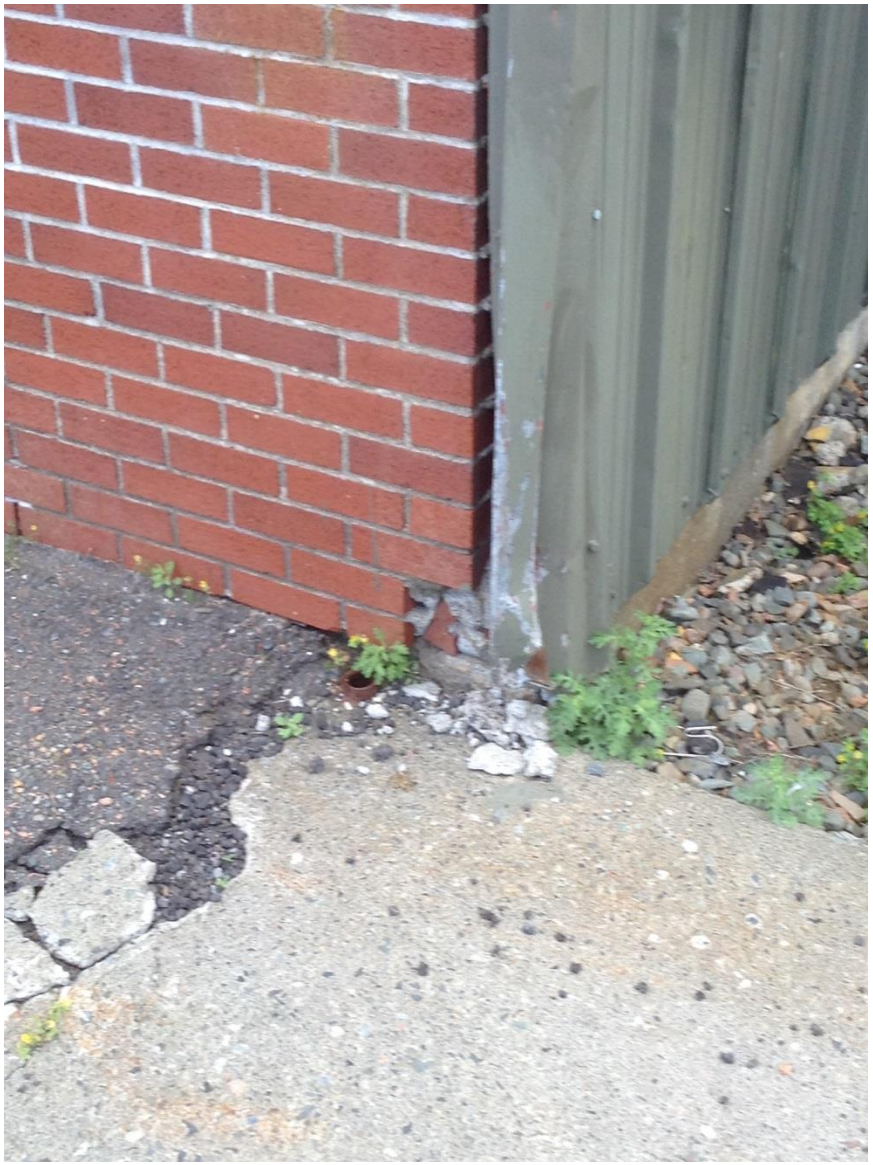


Photo 26



Photo 27



Photo 28



Photo 29



Photo 30



Photo 32



Photo 31



Photo 33



Photo 34



Photo 35



Photo 36

Nalcor Assessments – Bishop Falls
Architectural Photos



Photo 37



Photo 38

Nalcor Assessments – Bishop Falls
Architectural Photos



Photo 39



Photo 40

Nalcor Assessments – Bishop Falls
Architectural Photos



Photo 41



Photo 42

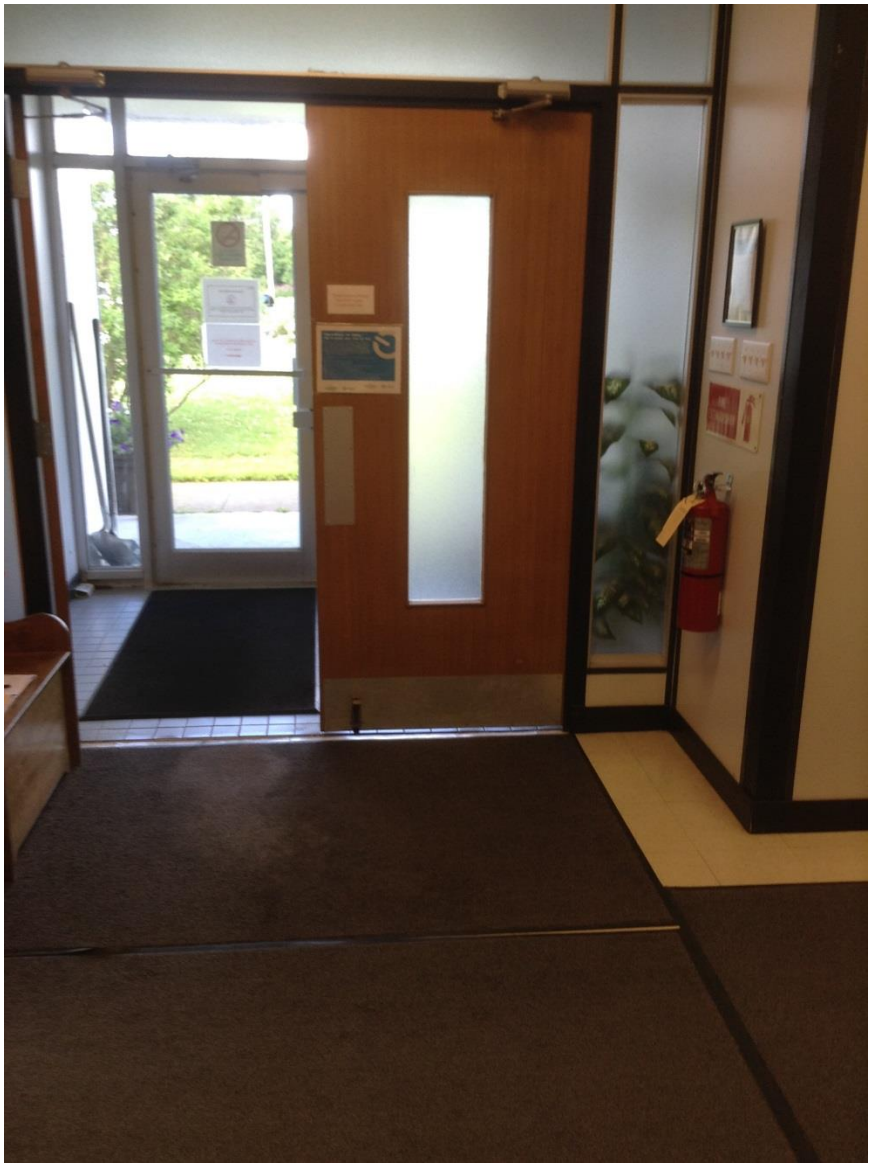


Photo 43



Photo 44

Nalcor Assessments – Bishop Falls
Architectural Photos



Photo 45



Photo 46



Photo 47



Photo 48



Photo 50



Photo 49



Photo 51



Photo 52



Photo 53



Photo 54



Photo 56



Photo 55

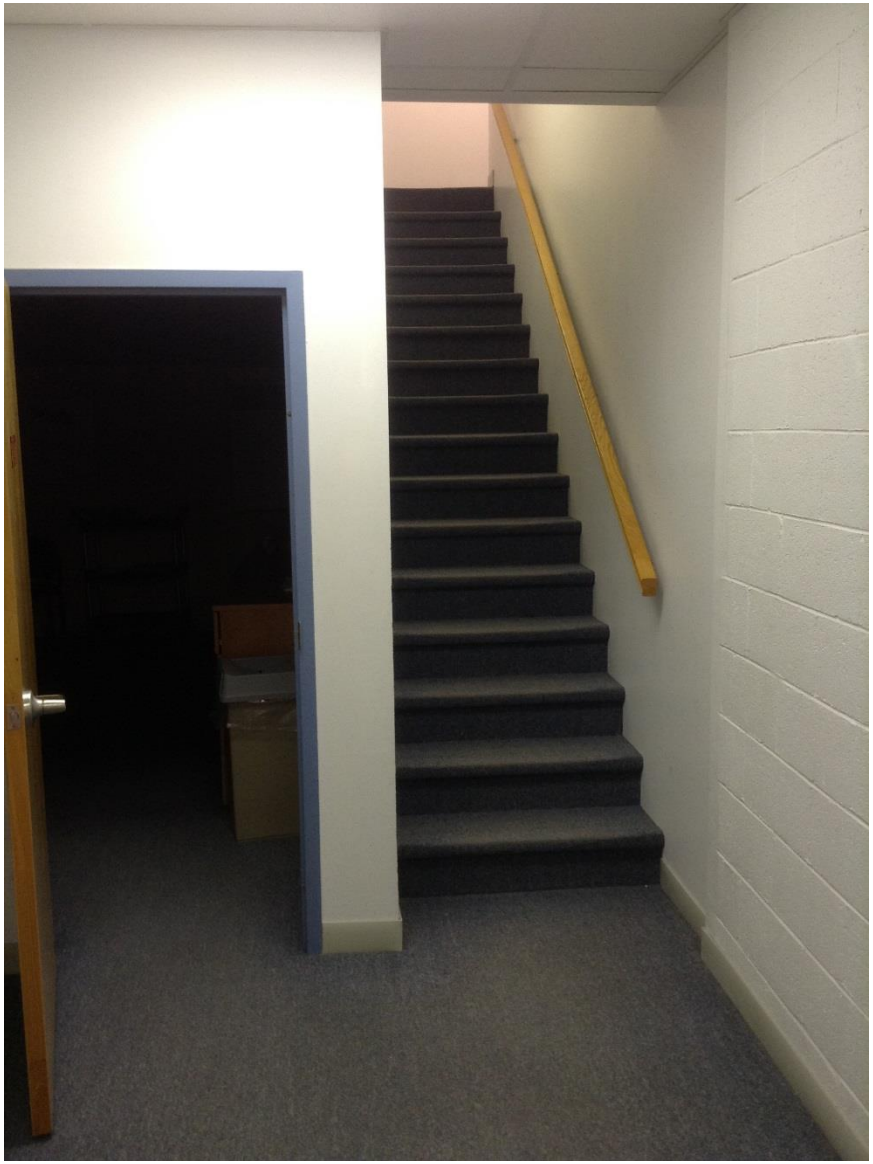


Photo 57



Photo 58

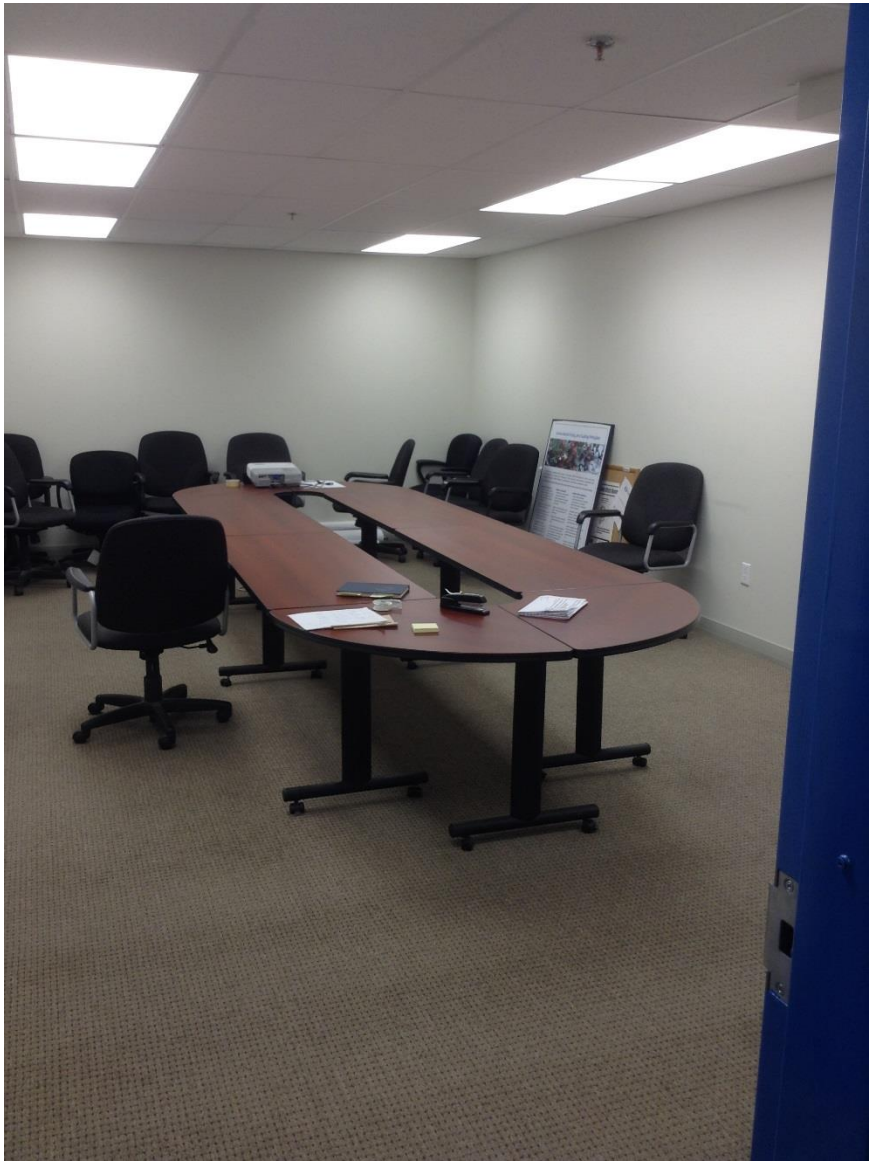


Photo 59



Photo 60

Nalcor Assessments – Bishop Falls
Architectural Photos



Photo 62



Photo 61

Nalcor Assessments – Bishop Falls
Architectural Photos



Photo 63



Photo 64

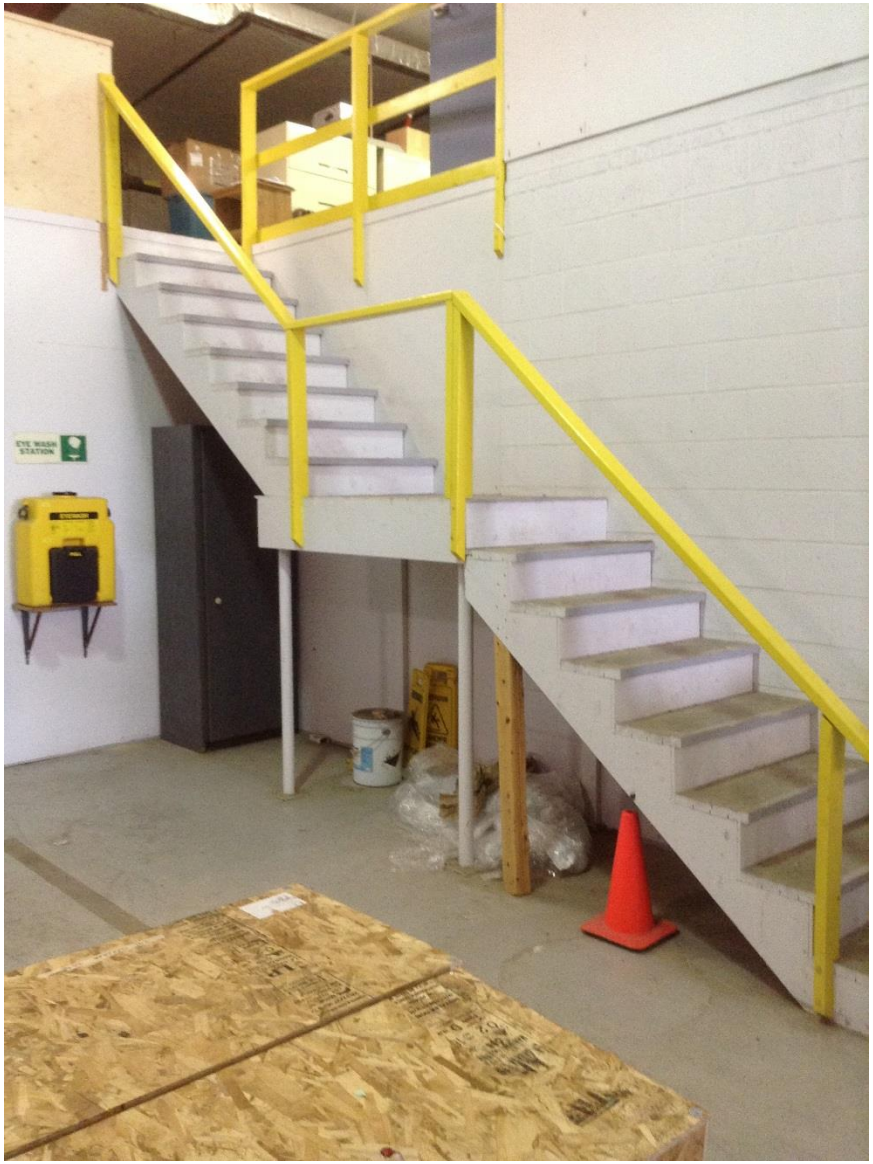


Photo 65



Photo 66

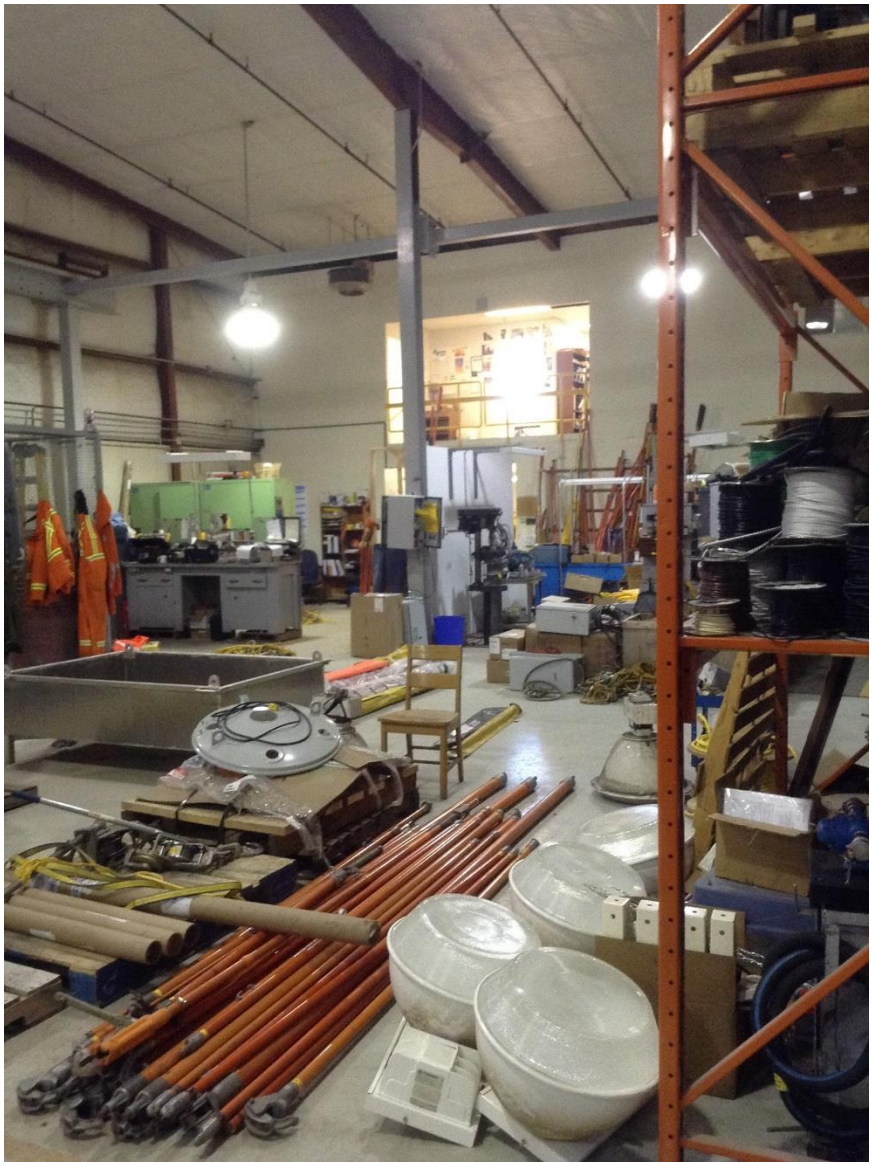


Photo 67



Photo 68

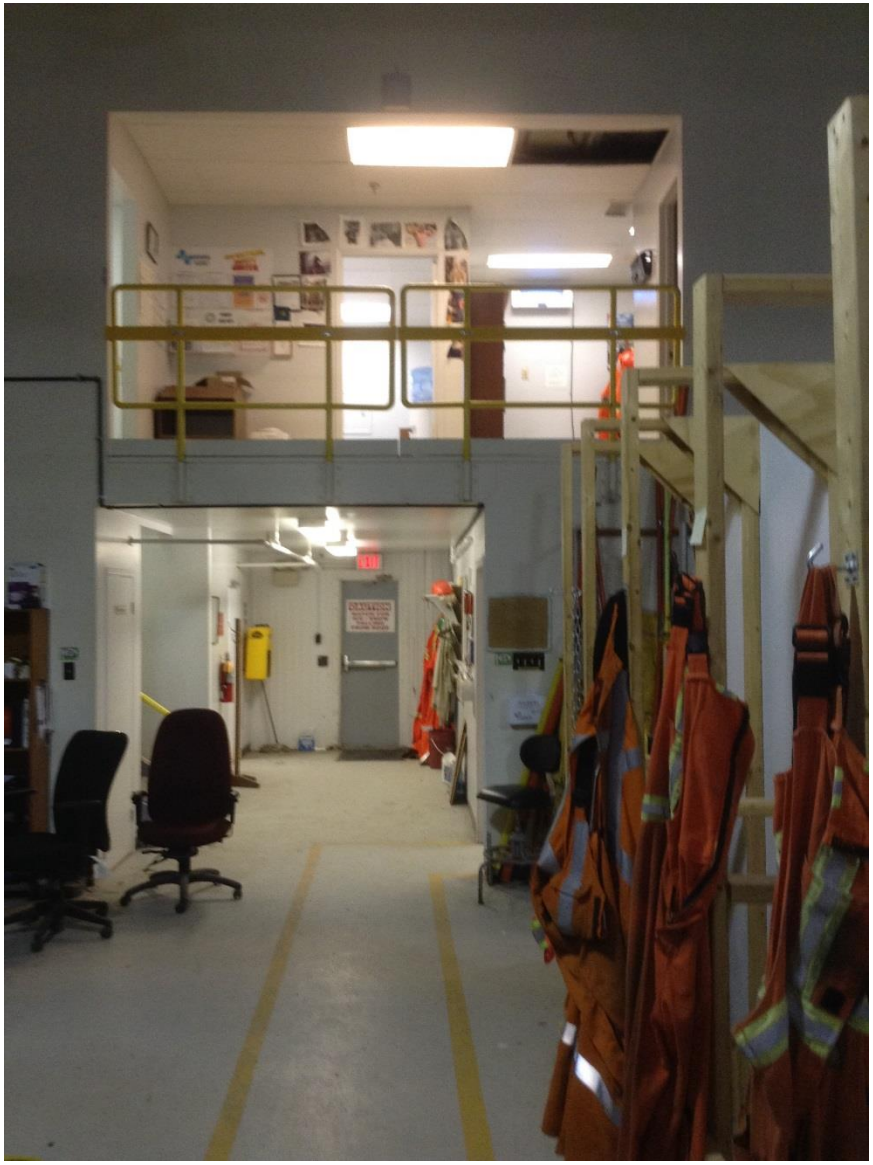


Photo 69



Photo 70



Photo 72



Photo 71



Photo 73



Photo 74



Photo 76

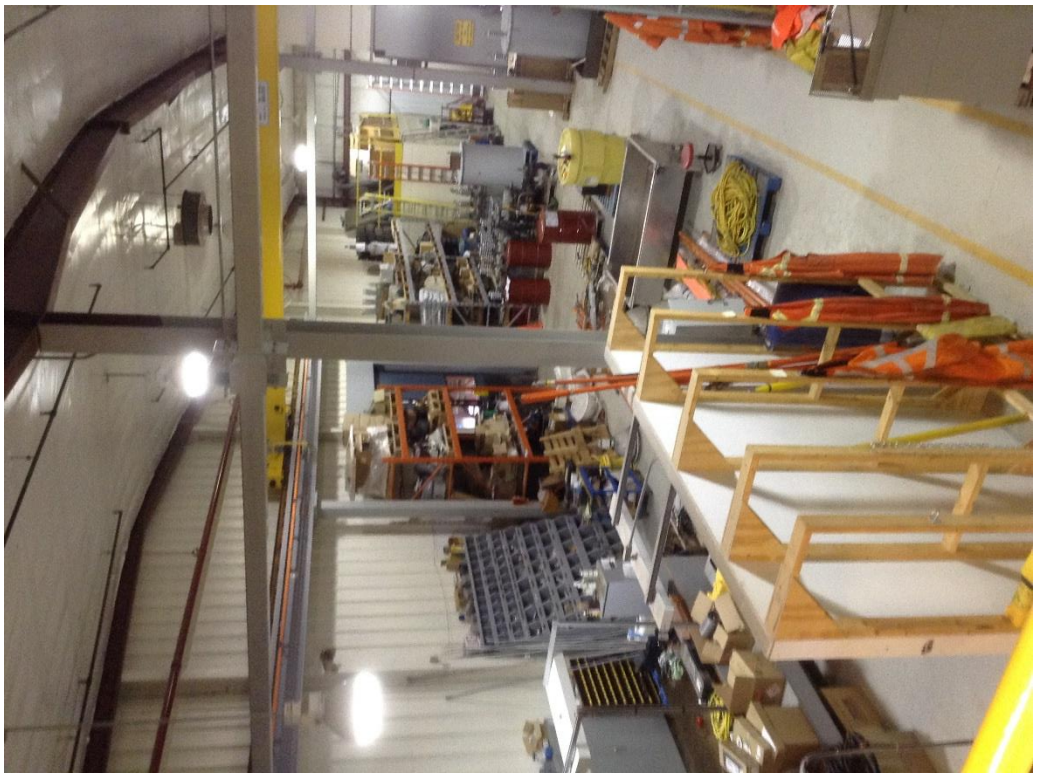


Photo 75



Photo 78



Photo 77

APPENDIX A

SITE CIVIL PHOTOS

Nalcor Assessments – Bishop Falls
Site Civil Photos



Photo 1 - Asphalt Cracking



Photo 2 - Asphalt Degrading

Nalcor Assessments – Bishop Falls
Site Civil Photos



Photo 3 - Asphalt Degrading



Photo 4 - Curb Damage

Nalcor Assessments – Bishop Falls
Site Civil Photos



Photo 5 - Concrete Walkway



Photo 6 - Concrete Pad at Loading Door

Nalcor Assessments – Bishop Falls
Site Civil Photos



Photo 7 - Doorway and Equpment



Photo 8 - Septic Tank Access

Nalcor Assessments – Bishop Falls
Site Civil Photos



Photo 9 - Stormwater Catch Basin



Photo 10 - Catch Basin

Nalcor Assessments – Bishop Falls
Site Civil Photos



Photo 11 - Catch Basin Not Up To Grade



Photo 12 - Catch Basin Chamber Undermined

Nalcor Assessments – Bishop Falls
Site Civil Photos



Photo 13 - CMP Corroded

APPENDIX A

STRUCTURAL PHOTOS

Nalcor Assessments – Bishop Falls
Structural Photos



Photo 1 - Vertical Crack in Foudation Wall



Photo 2 - Damage to Concrete Foundation Wall

Nalcor Assessments – Bishop Falls
Structural Photos



Photo 3 - Scaled Concrete on Foundation Wall



Photo 4 - Ants Entering Building Through Foundation Wall

Nalcor Assessments – Bishop Falls
Structural Photos



Photo 5 - Reinforced Building Frame



Photo 6 - Reinforced Building Frame and Additional Purlins

Nalcor Assessments – Bishop Falls
Structural Photos



Photo 7 - Timber Trusses Concealed by Vapor Barrier and Insulation



Photo 8 - Typical Building Frame

Nalcor Assessments – Bishop Falls
Structural Photos



Photo 9 - Deformation on Column Due to Impact (1)



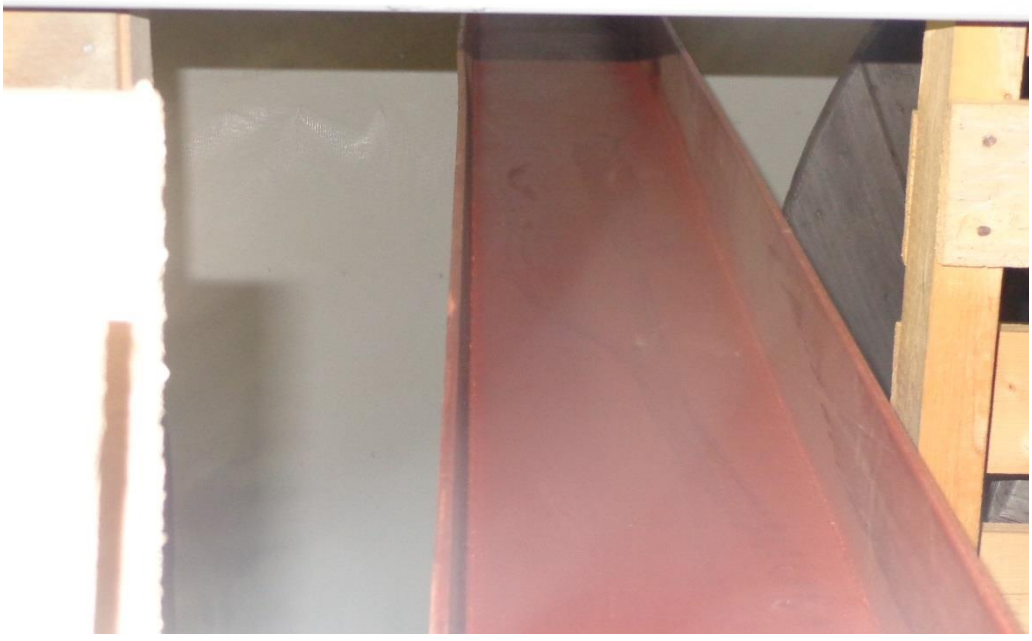


Photo 10 - Deformation in Column due to Impact (2)



Photo 11 - Deformation in Column due to Impact (3)

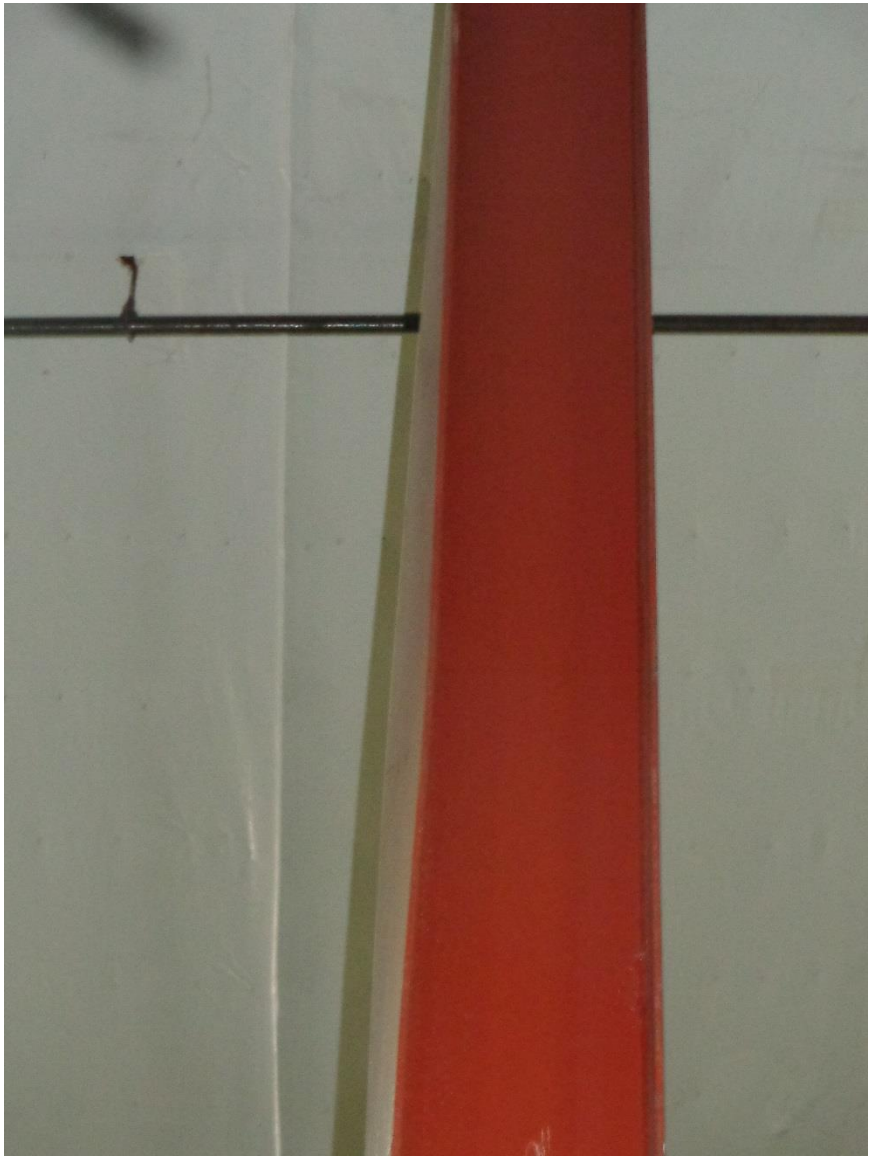


Photo 12 - Twist in Column Possibly Due to Overstress (1)



Photo 13 - Twist in Column Possibly Due to Overstress (2)



Photo 14 - Deformation in Girt

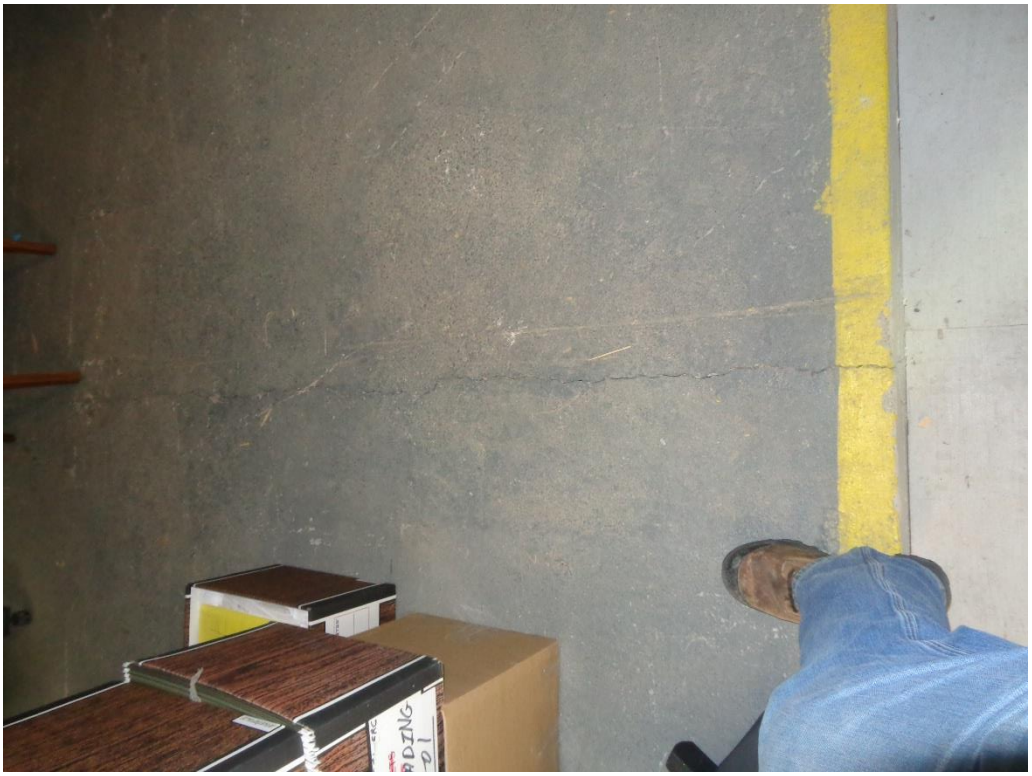


Photo 16 - Small Shrinkage Crack in Slab

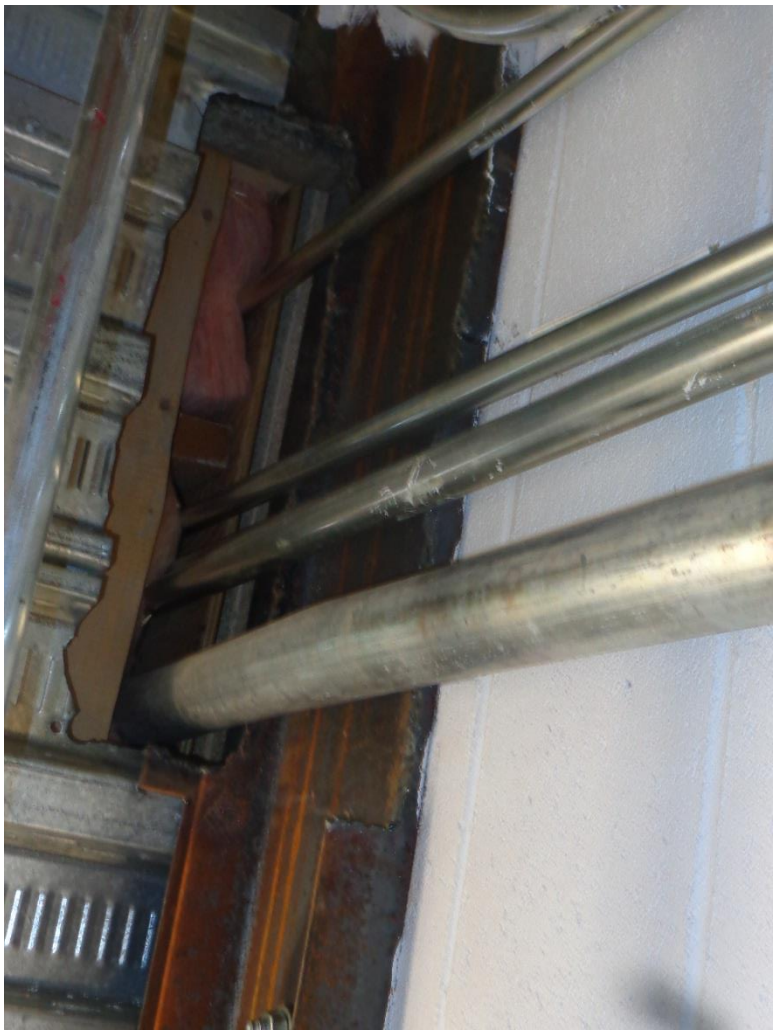


Photo 15 - Channel's Flanges Removed

Nalcor Assessments – Bishop Falls
Structural Photos



Photo 17 - Horizontal Crack in Slab



Photo 18 - Brick Veneer and Metal Cladding

Nalcor Assessments – Bishop Falls
Structural Photos



Photo 19 - Shelf Angle in Poor Condition



Photo 20 - Steel Lintel Over Window Openings



Photo 21 - Timber Equipment



Photo 22 - Post Not Bearing on Ground

Nalcor Assessments – Bishop Falls
Structural Photos



Photo 23 - Rotting Post of Equipment Platform

APPENDIX A

MECHANICAL PHOTOS

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 1 - Copper Vent Piping



Photo 2 – ABS Waste Piping

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 3 - Air Admittance Valve Mounted Incorrectly



Photo 4 - Vent Piping Terminating Through Exterior Wall

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 5 - Truck Bay Trench Drain



Photo 6 - Domestic Water Entrance

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 7 - Partially Insulated Domestic Water Piping



Photo 8 - Water Piping Not Properly Supported



Photo 9 - Coffee Station HWT



Photo 10 - Mezzanine Level HWT



Photo 11 - Office Extension HWT



Photo 12 - Water Barrel on Mezzanine Level



Photo 13 - Water closet



Photo 14 - Urinal with Electronic Flush Valve

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 15 - Vitreous China Lavatory

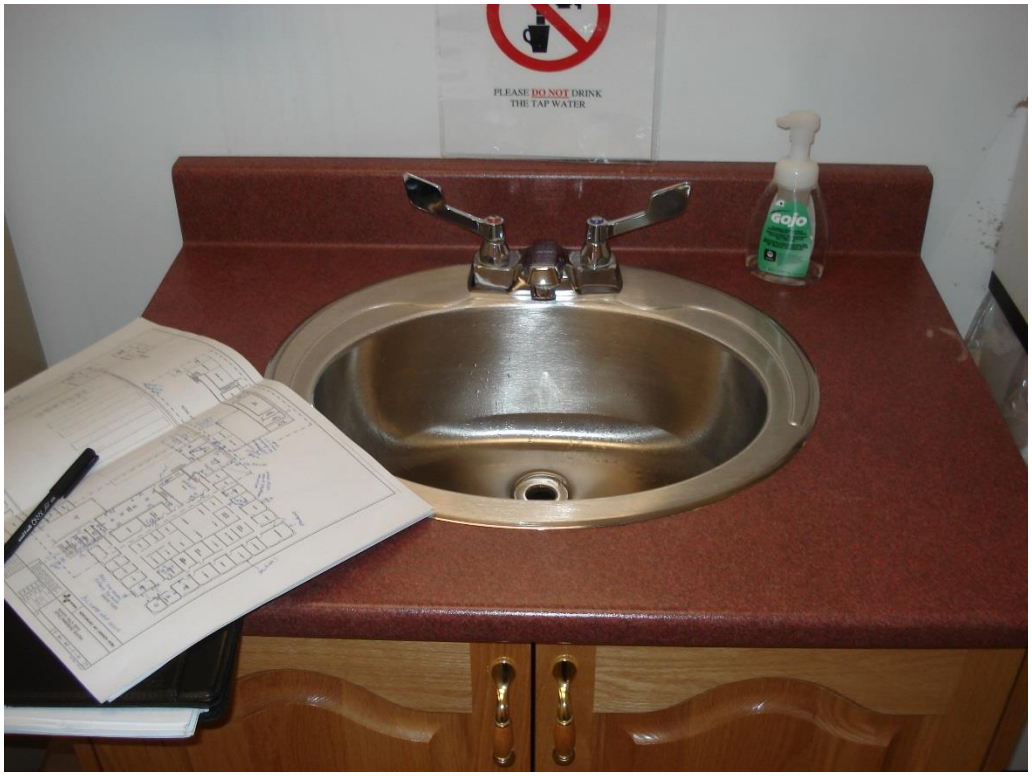


Photo 16 - Stainless Steel Lavatory



Photo 17 - Residential Grade Vanity



Photo 18 - Lunch Room Sink



Photo 19 - Laundry Tub



Photo 20 - Emergency Eyewash Station

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 21 - Office Area Rooftop AC Unit



Photo 22 - Insulated Supply Ductwork

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 23 - Zone Duct Heater



Photo 24 - Return Grilles Very Dirty

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 25 - Server Room Condenser Unit



Photo 26 - Server Room Evaporator Unit

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 27 - Front Office Area Condenser Unit



Photo 28 - Front Office Area Evaporator Unit

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 29 - Portable Air Conditioning Unit



Photo 30 - Transformer Shop Offices Evaporator Unit

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 31 - Workshop Wall AC Unit

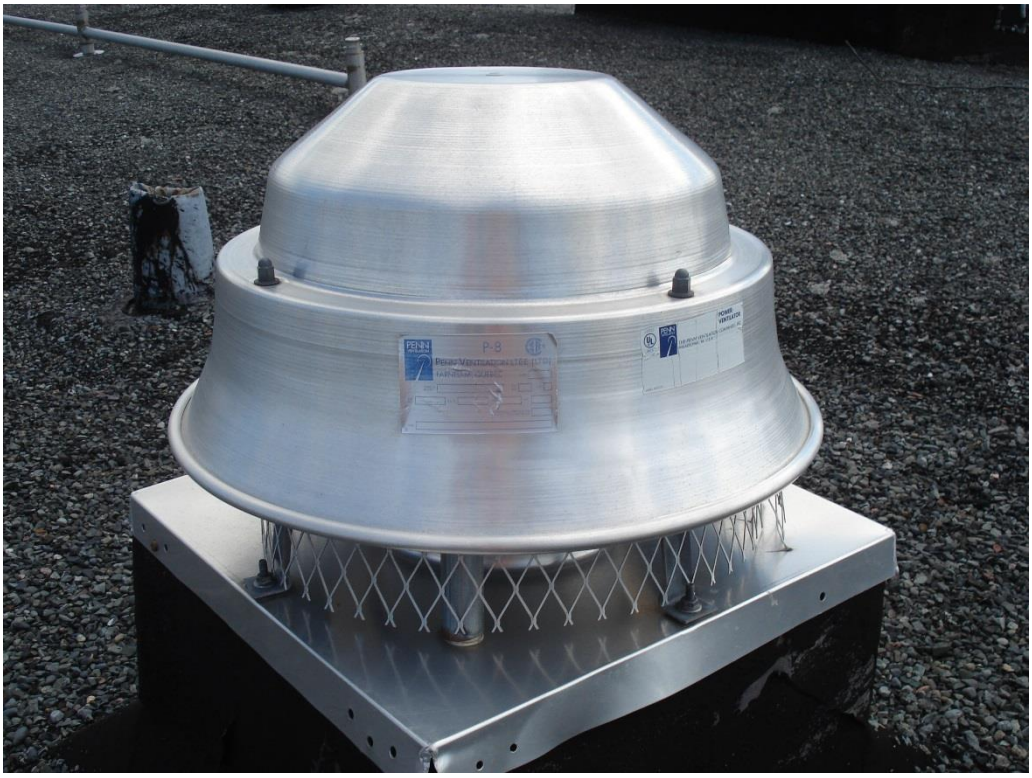


Photo 32 - Washroom Roof Exhaust Fan

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 33 – Paint Room Propeller Exhaust Fans

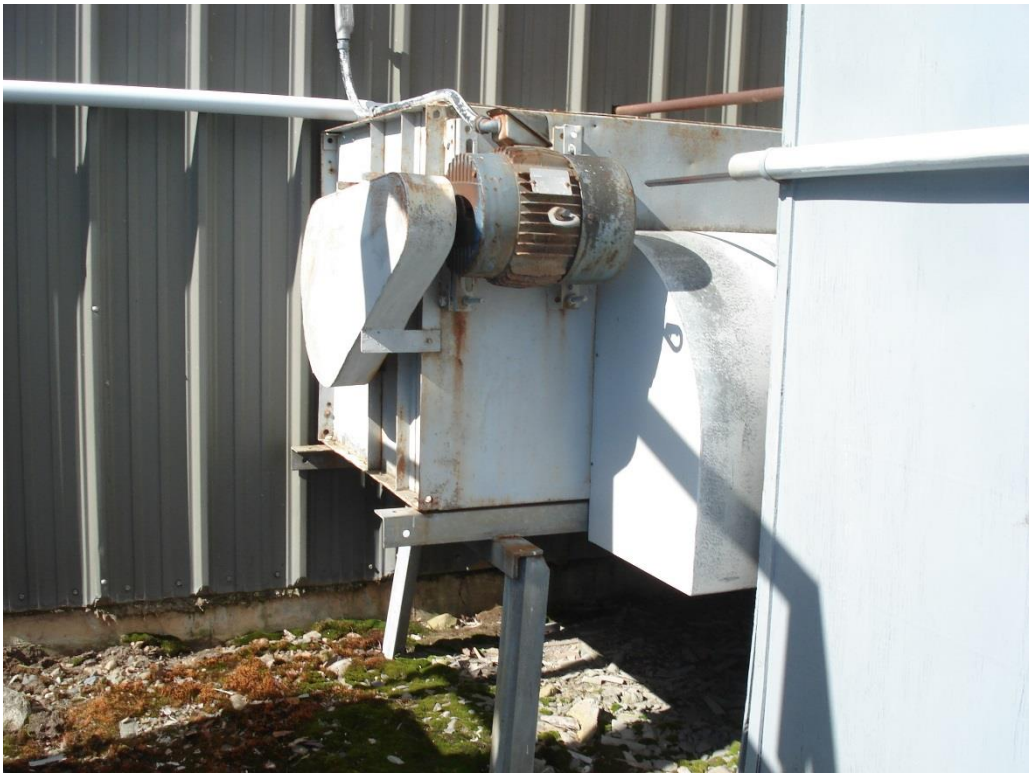


Photo 34 - Paint Room Make-up Air Unit

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 35 - Fume Extraction System



Photo 36 - Typical Washroom Exhaust Fan

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 37 - Exhaust Fan Wall Caps



Photo 38 - Lunch Room Ceiling Exhaust Fan

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 39 - Paint Storage Exhaust Air Grille and Ducting



Photo 40 - Oil Test Lab Exhaust Hood

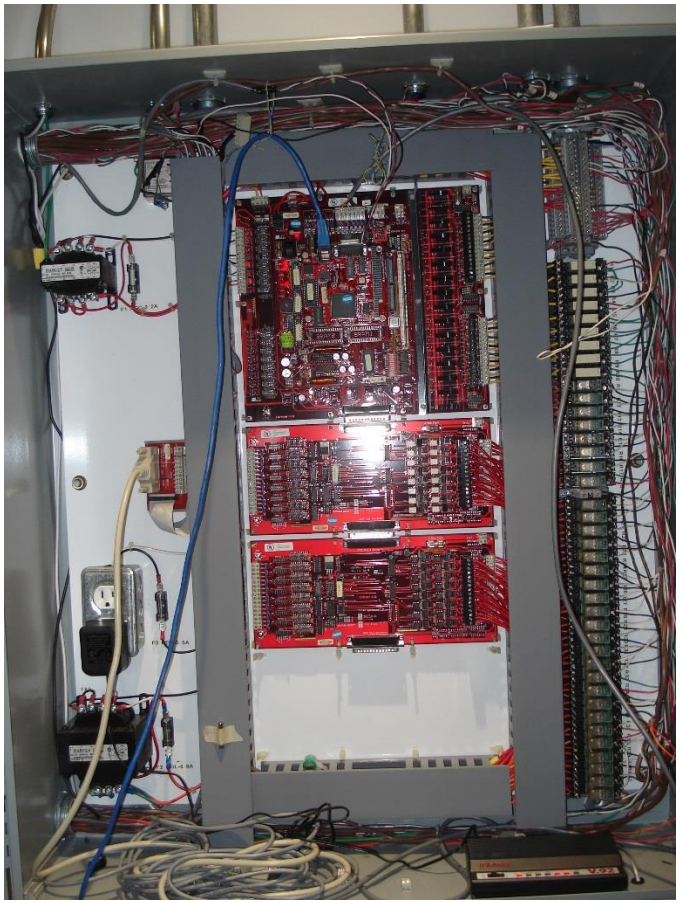


Photo 41 - BAS Control Panel



Photo 42 - BAS Zone Thermostat

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 43 - Typical Split AC System Thermostat



Photo 44 - Wet Sprinkler System Alarm Valve



Photo 46 - Dry Sprinkler System Valve

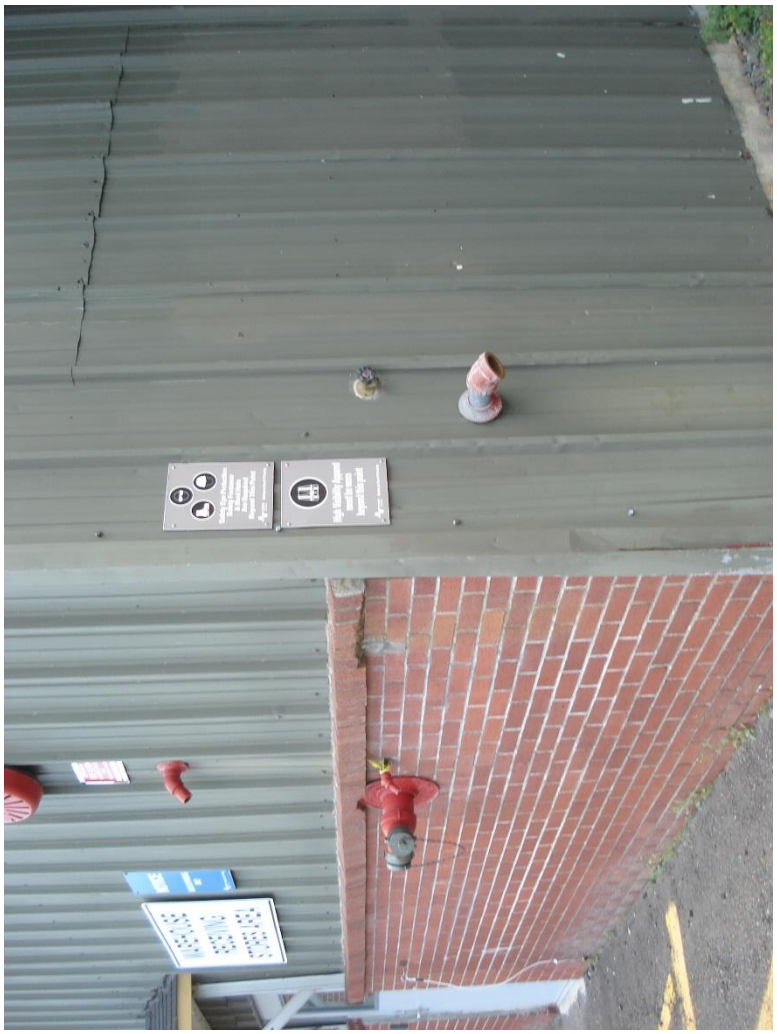


Photo 45 - Fire Department Connection and Alarm Bell

Nalcor Assessments – Bishop Falls
Mechanical Photos



Photo 47 - Rack Storage Very Close to Roof

APPENDIX A

ELECTRICAL PHOTOS

Nalcor Assessments – Bishop Falls
Electrical Photos



Photo 1



Photo 2

Nalcor Assessments – Bishop Falls
Electrical Photos



Photo 3



Photo 4

Nalcor Assessments – Bishop Falls
Electrical Photos



Photo 5



Photo 6

Nalcor Assessments – Bishop Falls
Electrical Photos

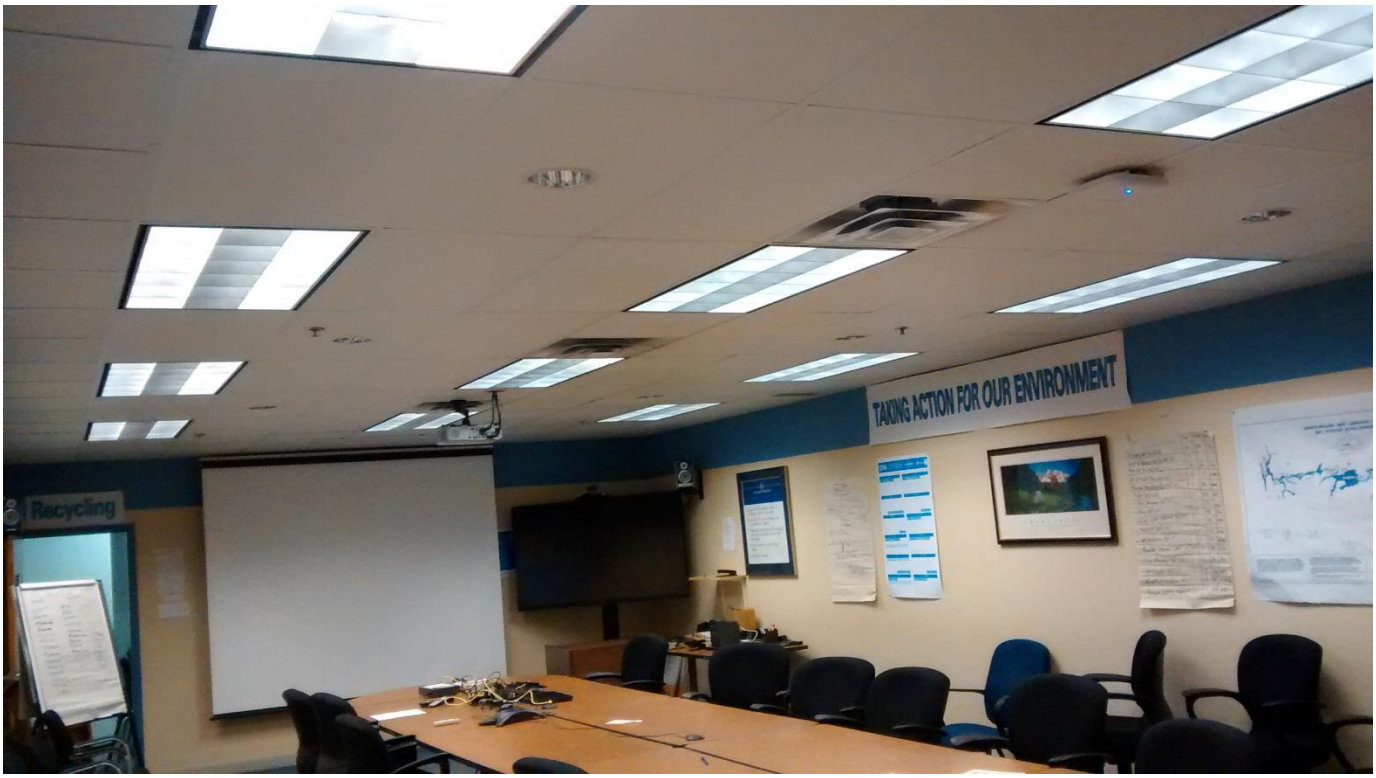


Photo 7



Photo 8



Photo 9



Photo 10

Nalcor Assessments – Bishop Falls
Electrical Photos



Photo 11



Photo 12

Nalcor Assessments – Bishop Falls
Electrical Photos



Photo 13



Photo 14

Nalcor Assessments – Bishop Falls
Electrical Photos



Photo 15



Photo 16

Nalcor Assessments – Bishop Falls
Electrical Photos

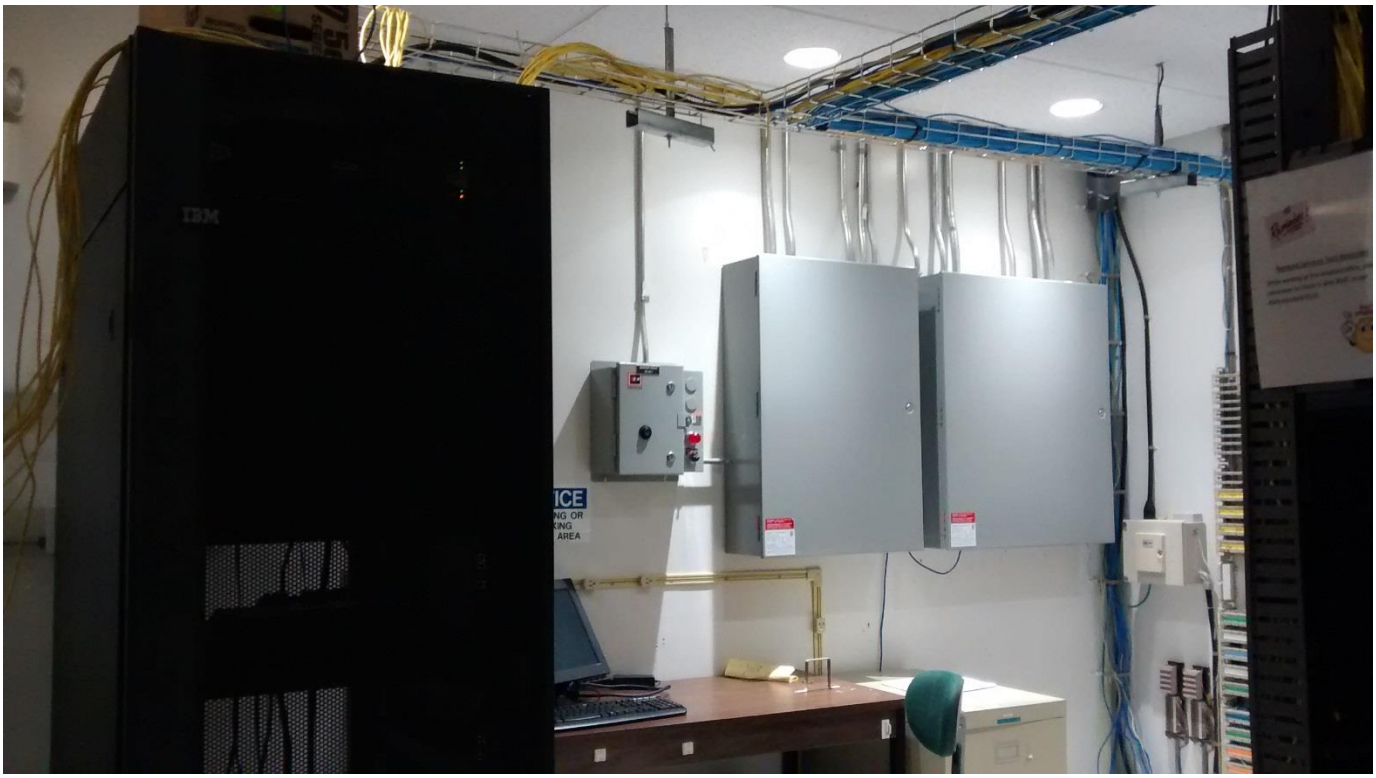


Photo 17



Photo 18

Nalcor Assessments – Bishop Falls
Electrical Photos



Photo 19



Photo 20

Nalcor Assessments – Bishop Falls
Electrical Photos



Photo 21



Photo 22

Nalcor Assessments – Bishop Falls
Electrical Photos



Photo 23



Photo 24

APPENDIX A

ENVIRONMENTAL PHOTOS



Photo 1 – Warehouse Safety Cabinet



Photo 2 – Warehouse Safety Cabinet



Photo 4 – Transformer Shop Oil Drums



Photo 3 – Warehouse Safety Cabinet

Nalcor Assessments – Bishop Falls
Environmental Photos



Photo 5 – Transformer Shop Oil Pails



Photo 6 – Paint Room Oil Drums



Photo 7 – Paint Storage Safety Cabinet



Photo 8 – Paint Storage Safety Cabinet

Nalcor Assessments – Bishop Falls
Environmental Photos



Photo 9 – Paint Storage Flammable Combustible Liquids



Photo 10 – Paint Storage Flammable Combustible Liquids

Nalcor Assessments – Bishop Falls
Environmental Photos



Photo 11 - Paint Storage Flammable Combustible Liquids



Photo 12 - Paint Storage Flammable Combustible Liquids

Nalcor Assessments – Bishop Falls
Environmental Photos



Photo 13 – 4,540 L Transformer Oil Tank



Photo 14 – 18,000 L Transformer Oil Tank (Used Oil)

Nalcor Assessments – Bishop Falls
Environmental Photos



Photo 15 – Tank Piping Not Properly Supported



Photo 16 - Tank Piping Not Properly Supported



Photo 17 - Tank Piping Not Properly Supported



Photo 18 - Tank Piping Not Properly Supported

Nalcor Assessments – Bishop Falls
Environmental Photos



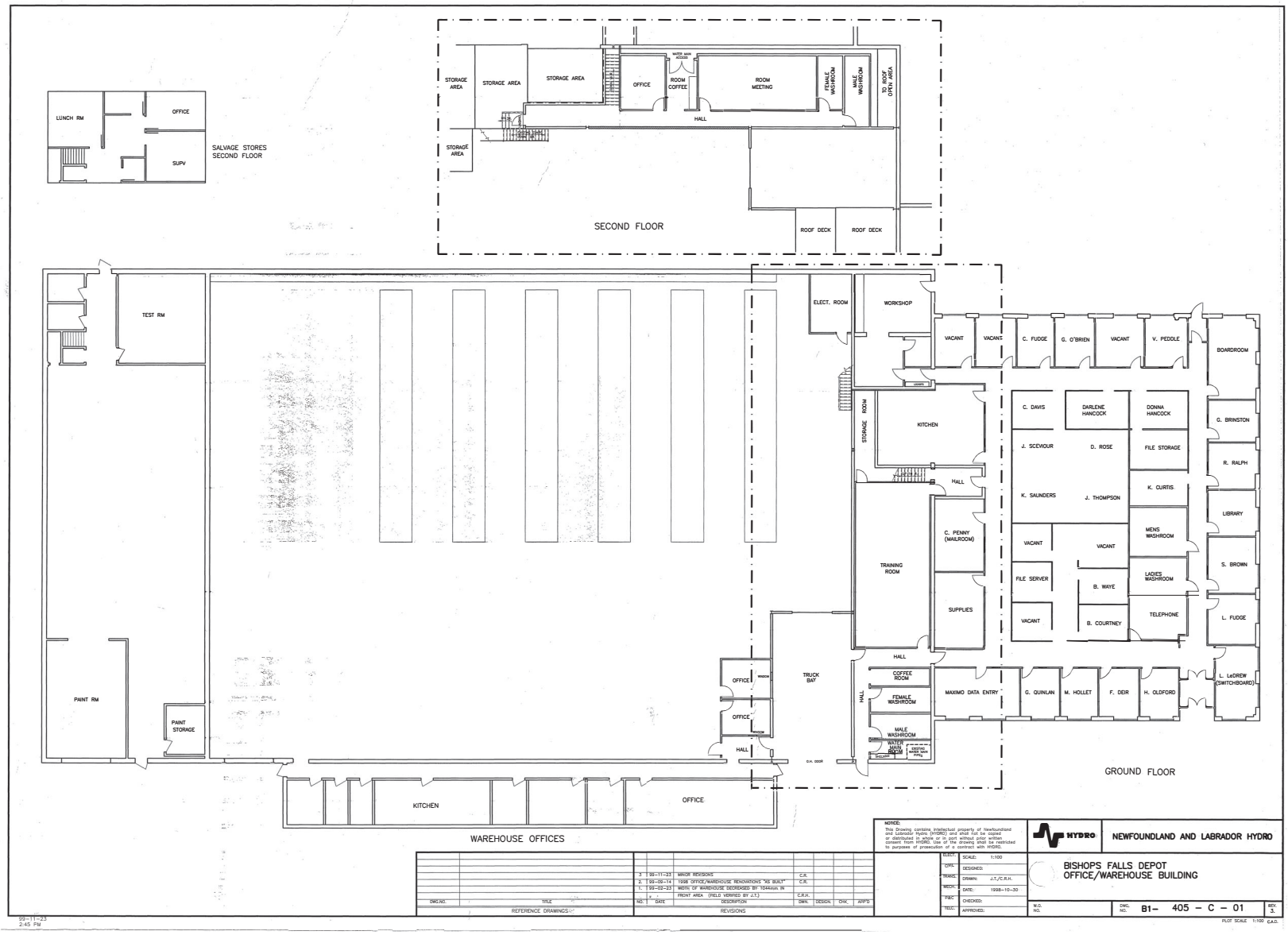
Photo 19 – Transformer Oil Supply and Fill Pipes



Photo 20 – Waste Oil Transfer Pump

APPENDIX B

Existing Floor Plans


LUNCH RM
OFFICE
SUPV
SALVAGE STORES
SECOND FLOOR
STORAGE AREA
STORAGE AREA
STORAGE AREA
OFFICE
ROOM COFFEE
ROOM MEETING
FEMALE WASHROOM
MALE WASHROOM
TO ROOF OPEN AREA
HALL
STORAGE AREA
SECOND FLOOR
ROOF DECK
ROOF DECK
TEST RM
ELECT. ROOM
WORKSHOP
VACANT
VACANT
C. FUDGE
G. O'BRIEN
VACANT
V. PEDDLE
BOARDROOM
STORAGE ROOM
KITCHEN
C. DAVIS
DARLENE HANCOCK
DONNA HANCOCK
G. BRINSTON
J. SCEVIOUR
D. ROSE
FILE STORAGE
R. RALPH
HALL
K. SAUNDERS
J. THOMPSON
K. CURTIS
LIBRARY
C. PENNY (MAILROOM)
VACANT
VACANT
MENS WASHROOM
TRAINING ROOM
FILE SERVER
B. WAYE
LADIES WASHROOM
S. BROWN
SUPPLIES
VACANT
B. COURTNEY
TELEPHONE
L. FUDGE
HALL
COFFEE ROOM
OFFICE
TRUCK BAY
MAXIMO DATA ENTRY
G. QUINLAN
M. HOLLET
F. DEIR
H. OLDFORD
L. LeDREW (SWITCHBOARD)
FEMALE WASHROOM
OFFICE
HALL
MALE WASHROOM
PAINT RM
PAINT STORAGE
KITCHEN
OFFICE
WAREHOUSE OFFICES
GROUND FLOOR
NOTICE:
This Drawing contains intellectual property of Newfoundland and Labrador Hydro (HYDRO) and shall not be copied or distributed in whole or in part without prior written consent from HYDRO. Use of the drawing shall be restricted to purposes of prosecution of a contract with HYDRO.
HYDRO
NEWFOUNDLAND AND LABRADOR HYDRO
BISHOPS FALLS DEPOT
OFFICE/WAREHOUSE BUILDING
3 99-11-23 MINOR REVISIONS C.R.
2 99-09-14 1998 OFFICE/WAREHOUSE RENOVATIONS "AS BUILT" C.R.
1 99-02-23 WIDTH OF WAREHOUSE DOORHEAD 19' 764mm IN FRONT AREA (FIELD VERIFIED BY J.T.) C.R.H.
NO. DATE DESCRIPTION DWN. DESIGN. CHK. APP'D
REVISIONS
DWG.NO. TITLE
REFERENCE DRAWINGS:
ELECT.
CIVIL
TRANS.
MECH.
P&C
TELC.
SCALE: 1:100
DESIGNED:
DRAWN: J.T./C.R.H.
DATE: 1998-10-30
CHECKED:
APPROVED:
W.O. NO.
DWG. NO. B1- 405 - C - 01
REV. 3
PLOT SCALE 1:100 C.A.D.
99-11-23
2:45 PM

Appendix F

Building and Infrastructure Condition Assessment – Whitbourne Eastern Area Depot (2017)





Building and Infrastructure Condition Assessment Whitbourne Eastern Area Depot

(Whitbourne, NL)



163046.00 ● Final Report ● June 2017

ISO 9001
Registered Company

Prepared for:

nalcor energy

Prepared by:

CBCL LIMITED
Consulting Engineers

Issued for Final	Paul Sceviour	Jun 16, 2017	Paul Sceviour
Issued for Review	Paul Sceviour	Mar 23, 2017	Paul Sceviour
Issue or Revision	***Reviewed By:***	***Date***	***Issued By:***

CBCL LIMITED
Consulting Engineers

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CBCL Project No 163046.00

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CHAPTER 1 REPORT OVERVIEW

1.1 RFP and Consultant Group

In June 2016, the Newfoundland and Labrador Hydro (referred to as the "NLH" hereafter) issued a Request for Proposals to undertake the building and infrastructure condition assessments for various line depots, office facilities, and substation control buildings throughout the province. The sites included:

- Line Depots
  - Ramea
  - Flowers Cove
  - Roddickton
- Office Facilities and Control Buildings
  - Bishop's Falls (Office Building Only)
  - Whitburn Eastern Area Depot
  - Doyles 138 kV Facility
  - Grandy Brook 138 kV Facility
  - Howley 138 kV Facility
  - Springdale 138 kV Facility

CBCL Limited responded to the request on May 27, 2016, and was subsequently awarded the project on June 15, 2016.

The consultant team that performed this assessment consisted of a multi-disciplined engineering team with CBCL Limited performing structural, mechanical, electrical, and environmental tasks, and Glenn Barnes Architecture Inc. performing architectural and functional programming tasks.

This report contains the results of those exercises and provides our professional assessments, recommendations as to the current condition, suitability of use, required code upgrades, recommended upgrades, recommendations to suit future needs, and opinion of probable construction cost for recommendations.

1.2 Scope of Work

The Request for Proposals document contained the terms of reference which outlined the objectives and scope of the project. The assessment has several objectives:

- to review the general condition of the building and site infrastructure including architectural, structural, mechanical, electrical, and environmental;
- provide recommendations of renovations to continue operating existing facilities in view of present and future needs, and
- provide preliminary functional programming based on the client current needs (for storage, operations, etc.) and future needs to determine the most efficient uses of the assessed facilities.

1.3 Site Audits

Site audits were carried out during the weeks of July 25th and August 1st. Prior to the site work, CBCL requested any available plans and prior documents or information on the facilities. Limited information was available so the bulk of the information contained in this report was obtained from onsite review and from information provided by on site personnel. Upon arriving at the various sites the consultant team checked in with site personnel and undertook site specific safety orientation were required.

1.3.1 Main Depot Building

This 800 square meter pre-engineered metal building was originally constructed circa 1974 with a 12 meter extension having been added to the warehouse many years later. The building consists of two on grade levels on concrete foundations and slabs on grade. The building houses offices, training room, staff lunch rooms, washrooms, warehouse, and various individual workshop units. The building has pre-formed metal siding and steel roof.



Site utilities include a well water supply and a septic system for sanitary drainage. The site itself is gravel and slopes to lower elevations to the south side of the site. The depot yard is fully fenced with the front of the depot building forming part of the perimeter.

1.3.2 Maintenance Garage

This maintenance garage building has a 133 square metre footprint/first floor area plus a small 18.4 square meter second floor. The age of the building is unknown but it is not contemporary. The building houses a repair garage with an in floor repair pit and equipment workspace. A single washroom/laundry and storage room complete the first floor. The second floor, accessed via open wood stairs houses an office plus a compressor and parts storage room. The building is of wood frame with sloped roof clad in asphalt shingles. Siding consists of vertical pre-painted metal which is in several colours and is significantly faded. Exterior doors



include one hollow metal personnel door in a pressed steel frame which requires re-painting. One large pre-painted insulated steel overhead door provides vehicle access. The building is in fair condition with significant upgrading required. Interior finishes of the walls and ceilings consist of painted hardboard. Foundations are of poured concrete with the first floor being poured in placed concrete slabs.

Site utilities include a well water supply and a septic system for sanitary drainage.

1.3.3 Storage Building

This contemporary building is a Quonset hut style fabricated with arced shape of self-supporting galvanized steel panels. The 41 square meter single level on grade structure is founded on a concrete foundation and slab on grade floor. The building is uninsulated. The building acts as storage space for ATVs, snowmobiles and other line equipment. The building has a single uninsulated pre-painted steel overhead door and a single hollow metal person door in a pressed steel frame. One turbine type roof exhaust ventilator sits atop the centre of the roof.



The Storage Building does not have any site services.

1.3.4 Carpenter Building

This 37 square meter wood frame building consists of a single open interior space which was formerly a workshop but now acts as storage for grounds maintenance equipment, tires, line tools, and other equipment. The building has a sloped roof with asphalt shingles, vinyl siding, one residential type metal access door, vinyl sliding windows and is founded on what appears to be wood blocks with skirted space between floor and grade. The building is in fair to good condition.



The Carpenter Building does not have any site services.

1.4 Findings and Recommendations

1.4.1 Main Depot Building Findings

The building is in good condition but the envelope is showing its age and upgrades should be considered in the next 3-5 years. Some codes upgrading work is also required.

1.4.2 Main Depot Building Recommendations

Near term recommendations that should be planned to be undertaken within the next two years have been put forward for architectural, structural, site, mechanical, electrical, and environmental and are summarized as follows.

Architectural:

- Replace stained ceiling tiles.
- Repoint brick.
- Provide non-skid treads c/w tactile to corridor stairs.
- Correct code exiting and fire ratings deficiencies.
- Add gutter and downspout systems.
- Paint doors and frames.
- Provide correct code to code guards and stair rails in shops and warehouse.

Structural:

- Foundation wall should be exposed in locations where larger horizontal cracks and spalling is noted. It is recommended to remove cladding and carry out required excavation in the location of the damage to uncover full extent of the damage. Once the full damage of the crack is determined an appropriate repair detail can be recommended.
- All tools must be removed from horizontal cross bracing.
- Cracks in concrete block partition walls possibly caused by settlement should be monitored to ensure condition does not worsen.

Site/Civil:

- Make repairs to site fencing.

Mechanical:

- Replace any ABS piping present in the office area return air plenum with copper or plenum rated plastic DWV.
- Replace domestic hot water tank.
- Provide insulation on uninsulated domestic water piping.
- Verify office area control operation and set up for continuous operation during occupied periods.
- Inspect and service office area steam humidifier.
- Provide a dedicated cooling system for the Electrical/Server Room.
- Replace the warehouse/workshop area Lunch Room range hood.
- Rebalance outside air rates to office area.
- Provide heat recovery ventilation system to provide minimum outside air to warehouse/shop area of building.

Electrical:

- The old exterior lights and associated controls should be replaced.
- Investigate and repair baseboard heater in space off of warehouse area.
- All outdoor receptacles, including the outlet boxes and the weather protective covers need replacement.
- Replace any outdated emergency lighting batteries.

- Installation of visual alarms in fire alarm system for aiding any potential hearing impaired occupants.
- Relocate fire alarm annunciator/control panel next to the main entrance as required by NBCC.

Environmental:

- Indoor air quality should be addressed as per the recommendation in the mechanical section of this report.
- Stained soil in the depot yard should be removed and properly disposed of. Stains on interior floors should be cleaned.
- Stored propane cylinders should be moved to an outdoor storage area.

Mid-term recommendations that should be planned to be done in the next 3-10 years are architectural, mechanical, and electrical and are summarized as follows.

Architectural:

- Replace metal siding.
- Replace remaining fibreglass overhead doors.
- Paint interior of building.
- Replace metal roofing.

Mechanical:

- Replace copper domestic water piping throughout facility.

Electrical:

- Install new panelboards with sufficient spare capacity.

1.4.3 Maintenance Garage Findings

The building is in fair condition with interior and exterior finishes upgrading recommended within the next few years. Codes upgrading related to the second floor fire rating and exiting is recommended in the short term. Covering exposed hardboard is recommended in the short term due to its flame spread rating.

1.4.4 Maintenance Garage Recommendations

Near term recommendations that should be planned to be undertaken within the next two years have been put forward for architectural, structural, mechanical, electrical, and environmental and are summarized as follows.

Architectural:

- Fire rate laundry room.
- Clean building interior.
- Reconstruct stairs to meet code.
- Provide emergency egress from opposite end of repair pit plus electrical and ventilation to code.
- Provide attic access hatch and study attic condition and attic ventilation. Add ventilation and insulation to code if required.

- Firerate the second floor and the exit from it to the exterior.
- Paint exterior door.
- Paint building interior.

Structural:

- The damaged concrete adjacent to the man door should be repaired.

Mechanical:

- Modify plumbing vent piping to be code compliant.
- Replace existing service pit sump pump with one rated for hazardous location including associated wiring.
- Presence of an oil interceptor and regular maintenance should be confirmed. If an interceptor is not present one should be installed and connected to the building floor drainage system.
- Replace hot water tank.
- Extend hot water tank relief piping to within 300mm of floor or less providing an air break.
- Insulate accessible domestic hot and cold water piping.
- Provide a domestic water hose reel in the service bay area.
- Provide a heat recovery unit to meet minimum ventilation requirements.
- Investigate and repair any issues with the service pit exhaust system. Replace exhaust fan with one of non-spark construction and suitable for conveyance of combustible gases. Provide visual system operation proving light.
- Provide welding fume extraction exhaust system.
- Increase general exhaust rates if required and provide tempered make-up air system for general exhaust capacity and pit and welding exhaust systems.
- Upgrade gas detection system with additional sensors, visual and audible alarm indication, and interlock with exhaust and make-up air systems.
- Provide nitrogen dioxide gas detection system if diesel vehicles are serviced in the garage.

Electrical:

- All old interior and exterior lighting fixtures to be replaced. Install new photocell control for the exterior lighting.
- Service pit lighting and wiring to be replaced with suitable material for hazardous locations.
- Service pit receptacles and wiring should be removed or replaced with suitable material for hazardous locations.

Environmental:

- Stored propane and acetylene cylinders should be moved to an outdoor storage area.

Mid-term recommendations that should be planned to be done in the next 3-10 years are architectural and electrical and are summarized as follows.

Architectural:

- Replace metal siding.
- Replace roof shingles.

Electrical:

- New main disconnect and panelboard with sufficient spare capacity to be installed.

- All old receptacles and lighting switches, including the outlet boxes and faceplates to be replaced.

1.4.5 Storage Building Findings

The building is in good condition, requiring only minor regular maintenance.

1.4.6 Storage Building Recommendations

Near term recommendations that should be planned to be undertaken within the next two years have been put forward for architectural and are summarized as follows.

Architectural:

- Seal hole in door frame, replace corroded hinges, and upgrade caulking.

Electrical:

- Install exterior lighting with photocell control.

1.4.7 Carpenter Building Findings

No work is contemplated other than addition of an attic hatch and door and frame and hardware upgrades.

1.4.8 Carpenter Building Recommendations

Near term recommendations that should be planned to be undertaken within the next two years have been put forward for architectural, mechanical, and electrical and are summarized as follows.

Architectural:

- Repair and paint door and frame, replace sill.
- Provide attic hatch.

Mechanical:

- Based on the intended use of this building it should be provided with a ventilation system.

Electrical:

- Install photocell controlled building exterior lighting.
- Install one dual head emergency battery unit in the building.

Mid-term recommendations that should be planned to be done in the next 3-10 years are architectural and electrical and are summarized as follows.

Architectural:

- Replace door.
- Replace roof shingles.

Electrical:

- Install new main disconnect and main load center with sufficient spare capacity.
- Replace baseboard heaters.
- Replace all old receptacles and lighting switches, including the outlet boxes and faceplates.

CHAPTER 2 FACILITY AUDITS

2.1 Main Depot Building

2.1.1 Architectural Assessment

This 800 square meter pre-engineered metal building was originally constructed circa 1974 with a 12 meter extension having been added to the warehouse many years later. The building consists of two on grade levels on concrete foundations and slabs on grade. The building houses offices, training room, staff lunch rooms, washrooms, warehouse and various individual workshop units. The building is in good condition but the envelope is showing its age and upgrades should be considered in the next 3-5 years. Some codes upgrading is also required.

2.1.1.1 Building Exterior Envelope

The building envelope is of pre-engineered steel frame, with vertical painted metal cladding, aluminum operable and fixed windows, hollow metal and aluminum doors, fibreglass and insulated metal overhead doors and low slope metal roofing. Siding is exhibiting corrosion at the sills due to proximity of grade and splash back from roof drainage. Paint is faded and peeled. Replacement of the siding is recommended within the next 2-3 years, addition of full roof gutter and downspout system is also recommended to be carried out within one year. Personnel doors are in good condition with painting recommended. Windows are aluminum. Insulated metal overhead doors are contemporary and in good condition, remaining are single lite fibreglass panel overhead doors while in fair to good condition are thermally poor performers, replacement should be considered in the next 1-3 years. The metal roofing has had a coating applied in the general area where the 'L' shaped building wings intersect. The roofing appears to be at or close to the end of its useful life with replacement to be considered in the next 3-5 years. The exterior walls are clad with clay face brick along part of the front façade. While the brick is in good condition some pointing is required. No brick vents were noted at the top but weep holes were noted along the sill.

2.1.1.2 Building Interior

Offices block (original construction):

Floors are concrete slabs on grade with 300 x 300 mm vinyl tile and rubber base finish which is in good condition but would benefit from washing and waxing. The training room has a carpet floor finish. The main entrance vestibule floor is of non-glazed ceramic tile. Interior finish of exterior walls

as well as partitions is of painted drywall. Studs are metal with the exception of the training room which has a sound insulated wood stud partition. Ceilings are 610 mm x 1220 mm un-rated suspended acoustical tile. Aged water stains are present along several locations close to the front exterior wall. Staff advised that recent roof leaks were repaired, stained tiles should be replaced. Doors are generally solid core wood in pressed steel frames with commercial hardware, these are in good condition.

Shops/offices block (original construction):

Both the original construction and extension shops/offices and warehouse are located one half level below the offices block to follow the site's natural grade. Poured concrete stairs access between the two levels. This block houses three offices, one washroom, a staff lunch room, small storage room and three individual trade shops. Floors are concrete slabs on grade with painted finish in the shops and 300 x 300 mm vinyl tile elsewhere. Shops partitions are of painted concrete masonry block with metal stud and painted drywall elsewhere. Personnel doors are hollow metal in pressed steel frames to the shops and solid core wood in pressed steel frames elsewhere. All are painted. No fire rating labels were noted. Ceilings in the offices, washroom and lunch room are 610 x 1220 mm non rated suspended acoustical tile. Aged water stains are evident, such tile should be replaced. The closest shop to the office block has had a plywood and wood stud framed storage room constructed within it with an open storage mezzanine above it accessed by a fixed ladder.

Warehouse (addition):

A pre-engineered steel warehouse was added to the original shops wing. The 12.2 metre long extension matches the original building in depth and height. Exterior walls are pre painted vertical metal siding, roll glass fibre vinyl coated insulation and interior of exterior walls are finished part height with pre painted steel liner panel. The roof consists of a low slope standing seam steel roof with roll type glass fibre vinyl coated insulation exposed to the building interior. The overhead door is contemporary insulated pre painted steel which is in good condition. The extension is overall in good condition.

The extension includes wood stud/joist/plywood constructed storage mezzanines which have low ceiling and are a combination of open space and plywood shelving. Similar rooms exist on the first floor. The mezzanines are accessed via open wood stairs.

2.1.1.3 Building Code

The building is classified as F-3 – Low Hazard Industrial and "D" Offices by the NBCC 2010.

2.1.1.4 Accessibility

The building is not currently accessible to persons with disabilities. Given its age it would not be required to be accessible unless renovations from 1981 to now, plus additional renovations were to take place which exceeded 50% of the replacement cost of the building. The estimated replacement value of the building is $2,016,000. If it was desired the building could be made 'reasonably accessible' by adding a power door operator, accessible washroom and lift on the stair between the office block and warehouse/shop block. To change doors and door clearances would be a major project. Such modifications could allow mobility challenged visitors and office staff to use the building.

2.1.1.5 SELECTED NBCC 2010/ LSC 101 REQUIREMENTS

The following provides an overview of several National Building Code/Life Safety Code NFPA 101 requirements and applicable sections for this facility.

Requirements	**Compliance / Action**
1) Building Occupancy Group F-3 – Low Hazard Industrial Group D – Business and Person Services – Office Areas *NBCC A-3.1.3.1*	Compliant
2) Group D, Up To Two Storeys 1. A building classified as Group D, is permitted to conform to Sentence (2) provided a. It is not more than 2 storeys in building height, and b. It has a building area not more than 1500 m^2 when facing 3 streets. 2. The building referred to in Sentence (1) is permitted to be of combustible construction or non-combustible construction used singly or in combination, and a. Floor assemblies shall be fire separations and, if of combustible construction, shall have a fire resistance rating not less than 45 minutes, and i) Have a fire resistance rating not less than 45 minutes, and ii) be of combustible construction. *NBCC 3.2.2.50*	Multiple Occupancy Group D – Offices Group F-3 – Low Hazard Industrial Group D is the most restrictive, therefore governs. Compliant
3) Occupant Load (Based on LSC) Group F3 - Low Hazard Industrial: 450 m^2/46 m^2 per person = 9.8 Group D – Offices: 247 m^2/9.3 m^2 per person = 26.5 Total Occupant Load = 36 persons (Service rooms, storage, circulation and washrooms are excluded)	Compliant
4) Exit Capacity The maximum size of rooms or suites with one exit are as follows: Group D – 200 m^2 with a 25 metre travel distance to the egress door. Group F-3 – 200 m^2 with a 15 metre travel distance to the egress door. *NBCC 3.4.2.1.A*	Suites are compliant
5) Except if exits are located along the perimeter of the floor area and each main aisle in the floor area leads directly to an exit, the travel distance may be 60 metres maximum. NBCC 3.4.2.5	Compliant
6) The minimum width of a public corridor shall be 1100 mm. *NBCC 3.3.1.9*	Compliant
7) Travel Distance shall be maximum of 30 metres. *NBCC 3.4.2.5*	Non-compliant Certain corridor (access to

Requirements	Compliance / Action
	exit) travel distances exceed 30 m and are dead ended. Exits to be added.
8) Exit capacity 36 persons x 6.1 mm per person = 220 mm *NBCC 3.4.3.2*	Compliant (with the exception of dead ending and travel distances).
9) Exits shall be separated from the remainder of the building by a fire separation having a fire resistance rating of not less than 45 minutes. *NBCC 3.4.4.1*	N/A
10) Electrical rooms, if housing transformers, shall have a fire resistance rating of not less than 60 minutes. *NBCC 3.6.2.1*	Compliant
11) Washroom Fixture Calculation Group F-3 - 9.8 persons: 1 washroom Group D - 26 persons: 1 male, 1 female *NBCC 3.7.2.2*	Compliant
12) The building need not be designed to meet the NL Accessibility Act requirements due to its age.	
13) In a building with more than one major occupancy, the requirement of the most stringent occupancy shall apply to the entire building.	Group D governs
14) Cooking equipment not within dwelling units used in processes producing grease laden vapours shall be designed and constructed in accordance with Part 6.	Non-compliant, however commercial hood with fire suppression system as required in Part 6 would not be required for this application. A standard residential hood is acceptable.
15) Rooms for storage of janitorial supplies shall be constructed with a 45 minute fire rated fire separation. *NBCC 3.3.21.2*	Non-compliant Labelled door and frame and walls and ceilings with required rating to be constructed.
16) Limiting distance	Compliant

2.1.1.6 Conclusions and Recommendations

The building is in generally good condition with minor maintenance and codes upgrading required.

The following short term recommendations are made:

- Replace stained ceiling tiles.
- Repoint brick.
- Provide non-skid treads c/w tactile to corridor stairs.

- Correct code exiting by addition of an exit from "plan" west of Corridor 17 (refer to floorplan in Appendix G) to eliminate dead ending and travel distance overage as well as fire ratings deficiencies.
- Add gutter and downspout systems.
- Paint doors and frames.
- Provide correct code to code guards and stair rails in shops and warehouse.

The following mid- term recommendations are made:

- Replace metal siding.
- Replace remaining fibreglass overhead doors.
- Paint interior of building.
- Replace metal roofing.

2.1.2 Structural Assessment

The main depot building at the Whitbourne Eastern Area Depot is a pre-engineered steel building supported on a concrete foundation wall. The building can be split up into the office area, the work shop/ warehouse area and the newer extension. The extension a pre-engineered steel structure which ties into the warehouse area.

2.1.2.1 Foundation and Floor Systems

The main building structures are supported on a concrete foundation wall. Since the office building portion is located on higher grade the foundation wall that is shared between the warehouse and office also acts as a retaining wall.

The foundations of the main building range from poor to good condition. Typically with foundation walls it is recommended to have a minimum of 150mm (6") to 200 mm (8") of the foundation wall above grade. It appears as though most of the building's foundation wall does not protrude above grade the minimum 150 mm (6") meaning that the top edges of the concrete wall will be in more frequent contact with rain or snow. The constant water contact and repeated freeze thaw cycles can result in damage to the concrete as well as to the metal cladding.

The warehouse foundation appears to be in good condition as there were no large defects noted other than vertical shrinkage cracks on the concrete retaining wall. Although there is no significant damage noted on the warehouse foundation, there are concerns of possible future damage to the backside foundation wall due to the grading of site sloping towards the foundation wall (see Structural photo 1). Water from rainfall or snow fall will then migrate towards the foundation wall due to this slope. Given that the top of the foundation wall is assumed to be close to the grade (cladding conceals top of wall) contact with water and repeated freeze thaw cycles could result in damage.

The foundation wall supporting the office building area is in poor condition. The portion of the foundation along the front face of the building and to the right of the main entrance is cracked horizontally resulting in large areas of spalled concrete (see Structural photos 2 and 3). The same damage is evident on the face of the foundation wall facing the Maintenance Garage (see Structural

photo 4). It is suspected that this damage has been caused by water infiltration and repeated freeze thaw cycles. Given the proximity of the top of wall to grade level, the top edge of the foundation wall would be in contact with water or snow more frequently possibly accelerating the damage. It appears that the metal cladding below the windows have been replaced in the area in which the damage was noted. It is not known whether this cladding has been replaced due to water issues or due to another issue.

The inspection of the foundation walls was limited as only a small portion of the wall could be viewed from the exterior.

The interior ground floor of both the warehouse and office building consists of concrete slab on grade. The office portions slab was concealed by floor tile, and therefore could not be inspected. The concrete slabs that were visible appear to be in fair condition. Cracking was noted at various areas however this cracking appears to be caused by shrinkage during curing as there are no patterns to the cracking that would suggest otherwise (see Structural photos 5 and 6). Although it is suspected that these cracks are caused by shrinkage, the definite cause of cracking is not known. Regardless of the cause, the noted cracks will not affect the performance or strength of the slab.

2.1.2.2 Roof Systems

The roofing system of the main building consists of metal cladding and insulation supported on cold formed steel purlins which in turn are supported by the main building frames. The inspection of the roof system of the main building was limited as not every component was visible for inspection. The warehouse areas allowed easy access to view the purlins and building frames, however the locations where drop down ceilings are installed proved more challenging as mechanical and electrical components concealed portions of the roof system.

Overall the roof system from a structural stand point appears to be in good condition. Throughout the inspection of the front office portion of the building, water damage was noted on some of the drop down ceiling tiles. Although water damage was viewed on the ceiling tiles the water did not affect the main structural members supporting the roof. Within the warehouse portion of the building there were a couple of locations in which purlins were noted as being deformed (see Structural photo 7). The deformations in the purlins do not appear to have been caused by overstressing. Typically when a purlin or beam is overstressed due to bending the top compression flange will show signs of buckling. The deformations noted occur on the bottom tension flange which suggest that the damage was caused by abrasion during construction or everyday operations.

2.1.2.3 Framing Systems

Pre-engineered buildings consist of a series of rigid building frames in the transverse direction tied together by way of purlins, wind girts and horizontal and vertical steel bracing. The entire framing system could not be viewed as interior liner panel and wall finishes in both new addition and office building concealed the exterior column flange and wind girts.

The steel framing appears to be in good condition as there were no signs of deformations or damage to any of the visible building frames or bracing member. Minor surface corrosion was noted on the

bolts and base plates of the columns however the corrosion is not of concern. During the inspection the location of the wind girt within the warehouse section seemed rather large resulting in the interior and exterior panels spanning a long distance. On closer inspection the interior panel is cut where it meets the wind girt (see Structural photo 8). Therefore it is assumed that additional members such as steel or timber studs must be framed from the ground floor to underside of girt in order to take the wind loading of the panel given as there does not appear to be damage to the panels. The existing drawings that were provided did not include a detail for the wall construction.

It was also noted during the inspection of the building frame within the new extension that tools are being hung from the horizontal steel tie rod (see photo 9). Although hanging the tools does not affect the condition of the tie rod, it may affect the loading. Any additional weight put onto the tie rod will result in increased tension loads being transferred into the member. The increased loading is not desirable as the tie rod system is typically designed to be near maximum capacity.

2.1.2.4 Mezzanines and second floor framing

Within the back two bays of the building (new addition) a timber framed second level was constructed. The timber floor is constructed of 38 x 235 (2x10) timber joist spaced at 400 mm (16”), supported by a 3 ply 38mm x 235 mm (2x10) built-up timber beam which spans a maximum of 3.0 m (10’0”). Steel jack posts which bear on ground level concrete slab on grade provide support to the main supporting beam (see Structural photo 10). The floor system is finished with painted plywood sheathing.

The timber floor systems of the addition appear to be in good condition. The floor appears to be built using proper construction methods and no signs of excessive deflections are visible. While walking on the upper floor levels there is no excessive vibration or “bouncing” of the floor joists indicating sufficient strength. Also, the main supporting beam appears to be adequately connected to the steel jack post.

The telecontrol and protection shop of the warehouse portion is also equipped with a small mezzanine supported constructed on top of a storage room (see Structural photo 11). The framing of the mezzanine was not visible at the time of inspection however it is assumed to be in good condition as there were no signs of cracking in the ceiling finishes below. Cracking in the ceiling finishes would suggest excessive deflections, which could mean overstressing.

2.1.2.5 Concrete block partition walls

Concrete block partition walls are in fair condition. The block walls extend from concrete slab on grade to the underside of roof framing elevation. Cracking diagonally along the grout line was noted, which is an indication of settlement (see Structural photos 12 and 13). The settlement could have occurred shortly after construction of the wall such as initial settlement of placed gravels, or could have happened over time. Although the cracking indicates settlement of the wall, there is no need for immediate concern, rather the walls with this cracking evident should be monitored to ensure the condition does not worsen.

2.1.2.6 Conclusions and Recommendations

Overall the main building is in good condition with the exception of the damage to the foundation wall. Based on the observations made during the inspection the following is recommended.

- Foundation wall should be exposed in locations where larger horizontal cracks and spalling is noted. The visual inspection was limited as only a small portion of the wall was visible. This makes it difficult to determine the cause of the damage noted on the foundation wall. It is recommended to remove cladding and carry out required excavation in the location of the damage to uncover full extent of the damage. Once the full damage of the crack is determined an appropriate repair detail can be recommended.
- All tools must be removed from horizontal cross bracing. As discussed in section 2.1.3.3, any additional weight imposed onto the steel tie rod will result in an increased tension load significantly. Relatively small transverse loads applied to tension members such as tie rods can impart a significantly tension force to the member. Pre-engineered building components are typically designed to their maximum theoretical capacity, therefore additional weight could theoretically overstress the member.
- Cracks in concrete block partition walls possibly caused by settlement should be monitored to ensure condition does not worsen.

2.1.3 Mechanical Assessment

2.1.3.1 Plumbing – Drainage, Waste, and Venting

The office/warehouse facility is equipped with a number of washrooms and lunchrooms throughout the facility. The office area is provided with one male washroom, one female washroom, and a small lunchroom. The warehouse level is provided with one washroom, laundry area, and lunchroom.

Waste and vent piping in the building is primarily ABS (see Mechanical photos 1 to 3). ABS piping cannot be used in ceiling spaces used as return air plenums and where passing through fire separations must be provided with fire stop collars. No instances of these issues were directly observed however they potentially exist due to the presence of this type of pipe and that the office space utilizes the ceiling space as a return air plenum.

Condensate drains from indoor HVAC equipment was observed to be copper.

Based on the original building drawings, the three workshops were provided with floor drains connected to an oil interceptor system. The oil Interceptor system was indicated to be composed of a stabilizing chamber, oil interceptor, and underground oil storage tank. Discharge from the system was indicated to be piped to a drainage ditch. On site it was observed that all three shop floor drains have been capped rendering the system nonfunctional (See Mechanical photo 4). Access to the stabilizing chamber (located in the Transmission Shop) and the oil interceptor (located in the Warehouse) were not possible due to racking and storage cabinets placed on top of the floor access covers (see Mechanical Photos 5 and 6). There was no observable evidence of the presence of the underground oil storage tank.

The original building drawings indicate that sanitary sewage from the facility flows to a septic system located on the eastern end of the facility. There were no observable or accessible components of this system.

2.1.3.2 Plumbing – Domestic Water Piping and Systems

Domestic water for the facility is provided from an onsite well. Based on original building drawings the buried well is located in the yard area south of the workshops. No observable signs of the well were present during the site visit. Well water enters the building in the Communications Shop to a 72 L diaphragm type pressure tank fitted with a pressure switch. The well pump control is fitted with a pump protection module. Water from this tank is piped to a polyethylene storage tank that is provided with level controls which operates a motorized ball valve to open when water level in the tank falls below a set level. Water from the storage tank enters a Berkeley Model 7HN ¾ HP centrifugal pump mounted on the floor that is controlled with a pressure switch and water is stored under pressure in a second 132 L diaphragm type pressure tank. See Mechanical photos 7 to 9. An inline cartridge type filter provides filtration. There was no presence of a water disinfection system. The water supply system is fully functional with no issues being reported.

With the exception of the water entrance pumping and storage system the domestic water piping is copper throughout the facility. Domestic water piping is generally insulated with preformed pipe insulation and canvas jacketing. Some areas of the piping are not insulated (see Mechanical photo 10).

Domestic water piping throughout the building is generally 42 years of age and is at the end of its expected life.

Isolation valves are typically gate valves in older piping and ball valves in newer piping,

Domestic hot water is produced in an electric hot water tank located in a storage room in the Office area Lunch Room. The tank is a Giant model 152ETE-3F5M, 175 L, 3kW, that was manufactured in 2004 (see Mechanical photo 11). This tank is at the end of its useful life.

Measured hot water temperature was 55.6°C which is satisfactory.

Water quality in the building appeared to be relatively good, however it would not be suitable for consumption without a means of disinfection. The Office Area Lunch Room sink is provided with a Purelux UV filtration system with dispensing faucet. The unit was not plugged in so the UV system is not functional. If the system is to be re-instated it should be provided with signage to indicating that water from the system is not potable and must be boiled prior to consumption.

2.1.3.3 Plumbing – Fixtures

As mentioned previously the facility has a number of washrooms, lunch rooms, and other areas with plumbing fixtures. Water closets are a combination of commercial grade and residential grade floor mounted tank type utilizing 13 L or 6 L per flush (see Mechanical photo 13). Water closets were

generally in good condition. The water closet in the shop/warehouse area washroom was observed to have its seat cover off (see Mechanical photo 13).

Urinals are wall hung commercial grade vitreous china with manual flush valves (see Mechanical photo 14). The urinals were in good conditions with no issues noted.

Washroom lavatories were a combination of countertop residential grade and commercial grade wall hung (see Mechanical photos 15 and 16). Lavatory faucets were residential grade. Lavatories were in good condition with no issues noted.

Lunch Room sinks were single bowl stainless steel (see Mechanical photo 17). Sink faucets are residential grade two handle type. Sinks were in good condition with no issues noted.

A self-contained wall mounted eyewash unit is provided in the warehouse extension (see Mechanical photo 18). The unit is inspected and maintained on a regular basis.

2.1.3.4 HVAC – Air Handling Systems

The facility is provided with minimal air handling systems. The office area is provided with a built up system with cooling and humidification as described below. Exhaust fans are present in washrooms and lunch rooms.

The main office area is provided with a split air conditioning system. The condenser is located outdoors on the north end of the office area and the evaporator is an indoor air handler unit located in the ceiling of the office area main corridor. The condenser is a Carrier model 38TRA060 and has a nominal cooling capacity of 5 tons (see Mechanical photo 19). The indoor air handler unit is a Carrier model 42BHC20 (see Mechanical photo 20). The units were manufactured in 2005 and utilize R22 refrigerant. This system is provided with supply ducting throughout this office area. A return air fan located above the Lunch Room ceiling takes air from the ceiling plenum and returns a portion to the indoor unit and expels a portion to the outside through an exhaust hood. The return air fan is a Carnes model VIBK15R1C1NL20S. Supply ducting, return air ducting, outside air ducting, and exhaust air ducting is insulated with foil faced blanket type insulation. At 11 years of age this system should have 5 to 10 years life remaining.

Downstream of the indoor air handler is an electric duct heater which tempers the air in non-cooling mode when required. The duct heater is a Thermolec model SC-CTPBX with 26 kW capacity. The discharge temperature of the duct heater is controlled by a duct temperature sensor and thermostat located in the janitor room.

Air distribution is through bypass type terminal units and square cone diffusers and return air grilles into the ceiling cavity (see Mechanical photo 21). The air distribution system appeared to be in good condition. The terminal units are controlled by zone thermostats which control the airflow to the space to maintain space temperature and also control the space baseboard heat.

A master controller is located in the janitor room which turns the systems fans on and off, controls the outdoor condenser cooling stage, and enables/disables the duct heater operation (see Mechanical photo 22). It was observed on site that the system did not operate continuously but cut in and cut out possibly to the fan control in the controller not being set to occupied continuous operation. As this system also provides ventilation air to this part of the building this system should operate continuously during occupied periods.

The system is provided with an electric steam humidification system to maintain proper humidity levels in winter conditions. The humidifier was manufactured by DriSteam (see Mechanical photo 23). Its model and capacity were not able to be verified. Based on the age of this unit it should have a remaining expected lifespan of 10 to 15 years. Steam from the unit is injected into the supply air ductwork downstream of the indoor air handling unit. Humidifier output is controlled by a humidity sensor located in the return air ductwork. Regular inspection and maintenance should be performed on this unit.

It was observed that the Electrical Room which houses the network equipment is not serviced by this system and there is no other means of cooling this space which appeared to be a higher temperature than would normally be desired. A dedicated cooling system for this space should be considered.

Lunch Rooms are provided with domestic style range hoods ducted to the outside (see Mechanical photo 24). It was observed that the warehouse/workshop area Lunch Room range hood was not working.

Washrooms are provided with ceiling mounted exhaust fans ducted to the outside (see Mechanical photo 25).

2.1.3.5 HVAC – Ventilation Air

The office area built up air handling system is configured to provide ventilation air. When the system is running a quantity of outside air taken in through a hood mixes with return air and is distributed throughout the office area. Excess return air is exhausted to the outside from a hood (see Mechanical photo 19 for intake and exhaust air hoods). Based on the ventilation upgrading drawings provided, the amount of outside ventilation air being bought into this space (427 L/s) is excessive based on ASHRAE standards. This excess outside air results in greater cooling and heating costs to the facility. Proper ventilation air should be calculated and this part of the system rebalanced.

The remainder of the building has no means of proving ventilation air in accordance with ASHRAE 62.1. There is no source of makeup air for the other various exhaust systems other than what would come in around doors, windows or other poorly sealed parts of the building. It is recommended that a heat recovery system be installed to provide ventilation air to spaces in accordance with ASHRAE.

Use of heat recovery ventilator is recommended for energy savings. The existing washroom and lunchroom exhaust fans could be removed and washroom and lunch room exhaust ducted to the new heat recovery unit. The heat recovery unit would service the warehouse, shops, and associated offices. The new system would be provided with an outside air intake, exhaust air discharge, supply air electric tempering coil, associated controls, and distribution ductwork and grilles. The unit could be installed on an existing mezzanine level in the warehouse extension or communications shop. Ductwork would be run above the existing shop office area and high in the existing warehouse and shop areas.

2.1.3.6 HVAC – Controls

The office area air handling system is provided with a master control unit (Viconics T7652A1000) located in the janitor room as per part 2.1.3.4 (see Mechanical photo 22). System zone bypass terminal units and perimeter heat as described in part 2.1.3.4 are controlled by non-networked thermostats (see Mechanical photo 26). Refer to section 2.1.3.4 for a more detailed description of these controls.

Washroom and other miscellaneous fans are controlled by simple toggle switches.

2.1.3.7 Fire Protection

No sprinkler system is present in the building.

The building is provided with portable fire extinguishers throughout. The majority of the extinguishers are dry chemical type suitable for class A, B, and C fires. All extinguishers had up to date inspections. There appeared to be sufficient fire extinguishers for the hazard classification of the building.

2.1.3.8 Conclusions and Recommendations

The following recommendations are made for mechanical improvements to the depot building.

Plumbing:

- Replace any ABS piping present in the office area return air plenum with copper or plenum rated plastic DWV.
- Replace domestic hot water tank.
- Provide insulation on uninsulated domestic water piping.
- In the mid-term replace copper domestic water piping throughout facility.

HVAC:

- Verify office area control operation and set up for continuous operation during occupied periods.
- Inspect and service office area steam humidifier.
- Provide a dedicated cooling system for the Electrical/Server Room.
- Replace the warehouse/workshop area Lunch Room range hood.
- Rebalance outside air rates to office area.
- Provide heat recovery ventilation system to provide minimum outside air to warehouse/shop area of building.

2.1.4 Electrical Assessment

2.1.4.1 Service and Distribution

2.1.4.1.1 Description

The electrical service enters the main building overhead from three (3) pole mounted single phase distribution transformers (refer to Electrical photo 1).

The main incoming service conductors to the building are connected to a 600A, 120/208V disconnect switch. The main disconnect feeds main splitter which feeds two (2) other splitters, one (1) 225A for lighting and general loads and one (1) 400A for heating loads.

Revenue metering is performed at both secondary splitters with separate revenue meters, one (1) meter for lighting and general loads and one (1) meter for heating loads. The main disconnect, the splitters with associated disconnects and revenue meters are located inside the main building electrical/telecommunication room (refer to Electrical photo 2).

120/208V electricity is distributed through the facility is distributed through four (4) distribution panelboards (Refer to Electrical photos 3 and 4) as follows:

- Heating Panel HPA – Main Office
- Heating Panel HPB – Lower Corridor
- Lighting Panel LPA – Main Office
- Lighting Panel LPB – Lower Corridor

2.1.4.1.2 Observations

The incoming 600A at 120/208V service capacity appears to be adequate based on the peak demand history over the past 3 years.

Most of the power distribution equipment in main electrical room appears to be more than thirty (30) years old and is in fair physical condition. There were no visible signs of excessive wear or corrosion. Cabling/conduit runs also appeared to be in good condition with no apparent deficiencies.

Panelboards are recessed mounted in the office area and in the corridor space and feed all building lighting, heating and receptacle loads. Panels seem to be original installed more than thirty (30) years ago and are in poor condition. There is no spare capacity on most of the panelboards. There are five (5) circuit breaker spaces available only at one of the heating panelboards.

2.1.4.1.3 Conclusions

Based on the visual inspection of the facility, all four distribution panelboards have exceeded their service life expectancy. New panelboards with sufficient spare capacity have to be installed in the next five (5) years.

2.1.4.2 Emergency Power System

There is no emergency power distribution system.

2.1.4.3 LIGHTING

2.1.4.3.1 DESCRIPTION

The majority of the office areas are illuminated by 4 ft. recessed acrylic lens florescent fixtures with T8 Lamps (Refer to Electrical photo 5).

Some service and storage rooms are lit with 4 ft. surface mounted 2–lamp, T8 linear wraparound or strip fluorescent fixtures.

The warehouse area is primarily illuminated by stem-mounted lensed fluorescent fixtures (Refer to Electrical photo 6).

The exterior building lighting is provided by HID wallpacks installed above the overhead doors and man doors (Refer to Electrical photo 7) and wall by mounted HID fixtures.

The building lighting is fed from the 120/208V panelboards. The exterior lighting is partially operated through a lighting contactor located in the main electrical/telecommunication room. The lighting fixtures above man doors have individual control and some were observed to be switched on during day time.

2.1.4.3.2 OBSERVATIONS

Office areas, corridors and warehouses were observed to have adequate lighting levels as required by the latest edition of the NBCC.

The lighting fixture in the office area, corridors and warehouses are in good condition.

The exterior fixtures with exception of the fixtures above man door are in poor condition.

2.1.4.3.3 CONCLUSIONS

The old exterior lights and associated controls should be replaced.

2.1.4.4 EXIT AND EMERGENCY LIGHTING

2.1.4.4.1 DESCRIPTION

The building emergency lighting consists of dual head emergency battery units. In some locations the battery unit is combined with exit sign. Most of the battery units are new and in good condition.

The building is equipped with lighted exit signs located throughout. They have battery backup and are lit with incandescent lamps. Refer to Electrical photo 8 for emergency and exit lighting.

2.1.4.4.2 OBSERVATIONS

Emergency lighting units and exit signs are adequate and most of them are in good condition.

2.1.4.4.3 CONCLUSIONS

Provide 30-second monthly functional test. Consider battery replacement for 10 year old lead acid units or for 15 year old nickel cadmium units.

2.1.4.5 HEATING SYSTEM

2.1.4.5.1 DESCRIPTION

The whole building is heated by electrical heaters. The office area is heated by electric baseboard, wall mount convection and wall mount forced air heaters (Refer to Electrical photo 9). The warehouses are heated by vertical discharge electric unit heaters (Refer to Electrical photo 6).

2.1.4.5.2 OBSERVATIONS

The electric heater in office area and warehouses area are in relatively good condition. It was observed that a baseboard heater in the space off of the warehouse was not operational and that one of the warehouse unit heaters was noisy.

2.1.4.5.3 CONCLUSIONS

Investigate and repair baseboard heater in space off of warehouse area. No heater replacement will be required in the next 10 years.

2.1.4.6 WIRING DEVICES

2.1.4.6.1 DESCRIPTION

U-grounded, duplex receptacles are installed throughout the building. Receptacles are recessed with the exception of the receptacles installed in the warehouse and other shop spaces, which are surface mounted. The receptacles in wet areas are GFCI. The outdoor receptacles are weather protected type duplex receptacles.

The lighting control in offices, service rooms and warehouses is provided by individual lighting switches for each circuit.

2.1.4.6.2 OBSERVATIONS

The indoor receptacles and lighting switches are sufficient quantity and in good condition. All outdoor receptacles are in poor condition (refer to Electrical photo 10).

2.1.4.6.3 CONCLUSIONS

All outdoor receptacles, including the outlet boxes and the weather protective covers need replacement.

2.1.4.7 WIRING METHODS

2.1.4.7.1 DESCRIPTION

Wiring system appears to be a combination of AC-90 and NMD90 cabling installed concealed in walls and above ceiling in the office area and TW or RW90 cabling installed in EMT conduit in warehouses.

2.1.4.7.2 OBSERVATIONS

The observed wiring appears to be in good condition.

2.1.4.8 Fire Alarm

2.1.4.8.1 Description

The Fire Alarm panel is a GE EST FireShield System with 3-zone conventional fire alarm control (Refer to Electrical photo 11).

2.1.4.8.2 Observations

The fire alarm panel appears to have been replaced and is not more than 10 years old. Wiring is concealed and not visible.

Smoke detectors, pull stations and fire alarm bells are installed throughout the building. Smoke detectors are relatively new. Pull stations and alarm bells are original. All fire alarm devices are in good condition.

No visual signal alarms were apparent throughout the building.

The fire alarm system annunciator/control panel is located in the office area and is not visible from the main entrance.

2.1.4.8.3 Conclusions

We recommend the installation of visual alarms for aiding any potential hearing impaired occupants.

Consider relocation of the fire alarm annunciator/control panel next to the main entrance as required by NBCC, Clause 3.2.4.9.

2.1.4.9 Data and Communications

The building telecommunication cables enters the building in the main electrical/telecommunication room. All telecom equipment including but not limited to telephone BIX blocks, telecom racks, patch panels, Ethernet switches, etc. and cabling is not more than 10 years old and is in good condition (Refer to Electrical photo 12).

2.1.4.10 CCTV / Security System

2.1.4.10.1 Description

There is a proximity card access control system that controls access to some building areas during after hours. The card access system is relatively new and in good condition (refer to Electrical Photo 13). There is no CCTV system.

2.1.4.11 PA System

There is public address (PA) system in the building controlled from the front desk. The loudspeakers are recessed in the ceiling tiles inside the office area and surface mounted in the warehouse area and the storage area adjacent to the building. The loudspeakers are new good condition.

2.1.5 Environmental Review

2.1.5.1 Air Emissions

No air emissions are present from the facility from fuel burning equipment or processes using chemicals.

2.1.5.2 Asbestos Containing Materials

An asbestos survey provided to the consultant indicated the presence of asbestos in floor tile and in drywall joint filler. The presence of these asbestos containing materials shall be made aware to any personnel undertaking work in the facility that could disturb these materials.

2.1.5.3 Lead Containing Materials

Lead is likely present in plumbing solder and possibly in oil based paints used in the facility. The potential presence of lead containing materials shall be made aware to any personnel undertaking work in the facility that could disturb these materials.

2.1.5.4 PCB Containing Materials

Fluorescent lighting in the facility is not old enough to be of concern for presence of PCB's that were commonly used in older lighting ballasts.

2.1.5.5 Ozone Depleting Substances

The office air conditioning system utilizes the recognized ozone depleting refrigerants R22. Older refrigerators may also contain ozone depleting refrigerants. Ozone depleting refrigerants must be recovered and properly documented prior to equipment being disposed of.

There was no Halon fire extinguishing systems identified in the facility.

2.1.5.6 Indoor Air Quality

While no indoor air quality issues were noticed while on site, a substantial portion of the facility is not provided with proper ventilation and make-up air systems. Any odours, VOC's from off gassing, and other airborne pollutants cannot be effectively removed from the building.

2.1.5.7 Mould and Mildew

No signs of mould or mildew were present throughout the building.

2.1.5.8 Spills and Contaminated Areas

Signs of spills were observed both inside the main depot building and around the site based on stains (see Environmental Photos 1 to 3). The spill inside the building was observed in the extension off of the warehouse area underneath a mobile transfer pump. Stains in the depot yard were found to the south of the main building.

2.1.5.9 Flammable and Combustible Liquids Storage

Flammable and combustible liquids were found to be present in the Warehouse and Warehouse extension (see Environmental Photos 4 to 17).

Liquids found in safety cabinets in the Warehouse included:

- Aerosol spray paints;
- Aerosol spray primers;
- Aerosol spray cleaners;
- Aerosol spray lubricants;
- Penetrating lubricants;
- Paint thinner;
- Acetone;
- Insulator cleaner and protector.

Liquids found in safety cabinets in the Warehouse Extension included:

- Penetrating oil;
- Gasoline;
- Hydraulic fluid;
- Transmission oil.

Miscellaneous liquids found in the Warehouse Extension but not in safety cabinets included:

- Compressor oil;
- Degreaser;
- Gasoline and oils in various combustion engine powered equipment such as chainsaws, brush cutters, pumps, snow blower, etc.

Liquids found outdoors at the south corner of the site included numerous 205 L drums of transformer oil. A ramp located on the east end of the building contained 205 L drums of jet fuel.

Quantities present do not exceed maximum amounts allowable for incidental use.

2.1.5.10 Compressed Gases Storage

Quantities of compressed gases were observed within the building and in the depot yard (see Environmental Photos 18 to 23). Items found inside the building included:

- Propane cylinders stored in safety cabinet;
- Propane cylinder in BBQ located in warehouse extension (two such);
- Nitrogen cylinder;
- Sulfur hexafluoride cylinder.

The National Fire Code of Canada prohibits the indoor storage of Class 2.1 flammable gases of which propane is one unless the storage is in a specially designed room and not within a specified distance of other flammable and combustible liquids.

Gases stored outside in the yard include:

- Sulfur hexafluoride;
- Propane cylinder (used on forklift).

2.1.5.11 Conclusions and Recommendations

The following recommendations are made regarding environmental issues identified.

- Indoor air quality should be addressed as per the recommendation in the mechanical section of this report.
- The presence of asbestos and potentially lead containing materials are to be made aware to anyone undertaking work that may disturb these materials.
- Ozone depleting substances (refrigerants) should be properly recovered prior to disposing of equipment.
- Stained soil in the depot yard should be removed and properly disposed of. Stains on interior floors should be cleaned.
- Stored propane cylinders should be moved to an outdoor storage area.

2.1.6 Energy Usage Review

Knowing the energy consumption of a facility from all sources (electricity, petroleum fuels, etc.) an energy use intensity (EUI) can be calculated which can be compared to benchmark EUI's for various types of buildings in Canada. These benchmarks represent median EUIs for various types of facilities. Energy usage information was provided for the years 2014 to 2015 for this site. Based on the building area and the energy consumption the EUI was calculated for each of these years to be 0.64 and 0.59 respectively.

Based on the EUI tables for various building uses, the median Site EUI for a mixed use building is 0.90. Based on this the building is more energy efficient than the national median value. However as the building is not provided with a proper ventilation system its calculated EUI is less than would be expected. It would be expected that with the addition of a proper ventilation systems this building EUI would increase to around the national median value.

2.2 Maintenance Garage

2.2.1 Architectural Assessment

This vehicle repair building has a 133 square metre footprint/first floor area plus a small 18.4 square meter second floor. The age of the building is unknown but it is not contemporary. The building houses a repair garage with an in floor repair pit and equipment workspace. A single washroom/laundry and a storage room complete the first floor. The second floor, accessed via open wood stairs houses an office plus a compressor/storage room. The building is of wood frame with sloped roof clad in asphalt shingles. Siding consists of vertical pre-painted metal which is in several colours and is significantly faded. Exterior doors include one hollow metal personnel door in a pressed steel frame, which requires re-painting. One large pre-painted insulated steel overhead door provides vehicle access. The building is in fair condition with significant upgrading required. Interior finishes of the walls and ceilings consist of painted hardboard. Foundations are of poured concrete with the first floor being poured in placed concrete slabs.

2.2.1.1 Building Exterior Envelope

The wood frame building exterior walls are clad in pre-painted vertical metal siding. Several colours are noted, all with significant paint fade. Replacement is recommended. The roof is sloped with asphalt shingle finish. Attics were not accessible. Eaves are clad in pre-painted aluminum and vented vinyl soffits. Shingles appear to be in good condition. Windows are located high in the repair bay as well as in the washroom. Windows appear to be in good condition. The single exterior personnel door is hollow metal in pressed steel frame. It shall be painted. The large overhead door is contemporary, and is fabricated of pre-painted steel and rigid insulation sandwich panels and is operated by an electric operator.

2.2.1.2 Building Interior

Floors on the first level are poured in place concrete slabs on grade that require re-painting. Interior finishes of exterior walls is painted hardboard as are ceilings. Interior rooms are of wood stud and joists with similar finishes. Re-painting would be recommended. Hardboard has a high flame spread. Encapsulation with a non-combustible material, such as drywall is recommended. The

washroom/laundry is in fair condition with space being limited and requiring re-painting. The other interior rooms are in fair condition with accumulated dust and dirt requiring cleaning and painting. No fire or sound ratings were noted. Stairs are open wood design opening into the repair garage and do not meet current codes. The garage includes an in floor repair pit which has an access ships ladder at one end only. Removable steel guard rails are all around. The garage houses an overhead crane, welding and other mechanical repair equipment. There was no attic access available to inspect roof sheeting condition, trusses, or insulation levels and condition.

2.2.1.3 Building Code

The building is classified as F-2 Medium Hazard Industrial by the NBCC 2010.

2.2.1.4 Accessibility

The building is not accessible to persons with disabilities and due to its age and function would not be required to be such.

2.2.1.5 Selected NBCC 2010/LSC 101 Requirements

The following provides an overview of several National Building Code/Life Safety Code NFPA 101 requirements and applicable sections for this facility.

Requirements	**Compliance / Action**
17) <u>Building Occupancy</u> Group F-2 – Medium Hazard Industrial *NBCC A-3.1.3.1*	Compliant
18) <u>Group F, Division 2, Up To Two Storeys</u> 3. A building classified as Group F, Division 2 is permitted to be of combustible construction or non-combustible construction used singly or in combination, provided: c. It has a building are not more than i. 900 m^2 if facing 3 streets, d. It is not more than two storeys in building height; e. Floor assemblies are fire separations and if of combustible construction, rated 45 minutes, and f. Loadbearing walls, columns, and arches supporting a rated assembly shall also be rated for 45 minutes or be of non-combustible construction. *NBCC 3.2.2.76*	Non-compliant 2nd floor shall have a 45 minute fire ratings added
19) <u>Occupant Load (Based on LSC)</u> Group F2 - Medium Hazard Industrial: 143 m^2/46 m^2 per person = 3 Total Occupant Load = 3 persons (Service rooms, storage, circulation and washrooms are excluded)	Compliant
20) Exit Capacity The maximum size of rooms or suites with one exit are as follows: Group F-2 – 150 m^2 with a 10 metre travel distance to the egress door.	Compliant

Requirements	Compliance / Action
NBCC 3.4.2.1.A	
21) Except if exits are located along the perimeter of the floor area and each main aisle in the floor area leads directly to an exit, the travel distance may be 60 metres maximum. NBCC 3.4.2.5	Compliant
22) The minimum width of a public corridor shall be 1100 mm. *NBCC 3.3.1.9*	N/A
23) Travel Distance shall be maximum of 30 metres. *NBCC 3.4.2.5*	Compliant
24) Exit capacity 3 persons x 6.1 mm per person = 18.3 mm *NBCC 3.4.3.2*	Compliant
25) Common laundry rooms can be separated from the remainder of the building by a rated fire separation of 45 minutes. *NBCC 3.3.1.22*	Non-compliant fire rate the washroom/laundry.
26) Exits shall be separated from the remainder of the building by a fire separation having a fire resistance rating of not less than 45 minutes. *NBCC 3.4.4.1*	Non-compliant 2nd floor exit is not enclosed, rated or protected to the exterior. Provide such enclosure.
27) Washroom Fixture Calculation Group F2 - 3 persons: 1 washroom *NBCC 3.7.2.2*	Compliant
28) The building need not be designed to meet the NL Accessibility Act due to its function and age.	Compliant
29) Limiting distance:	Compliant

2.2.1.6 Conclusions and Recommendations

The building is in fair condition. Carryout code and finishes upgrades.

The following short term recommendations are made:

- Fire rate laundry room.
- Clean building interior.
- Reconstruct stairs to meet code.
- Provide emergency egress from opposite end of repair pit plus electrical and ventilation to code.
- Provide attic access hatch and study attic condition and attic ventilation. Add ventilation and insulation to code if required.
- Firerate the second floor and the exit from it to the exterior.
- Paint exterior door.
- Paint building interior.

The following mid- term recommendations are made:

- Replace metal siding.
- Replace roof shingles.

2.2.2 Structural Assessment

The Maintenance Garage at the Whitbourne Eastern Area Depot is assumed to be a timber framed structure with pre-engineered timber trusses forming a gable roof. The timber framed building is supported on a concrete foundation wall, with the interior floor being a concrete slab on grade. The roof is weatherproofed with asphalt shingles while the walls are weatherproofed with metal cladding.

2.2.2.1 Foundation and Floor Systems

The foundation wall appears to be in fair condition as there was only small vertical cracks noted (see Structural photo 1). It appears as though the cracking is caused by shrinkage cracks that developed during curing. There is also concrete damage around the man door at the side of the building. It appears as though the foundation concrete may have been chipped to make an opening for the door installation (see Structural photo 2). Large voids in the concrete adjacent to the door are now present due to this chipping.

The ground floor of the maintenance garage consists of a concrete slab on grade with a large service pit off to one side (see Structural photo 3). Both the pit and slab on grade appear to be in good condition. The only defects noted on the concrete was minor shrinkage cracks and typical marks due to equipment abrasion (see Structural photo 4).

2.2.2.2 Roof Systems

It is assumed the roof system is constructed using pre-engineered timber trusses sheathed with plywood and weatherproofed with asphalt shingles. The roof elements could not be visually inspected as they are concealed by ceiling finishes. The roof is assumed to be in good condition as there does not appear to be any signs of overstress such as excessive deflection or cracking of the ceiling finishes. It should be noted that the inspection was conducted during the summer and therefore the loading on the roof would be minimal. In order to get an accurate assessment of the adequacy of the roof, the roof should be inspected in the winter when the largest load would be present.

2.2.2.3 Framing Systems

As mentioned in section 2.2.2 although the wall framing was not visible it is assumed to be a timber framed structure. Although the framing could not be viewed there did not appear to be cracking in the finishes which would indicate excessive deflections. All walls appeared to be plumb.

2.2.2.4 Mezzanines

A mezzanine which houses an office and storage area is located at the back of the garage. Two rooms are located below the mezzanine floor; a bathroom and another room which was locked. The floor system of the mezzanine could not be viewed as it was concealed by ceiling finishes on the

underside of the floor framing. While walking over the floor there did not appear to be any large deflections or sags in the system. It should be noted however that a fair amount of moisture or staining was present at the location where the air compressor is stored (see Structural photo 5). Since the floor system could not be visually inspected, it will be classified as being in fair condition.

2.2.2.5 Hoist

The garage area is equipped with a hoist with a maximum lifting capacity of 17.8kN (4000lbs). The hoist is connected to the roof structure by way of a large steel plate which appears to bolt to the roof trusses at approximately 600mm (24”). The hoist is bolted and bears on the concrete slab. The hoist appears to be in good condition with only minor corrosion noted on the edges of the flanges.

2.2.2.6 Conclusions and Recommendations

Overall the maintenance garage is considered to be in fair condition. Based on the observations made during the inspection the following is recommended.

- The damaged concrete adjacent to the man door should be repaired. Currently there is a large piece of concrete that has spalled from the vertical corner. The concrete if not fixed the condition is expected to worsen due to freeze thaw cycles.

2.2.3 Mechanical Assessment

2.2.3.1 Plumbing – Drainage, Waste, and Venting

The facility is provided with one washroom containing a water closet, lavatory, and service sink. A domestic clothes washer is also located in this room (see Mechanical Photos 1 and 2).

Visible sanitary drainage and vent piping is ABS.

The fixtures are vented through the rear wall of the Maintenance Garage which is a plumbing code violation (see Mechanical Photo 3).

The sloped roof of the building is not provided with any roof drains.

The service pit in the garage is equipped with a sump pump (see Mechanical Photo 4). The sump appears to have had petroleum products in it. The pump should be replaced with one suitable for hazardous areas. It was not observed on site if discharge from this pump is separated in an oil interceptor prior to discharging. Presence of an oil interceptor and regular maintenance should be confirmed. If an interceptor is not present one should be installed and connected to all floor drains in the facility.

2.2.3.2 Plumbing – Domestic Water Piping and Systems

The source of domestic water is unknown though it may be from the same well that feeds the main office/warehouse building. The water entrance appears to be located under the stairs to the mezzanine. There is no apparent strainer, pressure reducing valve, or water meter present.

Hot water is generated by a 36 Litre (8 Imp Gal) electric hot water tank (see Mechanical Photo 5). The tank is a 1.5 kW Rheem model number RE10. The hot water heater appeared to work properly.

Hot water temperature was measured to be 52.8°C which is acceptable. The tank was manufactured in 2004 based on its serial number. Based on its date of manufacture this tank has served its useful life. The hot water tank relief piping is run into a plastic bottle. As a result the tanks installation is not plumbing code compliant.

Hot and cold water piping within the building is copper and is not insulated. The piping appears to be in good condition though its age is unknown. A non-freeze hose bib is provided at the side of the building near the single access door.

2.2.3.3 PLUMBING – FIXTURES

The facility is provided with a water closet, lavatory, and service sink in the washroom. The water closet is a floor mounted type with flush box. The water closet worked properly.

The lavatory is a wall hung type china unit with two handle faucet. Washing machine is connected to the lavatory faucet.

The service sink is a enameled cast iron unit with back mounted faucet. The sink and two handle faucet are in good condition and operated properly.

A self contained wall mounted eyewash unit is provided in the Maintenance Garage. The unit is inspected and maintained on a regular basis.

2.2.3.4 HVAC – AIR HANDLING SYSTEMS

The facility is provided with two exhaust fans. The service bay area is provided with a propeller type wall exhaust fan with outside hood (see Mechanical Photo 6). The fan operated properly during the site visit. It was not confirmed if this fan has the capacity to meet general ventilation requirements for this space. There is no source of make-up air present when this fan is operating other than what would come in through open doors or windows or around cracks in the building envelope. Without a source of make-up air there is no way to determine if exhaust rates are in accordance with NBCC and ASHARE codes and standards. New general exhaust capability should be provided in the facility.

The service pit is equipped with an exhaust air duct which runs to a side wall exhaust fan located on the outside of the building (see Mechanical photos 7 and 8). This fan could not be operated during the site visit. This fan is required to operate continuously when the building is occupied. The fan should be replaced with a unit of non-sparking construction and suitable for conveyance of combustible gases and provided with a visible indication of system operating. There is no source of make-up air present when this fan is operating other than what would come in through open doors or windows or around cracks in the building envelope. Without a source of make-up air there is no way to determine if exhaust rates are in accordance with NBCC and ASHARE codes and standards.

There was no washroom exhaust air which is a NBCC/ASHRAE code requirement.

Due to the presence of welding in the facility a fume removal system composed of a articulating arm and flexible fume collection hose along with an exhaust fan should be installed. This system would allow the flexibility to do welding work in various parts of the facility.

2.2.3.5 HVAC – Ventilation Air

There is no source of ventilation air for the building other than what infiltrates through cracks in the building envelope and around openings such as doors and windows. This building is not compliant with the National Building Code of Canada which required all buildings to be ventilated in accordance with ASHRAE 62.1.

It is recommended that a ventilation system be installed in the building to bring in minimum required outside air. Use of heat recovery ventilator is recommended for energy savings. The existing washroom would be ducted to the new heat recovery unit in lieu of a washroom exhaust fan. The new system would be provided with an outside air intake, exhaust air discharge, supply air electric tempering coil, associated controls, distribution ductwork and grilles, zone isolation dampers, and fire dampers. The heat recovery unit should be provided with face and bypass capability or preheat to enable continuous operation (no recirculation or supply fan shutdown type defrost). The unit could be located in the mezzanine level compressor room. Ductwork would be run under the existing service bay ceilings and down to the lower floor spaces.

A tempered make-up air system should be provided to allow additional air as required to enter the building when general, welding, and pit exhaust systems are operational.

2.2.3.6 HVAC – Controls

There are no HVAC controls present. The existing exhaust fans are controlled by manual starters.

A carbon monoxide (CO) gas detector unit is located on the west side of the garage (see Mechanical Photo 5). It is a Critical Environmental Technologies model MAC-AMCO-IJN provided with a readout and audible alarm. The CO detector is not wired in to control building exhaust fans. A nitrogen dioxide (NO2) sensor should also be provided as diesel powered vehicles may also be serviced in the garage. No gas sensing was present in the service pit. A CO sensor should be located here. Additional gas detection signaling in the form of audible and visual (strobe) should be provided. The upgraded gas detection system should be interlocked with general exhaust and make-up air system to automatically operate these in the event of low gas levels being detected. Upon high gas levels detected the audible and visual alarms would be triggered.

2.2.3.7 Fire Protection

The facility is provided with six dry chemical fire extinguishers with one in the service pit, four in the garage bay, and one on the mezzanine level. The extinguishers are regularly inspected and are up to date.

2.2.3.8 Conclusions and Recommendations

The following recommendations are made for mechanical improvements to the depot building.

Plumbing:

- Modify vent piping to be code compliant.
- Replace existing service pit sump pump with one rated for hazardous location including associated wiring.
- Presence of an oil interceptor and regular maintenance should be confirmed. If an interceptor is not present one should be installed and connected to the building floor drainage system.
- Insulate accessible domestic hot and cold water piping.
- Replace hot water tank.
- Extend hot water tank relief piping to within 300mm of floor or less providing an air break.
- Provide a domestic water hose reel in the service bay area.

HVAC:

- Provide a heat recovery unit to meet minimum ventilation requirements.
- Investigate and repair any issues with the service pit exhaust system. Replace exhaust fan with one of non-spark construction and suitable for conveyance of combustible gases. Provide visual system operation proving light.
- Provide welding fume extraction exhaust system.
- Increase general exhaust rates if required and provide tempered make-up air system for general exhaust capacity and pit and welding exhaust systems.
- Upgrade gas detection system with additional sensors, visual and audible alarm indication, and interlock with exhaust and make-up air systems.
- Provide nitrogen dioxide gas detection system if diesel vehicles are serviced in the garage.

2.2.4 Electrical Assessment

2.2.4.1 Service and Distribution

2.2.4.1.1 Description

The electrical service enters the garage building overhead from a 25 kVA pole mounted single phase distribution transformer (Refer to Electrical photo 1).

The main incoming service conductors to the building are connected to a 200A disconnect switch. The main disconnect feeds main 200A, 120/240V panelboard located nearby (Refer to Electrical photo 2).

Revenue metering is performed at 120/240V, single phase, 200A service. The meter is located outside on building wall.

Service entrance grounding is provided at the building main disconnect using grounding rod driven in the ground outside the building

2.2.4.1.2 OBSERVATIONS

The incoming 200A at 120/240V service capacity appears to be adequate based on the peak demand history over the past 3 years.

The main disconnect and the distribution panelboard appear to be more than thirty (30) years old and are in poor physical condition (Refer to Electrical photo 3).

Panelboard is surface mounted in the workshop area and feeds all building lighting, heating and receptacle loads. There are five (5) circuit breaker spaces available only on the panelboard.

2.2.4.1.3 CONCLUSIONS

Based on the visual inspection of the facility, all power distribution equipment has exceeded its service life expectancy. New main disconnect and panelboard with sufficient spare capacity have to be installed in the next five (5) years.

2.2.4.2 EMERGENCY POWER SYSTEM

There is no emergency power distribution system.

2.2.4.3 LIGHTING

2.2.4.3.1 DESCRIPTION

The office area is illuminated by 4 ft. surface mounted florescent fixture with a T8 Lamps. (Refer to Electrical photo 4).

The workshop area lit with 4 ft. surface mounted 2–lamp, T8 linear open fluorescent fixtures and four (4) high bay metal halide lighting fixtures (Refer to Electrical photo 5).

The service pit is provided with 4 ft. surface mounted 2–lamp, T8 linear vapour proof fluorescent fixtures.

The exterior building lighting is provided by three (3) photocell controlled HID wallpacks installed on building walls.

The building lighting is fed from the 120/240V panelboard.

2.2.4.3.2 OBSERVATIONS

Office areas, corridors and warehouses were observed to have adequate lighting levels as required by the latest edition of the NBCC.

Most of the lighting fixture in the office and workshop areas are old and are in poor condition.

One of the exterior lights is relatively new and in good condition. The other two (2) exterior fixtures are old and in poor condition.

The service pit lighting fixtures are not rated for hazardous locations.

2.2.4.3.3 Conclusions

All old interior and exterior lighting fixtures have to be replaced. Install new photocell control for the exterior lighting.

Service pit lighting and wiring to be replaced with suitable material for hazardous locations.

2.2.4.4 Exit and Emergency Lighting

2.2.4.4.1 Description

The building emergency lighting consists of one (1) dual head emergency battery unit. Most of the battery units are new and in good condition.

The building is equipped with two (2) lighted exit signs located above each exit doors. They have battery backup and are lit with incandescent lamps.

(Refer to Electrical photos 5 and 6 for emergency and exit lighting)

2.2.4.4.2 Observations

Emergency lighting units and exit signs are adequate and are in fair condition.

2.2.4.4.3 Conclusions

Provide 30-second monthly functional test. Consider battery replacement for 10 years old lead acid battery or for 15 years old nickel cadmium battery.

2.2.4.5 Heating System

2.2.4.5.1 Description

The whole building is heated by electrical heaters. The workshop area is heated by electric unit heater c/w wall mount thermostat. There is a convection heater c/w wall integral thermostat in the washroom.

2.2.4.5.2 Observations

The electric heaters are in relatively good condition.

2.2.4.5.3 Conclusions

No heater replacement will be required in the next 10 years.

2.2.4.6 Wiring Devices

2.2.4.6.1 Description

U-grounded, duplex receptacles are installed throughout the building. Receptacles are recessed with the exception of the receptacles installed in the workshop area, which are surface mounted (Refer to Electrical photo 7). The outdoor receptacles are weather protected type duplex receptacles.

The lighting control in offices, service rooms and warehouses is provided by individual lighting switches for each circuit.

2.2.4.6.2 Observations

The indoor and outdoor receptacles and lighting switches are sufficient quantity. Some of the receptacles and lighting switches are original and are in fair condition.

The service pit receptacles are not rated for hazardous locations.

2.2.4.6.3 Conclusions

Service pit receptacles and wiring should be removed or replaced with suitable material for hazardous locations.

All old receptacles and lighting switches, including the outlet boxes and faceplates have to be replaced in the next five (5) years.

2.2.4.7 Wiring Methods

2.2.4.7.1 Description

Wiring system appears to be a combination of AC-90 and NMD90 cabling installed concealed in walls and above ceiling in the office area and TW or RW90 cabling installed in EMT conduit in workshop area.

2.2.4.7.2 Observations

The observed wiring appears to be in relatively good condition.

2.2.4.8 Fire Alarm

Not available.

2.2.4.9 CCTV / Security System

2.2.4.9.1 Description

The garage building is connected to the main office building proximity card access control system. The card access system is relatively new and in good condition. There is no CCTV system.

2.2.4.10 PA System

There is one (1) loudspeaker in good condition connected to the main office building public address (PA) system.

2.2.5 Environmental Review

2.2.5.1 Air Emissions

No air emissions are present from the facility from fuel burning equipment or processes using chemicals.

2.2.5.2 Asbestos Containing Materials

An asbestos survey provided to the consultant indicated the presence of asbestos in floor tile. The presence of these asbestos containing materials shall be made aware to any personnel undertaking work in the facility that could disturb these materials.

2.2.5.3 Lead Containing Materials

Lead is likely present in plumbing solder and possibly in oil based paints used in the facility. The potential presence of lead containing materials shall be made aware to any personnel undertaking work in the facility that could disturb these materials.

2.2.5.4 PCB Containing Materials

Fluorescent lighting in the facility is not old enough to be of concern for presence of PCB's that were commonly used in older lighting ballasts.

2.2.5.5 Ozone Depleting Substances

No potential ozone depleting substances were observed.

There was no Halon fire extinguishing systems identified in the facility.

2.2.5.6 Indoor Air Quality

While no indoor air quality issues were noticed while on site, the facility is not provided with proper ventilation and make-up air systems. Any odours, fumes, VOC's from off gassing, and other airborne pollutants cannot be effectively removed from the building.

2.2.5.7 Mould and Mildew

No signs of mould or mildew were present throughout the building.

2.2.5.8 Spills and Contaminated Areas

Signs of spills were observed inside the Maintenance Garage in the service pit based on petroleum stains (see Environmental Photo 22).

2.2.5.9 Flammable and Combustible Liquids Storage

Flammable and combustible liquids were found to be present in the Maintenance Garage (see Environmental Photos 24 to 27).

Liquids found in a safety cabinet in the facility included:

- Aerosol lubricants;
- Motor oil;
- Gasoline;
- Paint thinner;
- Gear oil;
- Aerosol paints.

Miscellaneous liquids found in the facility but not in safety cabinets included:

- Hydraulic oil;
- Lubricating oil;
- Waste oil.

Quantities present do not exceed maximum amounts allowable for incidental use.

2.2.5.10 Compressed Gases Storage

Quantities of compressed gases were observed within the building (see Environmental photo 28). Items found inside the building included:

- Propane cylinders stored in safety cabinet;
- Oxygen / acetylene cylinders;
- Argon/CO2 cylinder;

The National Fire Code of Canada prohibits the indoor storage of Class 2.1 flammable gases of which acetylene and propane are examples unless the storage is in a specially designed room and not within a specified distance of other Class 1 and Class II flammable and combustible liquids.

2.2.5.11 Conclusions and Recommendations

The following recommendations are made regarding environmental issues identified.

- Indoor air quality should be addressed as per the recommendation in the mechanical section of this report.
- The presence of asbestos and potentially lead containing materials are to be made aware to anyone undertaking work that may disturb these materials.
- Stored propane and acetylene cylinders should be moved to an outdoor storage area.

2.2.6 Energy Usage Review

Knowing the energy consumption of a facility from all sources (electricity, petroleum fuels, etc.) an energy use intensity (EUI) can be calculated which can be compared to benchmark EUI's for various types of buildings in Canada. These benchmarks represent median EUIs for various types of facilities. Energy usage information was provided for the years 2014 to 2015 for this building however the Carpentry Shop and Storage Building are both fed from the Maintenance Garage. As such determining a EUI for the Maintenance Garage alone is not possible.

2.3 Storage Building

2.3.1 Architectural Assessment

This contemporary building is a Quonset hut style fabricated in an arced shape of self-supporting galvanized steel panels. The 41 square meter single level on grade structure is founded on a concrete foundation and slab on grade floor. It is uninsulated, and serves as a single storage space for ATVs, snowmobiles, and other line equipment. The building has a single uninsulated pre-painted steel overhead door and a single hollow metal person door in a pressed steel frame. One turbine type roof exhaust ventilator sits atop the centre of the roof. The building is in good condition, requiring only minor regular maintenance.

2.3.1.1 Building Exterior Envelope

Uninsulated galvanized steel corrugated curved self supporting panels form the walls and roof in a continuous half circle arc curve. The structure is in excellent condition.

2.3.1.2 Building Interior

Concrete slabs on grade floor and walls and roof are the interior face of the exterior wall/roof curved panels exposed. No insulation is present. Interior systems are in excellent condition.

2.3.1.3 Building Code

The building is classified as F-2 – Medium Hazard industrial by the NBCC 2010.

2.3.1.4 Accessibility

The building is not accessible to persons with disabilities. Due to its size and function accessibility would not be required.

2.3.1.5 Selected NBCC 2010/LSC 101 Requirements

The following provides an overview of several National Building Code/Life Safety Code NFPA 101 requirements and applicable sections for this facility.

Requirements	**Compliance / Action**
30) Building Occupancy Group F-2 – Medium Hazard Industrial *NBCC A-3.1.3.1*	Compliant
31) Group F, Division 2, Up To Two Storeys 4. A building classified as Group F, Division 2 is permitted to be of combustible construction or non-combustible construction used singly or in combination, provided: g. It has a building are not more than 1000 m^2 when facing one street h. It is not more than one storey in building height. *NBCC 3.2.2.76*	Compliant
32) Occupant Load (Based on LSC) Group F2 - Medium Hazard Industrial: 41 m^2/46 m^2 per person = 1 Total Occupant Load = 1 person (Service rooms, storage, circulation and washrooms are excluded)	Compliant
33) Exit Capacity The maximum size of rooms or suites with one exit are as follows: Group F-2 – 150 m^2 with a 10 metre travel distance to the egress door. *NBCC 3.4.2.1.A*	Compliant
34) Except if exits are located along the perimeter of the floor area and each main aisle in the floor area leads directly to an exit, the travel distance may be 60 metres maximum. NBCC 3.4.2.5	Compliant
35) The minimum width of a public corridor shall be 1100 mm. *NBCC 3.3.1.9*	N/A
36) Travel Distance shall be maximum of 30 metres. *NBCC 3.4.2.5*	Compliant
37) Exit capacity	Compliant

Requirements	Compliance / Action
1 persons x 6.1 mm per person = 6.1 mm *NBCC 3.4.3.2*	
38) Washroom Fixture Calculation *NBCC 3.7.2.2*	Building is uninsulated and used for storage only. No washroom is required.
39) The building need not be designed to meet the NL Accessibility Act requirements due to its size and function.	Compliant
40) Limiting distance:	Compliant

2.3.1.6 Conclusions and Recommendations

The building is contemporary and other than routine maintenance, does not require upgrading.

The following short term recommendations are made:

- Seal hole in door frame, replace corroded hinges, and upgrade caulking.

2.3.2 Structural Assessment

The Whitbourne Area depot Storage Building is a pre-fabricated Quonset hut structure supported on a concrete slab on grade (see Structural photo 1). The structure is equipped with a man door and overhead door and is used to store all-terrain vehicles, skidoos, and equipment.

2.3.2.1 Foundation and Floor Systems

The concrete slab on grade appears to be in good condition based on a limited visual inspection. The interior area of the slab was almost completely concealed by the large amount of equipment being stored in the area. Based on what could be viewed, only minor shrinkage cracks are present therefore the slab is in good condition (see Structural photo 2).

An exterior concrete pad at the front of the building was found to be in good condition with no cracking, shifting or settling present.

2.3.2.2 Framing Systems

The prefabricated steel of the structure appears to be in excellent condition. Structure appears to be a newly constructed building and therefore the steel sections and bolts are free of corrosion (see Structural photo 3).

2.3.2.3 Conclusions and Recommendations

The Storage Building is in excellent condition without any structural repairs required.

2.3.3 Mechanical Assessment

2.3.3.1 Plumbing – Drainage, Waste, and Venting

No drainage waste or vent systems are present in the building.

2.3.3.2 Plumbing – Domestic Water Piping and Systems

No domestic water systems are present in the building.

2.3.3.3 Plumbing – Fixtures

No plumbing fixtures are present in the building.

2.3.3.4 HVAC – Air Handling Systems

No air handling systems are present in the building.

2.3.3.5 HVAC – Ventilation Air

No ventilation air systems are present in the building. Natural ventilation can be achieved through use of building openings.

2.3.3.6 HVAC – Controls

No HVAC controls are present in the building.

2.3.3.7 Fire Protection

The facility is provided with one type ABC dry chemical fire extinguisher. The extinguisher rating is 10A80BC and is a 13.6 kg (30 lb) size. This extinguisher is suitable for the application. The extinguisher is regularly inspected and is up to date.

2.3.3.8 Conclusions and Recommendations

Based on the intended use of this building no mechanical systems are required other than the presence of a fire extinguisher.

2.3.4 Electrical Assessment

2.3.4.1 Service and Distribution

2.3.4.1.1 Description

The electrical service enters the storage shed overhead from the Maintenance Garage building panelboard.

The main incoming service conductors to the building are connected to a 100A, 120/240V, eighteen (18) circuit panelboard (see Electrical photo 1).

There is no separate revenue metering for the building.

Service entrance grounding is provided at the building main disconnect using grounding rod driven in the ground outside the building

2.3.4.1.2 Observations

The incoming 100A at 120/240V service capacity appears to be adequate based on observed building loads.

The panelboard appears to be not more than ten (10) years old and is in good physical condition.

Panelboard is surface mounted and feeds all building lighting and receptacle loads. There are nine (9) spaces for circuit breakers available for future loads.

2.3.4.1.3 Conclusions

Panelboard is new with sufficient spare capacity.

2.3.4.2 Emergency Power System

There is no emergency power distribution system.

2.3.4.3 Lighting

2.3.4.3.1 Description

The building interior is illuminated by four (4) 4 ft. suspended from the ceiling florescent fixtures with a two (2) T8 Lamps (see Electrical photo 2).

The building exterior lighting is provided by a HID wallpack (see Electrical photo 3).

The building lighting is fed from the 120/240V panelboard.

2.3.4.3.2 Observations

The building interior was observed to have adequate lighting levels as required by the latest edition of the NBCC.

The lighting fixtures are relatively new and in good condition.

The exterior light was switched on during day time.

2.3.4.3.3 Conclusions

Consider installation of photocell control for building exterior lighting.

2.3.4.4 Exit and Emergency Lighting

2.3.4.4.1 Description

Not available.

2.3.4.5 Heating System

Not available.

2.3.4.6 Wiring Devices

2.3.4.6.1 Description

U-grounded, recessed duplex receptacles are installed throughout the building (see Electrical photo 4). The outdoor receptacles are weather protected type duplex receptacles.

The interior lighting control is provided by single lighting switch.

2.3.4.6.2 Observations

The indoor and outdoor receptacles and lighting switches are sufficient quantity. The indoor and outdoor receptacles are relatively new and in good condition.

2.3.4.7 Wiring Methods

2.3.4.7.1 Description

Wiring system appears to be building wires in surface mounted EMT conduit (see Electrical photo 4).

2.3.4.7.2 Observations

The observed wiring appears to be in relatively good condition.

2.3.4.8 Fire Alarm

Not available.

2.3.4.9 CCTV / Security System

2.3.4.9.1 Description

Not available.

2.3.4.10 PA System

Not available.

2.3.5 Environmental Review

2.3.5.1 Air Emissions

No air emissions are present from the facility from fuel burning equipment or processes using chemicals.

2.3.5.2 Asbestos Containing Materials

Based on the age of the facility the presence of asbestos containing materials is unlikely. Based on asbestos surveys provided to the consultant no asbestos was present in this building.

2.3.5.3 Lead Containing Materials

Based on the age of the facility the presence of lead containing materials is unlikely.

2.3.5.4 PCB Containing Materials

Based on the age of the facility the presence of PCB materials is unlikely.

2.3.5.5 Ozone Depleting Substances

No ozone depleting substances were identified in the building.

2.3.5.6 Indoor Air Quality

No indoor air quality issues were noticed while on site.

2.3.5.7 Mould and Mildew

No signs of mould or mildew were present throughout the building.

2.3.5.8 Spills and Contaminated Areas

No signs of spills or were overserved in the building.

2.3.5.9 Flammable and Combustible Liquids Storage

One small gasoline container was present in the building (see Environmental photo 29).

No other storage is present however stored motorized vehicles, and other engine powered equipment likely have fuels and oils contained in them.

2.3.5.10 Compressed Gases Storage

No compressed gas storage was present.

2.3.5.11 Conclusions and Recommendations

There are no environmental concerns to report.

2.3.6 Energy Usage Review

Knowing the energy consumption of a facility from all sources (electricity, petroleum fuels, etc.) a energy use intensity (EUI) can be calculated which can be compared to benchmark EUI's for various types of buildings in Canada. These benchmarks represent median EUIs for various types of facilities. As no energy usage information was provided to the consultant for this building (this building is fed from another metered building) a EUI could not be calculated and compared to benchmark data.

2.4 Carpentry Shop

2.4.1 Architectural Assessment

This 37 square meter wood frame building consists of a single open interior space which was formerly a workshop but now acts as storage for grounds maintenance equipment, tires, line tools, and other equipment. The building has a sloped roof with asphalt shingles, vinyl siding, one residential metal access door, vinyl sliding windows and is founded on what appears to be wood blocks with skirted space between floor and grade. The building is in fair to good condition.

2.4.1.1 Building Exterior Envelope

Exterior walls are of wood stud, vinyl siding, vented vinyl soffit, pre painted aluminum fascia, and sloped roof with asphalt shingle finish. Shingles exhibit two colours and are nearing the end of their useful life with replacement to be considered within the next 3-5 years. Vinyl slider windows are in good condition. The single residential type metal access door in wood frame requires painting and hardware replacement with more robust commercial type. The door sill requires replacement.

2.4.1.2 Building Interior

The plywood floor is finished with paint as are the plywood finished walls. The ceiling is finished with 300 x 300 mm residential pre-painted stapled or glued fibre ceiling tile. The attic was not accessible but gable end vents and soffit vents do exist.

2.4.1.3 Building Code

The building is classified as F-2 – Medium Hazard Industrial by the NBCC 2010.

2.4.1.4 ACCESSIBILITY

The building is not accessible to persons with disabilities and due to its size and function would not be required to be accessible.

2.4.1.5 SELECTED NBCC 2010/LSC 101 REQUIREMENTS

The following provides an overview of several National Building Code/Life Safety Code NFPA 101 requirements and applicable sections for this facility.

Requirements	**Compliance / Action**
41) Building Occupancy Group F-2 – Medium Hazard Industrial *NBCC A-3.1.3.1*	Compliant
42) Group F, Division 2, Up To Two Storeys 5. A building classified as Group F, Division 2 is permitted to be of combustible construction or non-combustible construction used singly or in combination, provided: i. It has a building are not more than ii. 1000 m^2 if facing 1 street, j. It is not more than one storey in building height. *NBCC 3.2.2.76*	Compliant
43) Occupant Load (Based on LSC) Group F2 - Medium Hazard Industrial: 37 m^2/46 m^2 per person = 1 Total Occupant Load = 1 person (Service rooms, storage, circulation and washrooms are excluded)	Compliant
44) Exit Capacity The maximum size of rooms or suites with one exit are as follows: Group F-2 – 150 m^2 with a 10 metre travel distance to the egress door. *NBCC 3.4.2.1.A*	Compliant
45) Travel Distance shall be maximum of 30 metres. *NBCC 3.4.2.5*	Compliant
46) Exit capacity 1 person x 6.1 mm per person = 6.1 mm *NBCC 3.4.3.2*	Compliant
47) Washroom Fixture Calculation *NBCC 3.7.2.2*	Building used as equipment storage only, washroom not required.
48) The building need not be designed to meet the NL Accessibility Act requirements due to its size and function.	Compliant

2.4.1.6 CONCLUSIONS AND RECOMMENDATIONS

The building is in good condition generally.

The following short term recommendations are made:

- Repair and paint door and frame, replace sill.
- Provide attic hatch.

The following mid- term recommendations are made:

- Replace door.
- Replace roof shingles.

2.4.2 Structural Assessment

The Carpentry Building at the Whitbourne Area Depot is a small timber framed structure with a sloped roof. A skirting wrapping around the perimeter of the building prevented the inspectors of determining what supports the structure (see Structural photo 1).

2.4.2.1 Foundation and Floor Systems

The foundation of the storage building was not visible as skirting was installed around the perimeter of the building. The fact that skirting is installed around the perimeter suggests that the structure is supported on either concrete piers or timber piles. It is difficult to comment on the condition of the supports as they can't be inspected visually. The floor system appears to be solid with no sags excessive deflections or dips which would suggest that the foundation would have failed. As the foundations could not be visually inspected, they will be assessed as being in fair condition.

2.4.2.2 Roof Systems

The structural components of the roof system were not visible however it is assumed that the roof structure consists of either timber rafters or timber trusses. Small ceiling tiles finish conceal the trusses from the underside. There doesn't appear to be any excessive deflections in the ceiling that would suggest overstressing. It appeared as though there was water damage on the ceiling tiles above the tire storage area however a closer visual determined that it was in fact scrapes caused by abrasion of tires (see Structural photo 2). Although there doesn't appear to be any excessive deflections, the inspection was conducted in the summer where loads on the roof are minimal. To accurately determine the adequacy of roof system inspections must be conducted in the winter where loads on the roof system will be at their maximum. Based on the limited visual inspection, the roof system appears to be in fair condition.

2.4.2.3 Framing Systems

The timber framed walls are finished on the interior with wood paneling. The walls appears to be in fair condition as they appear to be plumb and free of any excessive deflections which may indicate overstressing.

2.4.2.4 Conclusions and Recommendations

Overall the Carpentry Building appears to be in fair condition based on a limited visual inspection. There does not appear to be structural repairs required.

2.4.3 Mechanical Assessment

2.4.3.1 Plumbing – Drainage, Waste, and Venting

No drainage waste or vent systems are present in the building.

2.4.3.2 Plumbing – Domestic Water Piping and Systems

No domestic water systems are present in the building.

2.4.3.3 Plumbing – Fixtures

No plumbing fixtures are present in the building.

2.4.3.4 HVAC – Air Handling Systems

No air handling systems are present in the building. The building was formally used as a carpentry shop however now it is used primarily for storage of tires, paints, and equipment. Due to the potential fumes the building should be provided with a ventilation system.

2.4.3.5 HVAC – Ventilation Air

There is no source of ventilation air for the building other than what infiltrates through cracks in the building envelope and around openings such as doors and windows. This building is not compliant with the National Building Code of Canada which required all buildings to be ventilated in accordance with ASHRAE 62.1.

It is recommended that a ventilation system be installed in the building to bring in outside air. Use of heat recovery ventilator is recommended for energy savings. The new system would be provided with an outside air intake, exhaust air discharge, supply air electric tempering coil, associated controls, and distribution ductwork and grilles. The unit can be mounted inside the building and ductwork either run through the attic (insulated) or tight to the ceiling (uninsulated).

2.4.3.6 HVAC – Controls

No HVAC controls are present in the building.

2.4.3.7 Fire Protection

The facility is provided with one type ABC dry chemical fire extinguisher. The extinguisher rating is 10A120BC and is a 9.1 kg (20 lb) size. This extinguisher is suitable for the application. The extinguisher is regularly inspected and is up to date.

2.4.3.8 Conclusions and Recommendations

Based on the intended use of this building it should be provided with a ventilation system.

2.4.4 Electrical Assessment

2.4.4.1 Service and Distribution

2.4.4.1.1 Description

The electrical service enters the carpenter shop building overhead from the Maintenance Garage building panelboard.

The main incoming service conductors to the building are connected to a 100A disconnect switch. The main disconnect feeds main 100A, 120/240V fused load center located nearby (see Electrical photo 1). A load center c/w eight (8) 15A circuit breakers located at work bench is fed from the main load center (see Electrical photo 2).

There is no separate revenue metering for the building.

Service entrance grounding is provided at the building main disconnect using grounding rod driven in the ground outside the building

2.4.4.1.2 OBSERVATIONS

The incoming 100A at 120/240V service capacity appears to be adequate based on observed building loads.

The main disconnect and the main load center appear to be more than thirty (30) years old and are in poor physical condition. The workbench load center is in relatively good condition.

Load centers is surface mounted in the workshop area and feeds all building lighting, heating, power tools and receptacle loads. There are four (4) spaces for fuses available at main load center for future loads.

2.4.4.1.3 CONCLUSIONS

Based on the visual inspection of the facility, the main disconnect and main load center have exceeded their service life expectancy. New main disconnect and main load center with sufficient spare capacity have to be installed in the next five (5) years.

2.4.4.2 EMERGENCY POWER SYSTEM

There is no emergency power distribution system.

2.4.4.3 LIGHTING

2.4.4.3.1 DESCRIPTION

The building interior is illuminated by four (4) 4 ft. surface mounted florescent fixtures with a two (2) T8 Lamps (see Electrical photo 3).

There is no building exterior lighting.

The building lighting is fed from the 120/240V load center.

2.4.4.3.2 OBSERVATIONS

The building interior was observed to have adequate lighting levels as required by the latest edition of the NBCC.

The lighting fixtures are relatively new and in good condition.

2.4.4.3.3 CONCLUSIONS

Consider installation of photocell controlled building exterior lighting.

2.4.4.4 EXIT AND EMERGENCY LIGHTING

2.4.4.4.1 DESCRIPTION

Not available.

2.4.4.4.2 OBSERVATIONS

Not applicable.

2.4.4.4.3 CONCLUSIONS

Install one (1) dual head emergency battery unit in carpenter shop.

2.4.4.5 HEATING SYSTEM

2.4.4.5.1 DESCRIPTION

The building is heated by electrical baseboard heaters.

2.4.4.5.2 OBSERVATIONS

The electric baseboard heaters are old and in poor condition.

2.4.4.5.3 CONCLUSIONS

Consider baseboard heater replacement in the next five (5) years.

2.4.4.6 WIRING DEVICES

2.4.4.6.1 DESCRIPTION

U-grounded, recessed duplex receptacles are installed throughout the building (see Electrical photo 4). The outdoor receptacles are weather protected type duplex receptacles.

The interior lighting control is provided by single lighting switch.

2.4.4.6.2 OBSERVATIONS

The indoor and outdoor receptacles and lighting switches are sufficient quantity. The indoor receptacles and lighting switch are original and are in fair condition. The outdoor receptacles are relatively new and in good condition.

2.4.4.6.3 CONCLUSIONS

All old receptacles and lighting switches, including the outlet boxes and faceplates have to be replaced in the next five (5) years.

2.4.4.7 WIRING METHODS

2.4.4.7.1 DESCRIPTION

Wiring system appears to be a combination of AC-90 and NMD90 cabling installed concealed in walls and above ceiling.

2.4.4.7.2 Observations

The observed wiring appears to be in relatively good condition.

2.4.4.8 Fire Alarm

Not available.

2.4.4.9 CCTV / Security System

2.4.4.9.1 Description

Not available.

2.4.4.10 PA System

Not available.

2.4.5 Environmental Review

2.4.5.1 Air Emissions

No air emissions are present from the facility from fuel burning equipment or processes using chemicals.

2.4.5.2 Asbestos Containing Materials

Based on the age of the facility the presence of asbestos containing materials is unlikely. Based on asbestos surveys provided to the consultant no asbestos was present in this building.

2.4.5.3 Lead Containing Materials

Based on the age of the facility the presence of lead containing materials is unlikely.

2.4.5.4 PCB Containing Materials

Based on the age of the facility the presence of PCB materials is unlikely.

2.4.5.5 Ozone Depleting Substances

No ozone depleting substances were identified in the building.

2.4.5.6 Indoor Air Quality

No indoor air quality issues were noticed while on site.

2.4.5.7 Mould and Mildew

No signs of mould or mildew were present throughout the building.

2.4.5.8 Spills and Contaminated Areas

The building has wood floors and some stains likely from petrochemicals were observed (see Environmental photos 30 and 31). The stains appear to be surface stains only and likely did not penetrate the flooring system to contaminate the ground below, however this could not be confirmed.

2.4.5.9 Flammable and Combustible Liquids Storage

Flammable and combustible liquids were found to be present in the Carpentry Shop in the safety cabinet and around the building (see Environmental photos 32 to 34). Liquids found included:

- Gasoline;
- Diesel fuel;
- Insulator coating.

Quantities present do not exceed maximum amounts allowable for incidental use.

2.4.5.10 Compressed Gases Storage

No compressed gas storage was present.

2.4.5.11 Conclusions and Recommendations

Numerous spillage stains were observed in this building. It is suggested that greater care be taken when dispensing petroleum products.

2.4.6 Energy Usage Review

Knowing the energy consumption of a facility from all sources (electricity, petroleum fuels, etc.) a energy use intensity (EUI) can be calculated which can be compared to benchmark EUI's for various types of buildings in Canada. These benchmarks represent median EUIs for various types of facilities. As no energy usage information was provided to the consultant for this building (this building is fed from another metered building) a EUI could not be calculated and compared to benchmark data.

2.5 Civil/Site Assessment

2.5.1 Asphalt and Concrete Surfaces

The Office Area entrance of the main building is provided with concrete walkways and steps (see Site/Civil photo 1). These concrete structures are in good condition.

The parking lot on the public side of the main building is paved and in good condition (see Site/Civil photo 2).

The yard directly to the south of the main building is paved and in good condition (see Site/Civil photo 3).

2.5.2 Water and Sewer

Water supply for the main building is from an onsite drilled well. Based on drawings provided, this well is located south of the shops/warehouse area of the building. The location of this well could not be confirmed during the site visit. Water enters the main building in the Communications Shop.

Based on drawings provided, the main building is provided with a septic tank and distribution field at the east side of the building. Based on drawings provided, the Maintenance Garage is provided with a septic tank and distribution field at the east side of the building. The septic tanks or other infrastructure was not visible during the site visit.

No issues with the water system or sewage system were reported during the site visit.

2.5.3 Drainage

The site generally slopes from the north to the south with surface drainage going to a stream located to the south of the property (see Site/Civil photos 4 to 7). No standing water was observed on site. It appears that relatively recent site work was done for underground drainage piping or a washout based on the different soil type apparent heading towards the stream (see Site/Civil photo 8).

Based on drawings provided the main depot building is provided with foundation drainage. There is no indication that either the maintenance garage or storage building are provided with foundation drainage, however it may be present.

2.5.4 Site Fencing

The depot yard is surrounded by a chain link fence. All buildings are located within the fenced in yard with the exception of the front of the main depot building which houses the offices.

Inspection of the fencing revealed some issues including (see Site Civil Photos 9 to 19):

- Sections of fence leaning on north, east, south, and west sides.
- Fencing off of bottom on north, east, and west sides.
- Fencing bowed out, bracing bent, and off of brace fittings possibly from snow clearing at south west corner.
- One fence post split at bottom at south west corner.
- Barbed wire supports off on south and west sides.

2.5.5 Conclusions and Recommendations

The following recommendations are made for site civil:

- Make repairs to site fencing.

CHAPTER 3 REHABILITATION EXPANSION UPGRADE ASSESSMENT

3.1 Main Depot Building

Based on current usage, and beyond repairs and code upgrades identified in Chapter 2 of this report, no major rehabilitation, expansion, or upgrades are recommended for this facility.

3.2 Maintenance Garage

Based on current usage, and beyond repairs and code upgrades identified in Chapter 2 of this report, no major rehabilitation, expansion, or upgrades are recommended for this facility.

3.3 Storage Building

Based on current usage, and beyond repairs identified in Chapter 2 of this report, no major rehabilitation, expansion, or upgrades are recommended for this facility.

3.4 Carpentry Building

Based on current usage, and beyond repairs and code upgrades identified in Chapter 2 of this report, no major rehabilitation, expansion, or upgrades are recommended for this facility.

CHAPTER 4 COST ESTIMATES

4.1 Recommended Renovations and Improvements to Existing Facilities

4.1.1 Purpose

This section provides an overview of the costs associated to complete the recommended repairs and upgrades outlined above for each building to maintain current operations and functionality and comply with current codes. New construction and extension cost estimates include incorporation of expansion, and upgrading of facilities to service future operational requirements.

Renovation, maintenance and repair costs are grouped into three categories: Immediate; Mid-Term; and Long-Term. The work considered for immediate repairs would include all things which pose a threat to life safety and would also include correcting deficiencies with structural, civil, environmental, mechanical, and electrical. For the regularly occupied buildings, and buildings intended for long-term use, these renovations would be very important to complete for the safety, well-being, and comfort of occupants. For buildings determined to be unsuitable for long-term future use, only repairs which are deemed absolutely necessary would be considered.

Mid-term repairs would be intended for completion in the 3 to 10 year range, assuming the repairs listed as immediate are completed. This could include such items as architectural finishes replacement, end of serviceable life equipment replacement or upgrading of equipment to better service the facility. The long-term repair category would also only apply to buildings intended for extended use as these repairs would fall in the range of 10 to 20 years. These long-term repairs also require the immediate and mid-term repairs to be completed as intended.

4.1.2 Cost Estimating Accuracy

The estimates contained in this report are intended to provide order of magnitude construction costs only and are accurate to Class 3 (-10 to +30%) standards as per generally recognized industry practices. Estimates are based on the site observations (repairs & upgrades) and with the owner's future use and operations considered (new construction/extension). The estimates include appropriate contractor overhead, design contingency and location factors. All estimates are intended to provide an order of magnitude indication of the final project cost and are considered to be sufficient for the purpose of analyzing the redevelopment options under consideration. The figures listed below are an indication of the probable construction cost at the time of this report and are intended to represent fair market value of the scope of work assuming that such work is grouped into reasonably sized contract packages. Unless noted otherwise, architectural and

engineering design fees are not included, nor are value-added taxes. All costs are expressed in Canadian dollars.

4.1.3 Main Depot Building

4.1.3.1 Immediate Maintenance and Repairs

The following renovations, repairs, and/or upgrades are recommended to be completed within the next two years, assuming the facility is intended to continue operations.

Architectural:

- Replace stained ceiling tiles - $1,500
- Repoint brick - $3,500
- Provide non-skid treads c/w tactile to corridor stairs - $1,200
- Correct code exiting and fire ratings deficiencies - $18,000
- Add gutter and downspout systems - $5,000
- Paint doors and frames - $2,500
- Provide correct code to code guards and stair rails in shops and warehouse - $7,500

Structural:

- Foundation wall should be exposed in locations where larger horizontal cracks and spalling is noted. It is recommended to remove cladding and carry out required excavation in the location of the damage to uncover full extent of the damage. Once the full damage of the crack is determined an appropriate repair detail can be recommended - $5,500
- All tools must be removed from horizontal cross bracing - $500
- Cracks in concrete block partition walls possibly caused by settlement should be monitored to ensure condition does not worsen - $2,500 (annually)

Site/Civil:

- Make repairs to site fencing - $16,000

Mechanical:

- Replace any ABS piping present in the office area return air plenum with copper or plenum rated plastic DWV - $4,000
- Replace domestic hot water tank - $1,200
- Provide insulation on uninsulated domestic water piping - $2,500
- Verify office area control operation and set up for continuous operation during occupied periods - $800
- Inspect and service office area steam humidifier - $1000
- Provide a dedicated cooling system for the Electrical/Server Room - $6,500
- Replace the warehouse/workshop area Lunch Room range hood - $900
- Rebalance outside air rates to office area - $2,000
- Provide heat recovery ventilation system to provide minimum outside air to warehouse/shop area of building - $48,000

Electrical:

- The old exterior lights and associated controls should be replaced - $13,500
- Investigate and repair baseboard heater in space off of warehouse area - $800

- All outdoor receptacles, including the outlet boxes and the weather protective covers need replacement - $3,200
- Replace any outdated emergency lighting batteries - $1,200
-
- Installation of visual alarms in fire alarm system for aiding any potential hearing impaired occupants - $8,500
- Relocate fire alarm annunciator/control panel next to the main entrance as required by NBCC - $4,500

Environmental:

- Indoor air quality should be addressed as per the recommendation in the mechanical section of this report – Refer to Mechanical section.
- Stained soil in the depot yard should be removed and properly disposed of. Stains on interior floors should be cleaned - $1,200
- Stored propane cylinders should be moved to an outdoor storage area - $2,200

Estimated total cost for immediate repairs and upgrades:
$165,700 sub-total cost x 10% contingency = $182,300 total cost

4.1.3.2 Mid-Term Maintenance and Repairs

The following list contains recommended renovations and repairs for completion in the next 3 to 10 years, again assuming the building will remain in operation. These repairs would progress after the items listed in the immediate repair category are complete.

Architectural:

- Replace metal siding - $53,900
- Replace remaining three fibreglass overhead doors - $24,000
- Paint interior of building - $14,000
- Replace metal roofing - $53,400

Mechanical:

- Replace copper domestic water piping throughout facility - $13,000

Electrical:

- Install new panelboards with sufficient spare capacity - $24,000

Estimated total cost for mid-term repairs and upgrades:
$182,300 sub-total cost x 10% contingency = $200,500 total cost

4.1.4 Maintenance Garage

4.1.4.1 Immediate Maintenance and Repairs

The following renovations, repairs, and/or upgrades are recommended to be completed within the next two years, assuming the facility is intended to continue operations.

Architectural:

- Fire rate laundry room - $2,500
- Clean building interior - $1,500

- Reconstruct stairs to meet code - $2,800
- Provide emergency egress from opposite end of repair pit plus electrical and ventilation to code - $6,500
- Provide attic access hatch and study attic condition and attic ventilation. Add ventilation and insulation to code if required - $3,500
- Fire rate the second floor and the exit from it to the exterior - $8,000
- Paint exterior door - $800
- Paint building interior - $4,000

Structural:

- The damaged concrete adjacent to the man door should be repaired - $2,500

Mechanical:

- Modify plumbing vent piping to be code compliant - $1,500
- Replace existing service pit sump pump with one rated for hazardous location including associated wiring - $5.500
- Presence of an oil interceptor and regular maintenance should be confirmed by Nalcor. If an interceptor is not present one should be installed and connected to the building floor drainage system - $18,000
- Insulate accessible domestic hot and cold water piping - $2,000
- Replace hot water tank - $1,200
- Extend hot water tank relief piping to within 300mm of floor or less providing an air break - $200
- Provide a domestic water hose reel in the service bay area - $800
- Provide a heat recovery unit to meet minimum ventilation requirements - $ 27,000
- Replace exhaust fan with one of non-spark construction and suitable for conveyance of combustible gases. Provide visual system operation proving light - $4,500
- Provide welding fume extraction exhaust system - $9,500
- Increase general exhaust rates if required and provide tempered make-up air system for general exhaust capacity and pit and welding exhaust systems - $12,000
- Upgrade gas detection system with additional sensors, visual and audible alarm indication, and interlock with exhaust and make-up air systems - $12,000
- Provide nitrogen dioxide gas detection system if diesel vehicles are serviced in the garage - $2,800

Electrical:

- All old interior and exterior lighting fixtures to be replaced. Install new photocell control for the exterior lighting - $4,300
- Service pit lighting and wiring to be replaced with suitable material for hazardous locations - $13,000
- Service pit receptacles and wiring should be removed or replaced with suitable material for hazardous locations - $5,000

Environmental:

- Stored propane and acetylene cylinders should be moved to an outdoor storage area - $100

Estimated total cost for immediate repairs and upgrades:
$149,000 sub-total cost x 10% contingency = $163,900 total cost

4.1.4.2 Mid-Term Maintenance and Repairs

The following list contains recommended renovations and repairs for completion in the next 3 to 10 years, again assuming the building will remain in operation. These repairs would progress after the items listed in the immediate repair category are complete.

Architectural:

- Replace metal siding - $20,300
- Replace roof shingles - $7,500

Electrical:

- New main disconnect and panelboard with sufficient spare capacity to be installed - $7,500
- All old receptacles and lighting switches, including the outlet boxes and faceplates to be replaced - $3,400

Estimated total cost for mid-term repairs and upgrades:
$38,700 sub-total cost x 10% contingency = $42,600 total cost

4.1.5 Storage Building

4.1.5.1 Immediate Maintenance and Repairs

The following renovations, repairs, and/or upgrades are recommended to be completed within the next two years, assuming the facility is intended to continue operations.

Architectural:

- Seal hole in door frame, replace corroded hinges, and upgrade caulking - $1,800

Electrical:

- Install exterior lighting with photocell control - $2,200

Estimated total cost for immediate repairs and upgrades:
$4,000 sub-total cost x 10% contingency = $4,400 total cost

4.1.6 Carpentry Building

4.1.6.1 Immediate Maintenance and Repairs

The following renovations, repairs, and/or upgrades are recommended to be completed within the next two years, assuming the facility is intended to continue operations.

Architectural:

- Repair and paint door and frame, replace sill - $1,000
- Provide attic hatch - $1,500

Mechanical:

- Based on the intended use of this building it should be provided with a ventilation system - $6,000

Electrical:

- Install photocell controlled building exterior lighting - $2,200
- Install one dual head emergency battery unit in the building - $900

Estimated total cost for immediate repairs and upgrades:
$11,600 sub-total cost x 10% contingency = $12,800 total cost

4.1.6.2 Mid-Term Maintenance and Repairs

The following list contains recommended renovations and repairs for completion in the next 3 to 10 years, again assuming the building will remain in operation. These repairs would progress after the items listed in the immediate repair category are complete.

Architectural:

- Replace door - $3,800
- Replace roof shingles - $4,500

Electrical:

- Install new main disconnect and main load center with sufficient spare capacity - $4,500
- Replace baseboard heaters - $2,400
- Replace all old receptacles and lighting switches, including the outlet boxes and faceplates - $2,200

Estimated total cost for mid-term repairs and upgrades:
$17,400 sub-total cost x 10% contingency = $19,100 total cost

CHAPTER 5 CAPITAL COST SUMMARY AND COMPARISON OF SCENARIOS

5.1 Capital Cost Summary

5.1.1 Table 2: Capital Cost Summary

Building/Action	Construction Costs
Main Depot Building	
Immediate (1-2 years)	$182,300
Mid-Term (3-10 years)	$200,500
Maintenance Garage	
Immediate (1-2 years)	$163,900
Mid-Term (3-10 years)	$42,600
Storage Building	
Immediate (1-2 years)	$4,400
Carpentry Building	
Immediate (1-2 years)	$12,800
Mid-Term (3-10 years)	$19,100

Costs provided in these tables do not include HST. Costs provided are in current Canadian dollars and escalation values may have to be applied to renovations in future years to account for such factors as inflation, exchange rate, and competitiveness of construction industry.

This opinion of probable costs is presented on the basis of experience, qualifications, and best judgment. It has been prepared in accordance with acceptable principles and practices. Sudden market trend changes, non-competitive bidding situations, unforeseen labour and material adjustments and the like are beyond the control of CBCL Limited. We cannot warrant or guarantee that actual costs will not vary significantly from the opinion provided.

FINAL REPORT

Issued by:



Paul Sceviour, MASc., P.Eng.
Senior Mechanical Engineer

This document was prepared for the party indicated herein. The material and information in the document reflects CBCL Limited's opinion and best judgment based on the information available at the time of preparation. Any use of this document or reliance on its content by third parties is the responsibility of the third party. CBCL Limited accepts no responsibility for any damages suffered as a result of third party use of this document.

APPENDIX A

Site Photos – Main Depot Building

APPENDIX A

ARCHITECTURAL PHOTOS

Nalcor Assessments – Whitbourne
Architectural – Main Depot Building



Photo 1



Photo 2

Nalcor Assessments – Whitbourne
Architectural – Main Depot Building



Photo 3



Photo 4

Nalcor Assessments – Whitbourne
Architectural – Main Depot Building



Photo 5



Photo 6

Nalcor Assessments – Whitbourne
Architectural – Main Depot Building



Photo 7



Photo 8

Nalcor Assessments – Whitbourne
Architectural – Main Depot Building



Photo 9



Photo 10



Photo 12



Photo 11



Photo 14



Photo 13

Nalcor Assessments – Whitbourne
Architectural – Main Depot Building



Photo 15



Photo 16

Nalcor Assessments – Whitbourne
Architectural – Main Depot Building



Photo 17



Photo 18

Nalcor Assessments – Whitbourne
Architectural – Main Depot Building



Photo 19



Photo 20



Photo 21



Photo 22

Nalcor Assessments – Whitbourne
Architectural – Main Depot Building

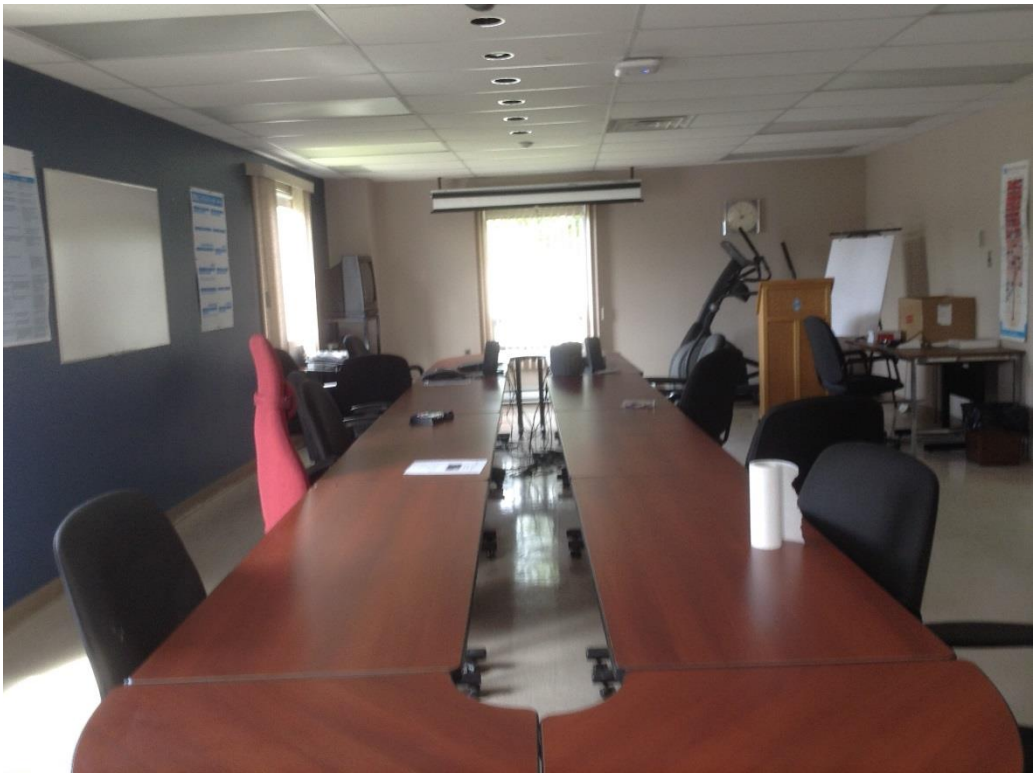


Photo 23



Photo 24



Photo 25



Photo 26

Nalcor Assessments – Whitbourne
Architectural – Main Depot Building



Photo 27



Photo 28

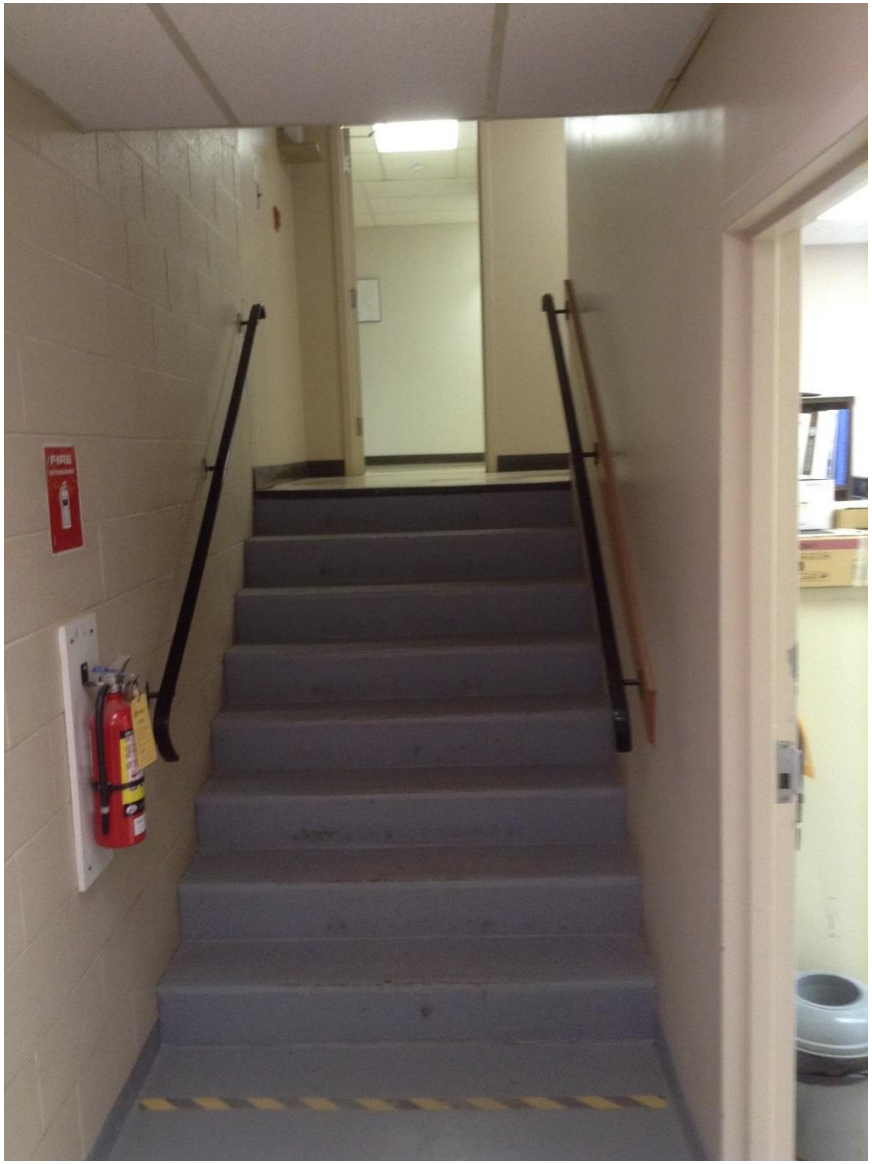


Photo 29



Photo 30



Photo 31



Photo 32



Photo 33



Photo 34



Photo 36



Photo 35



Photo 38



Photo 37



Photo 40

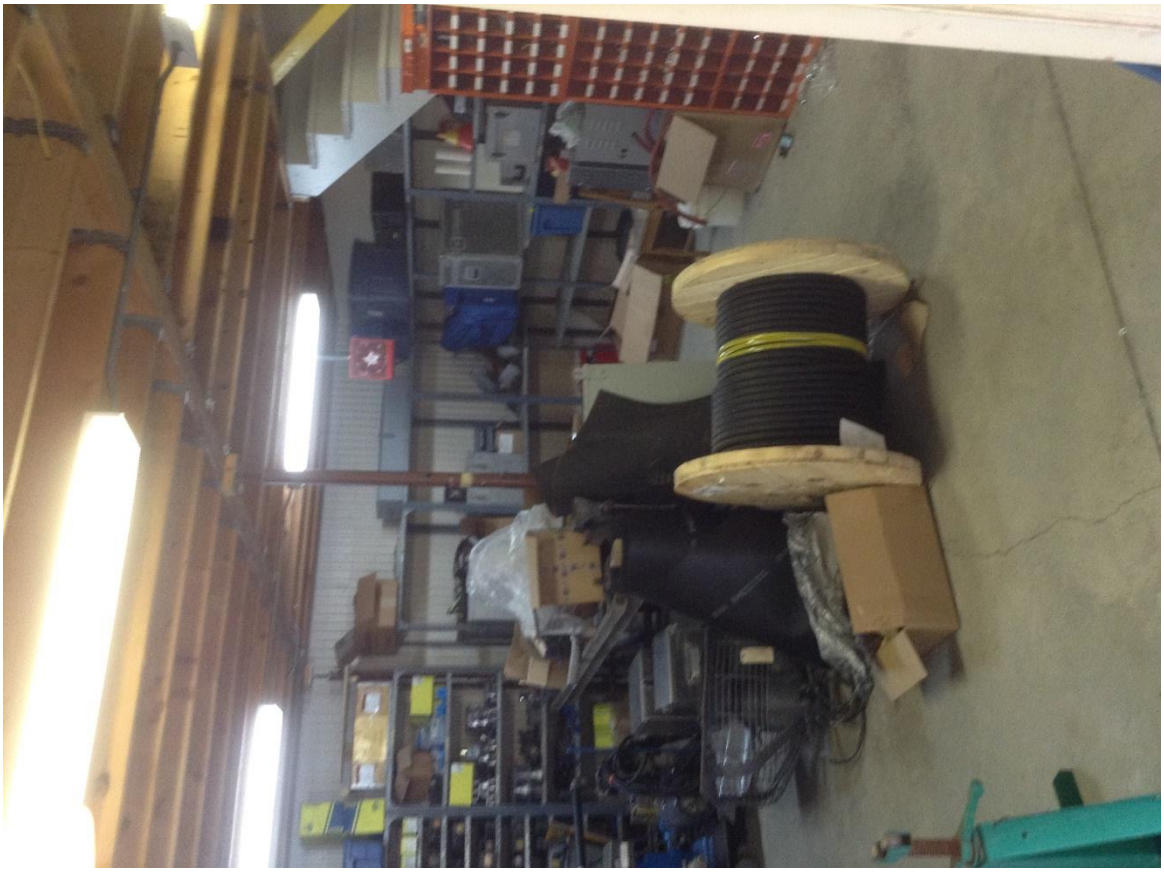


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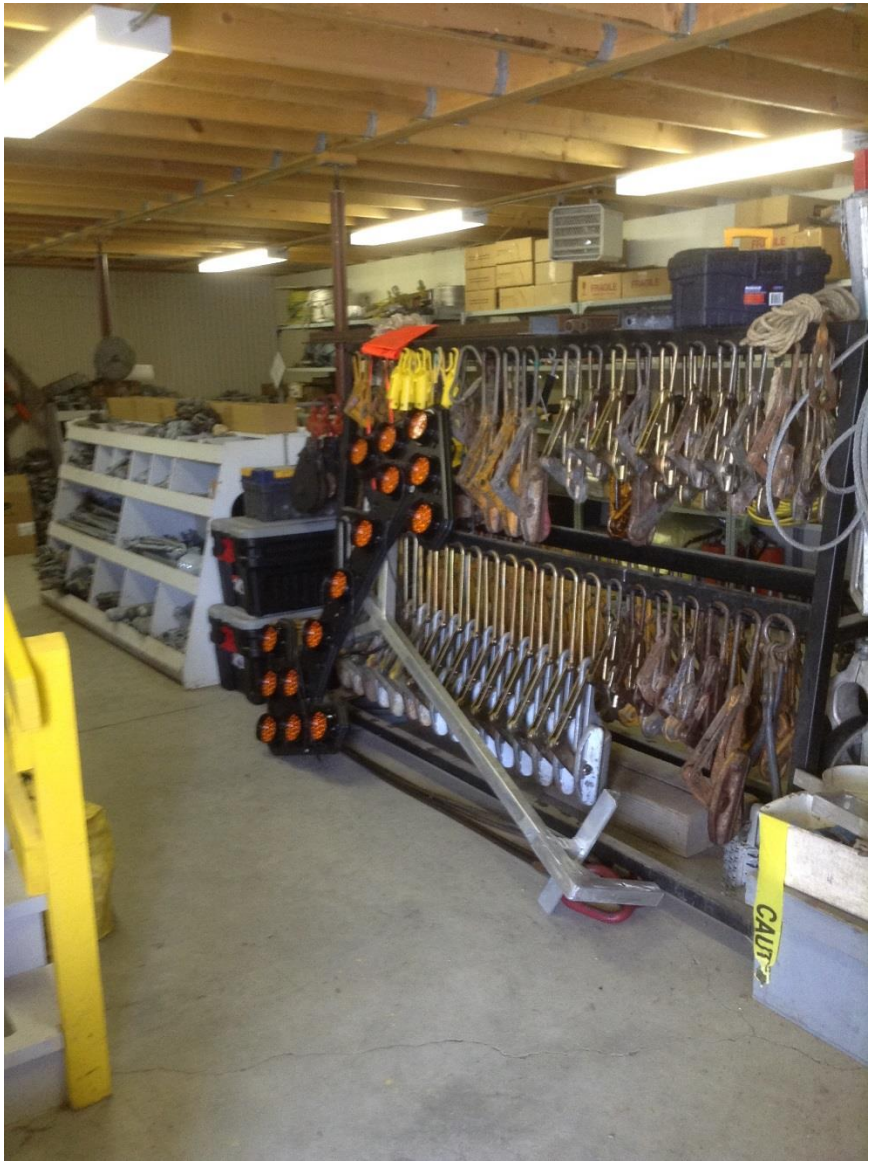


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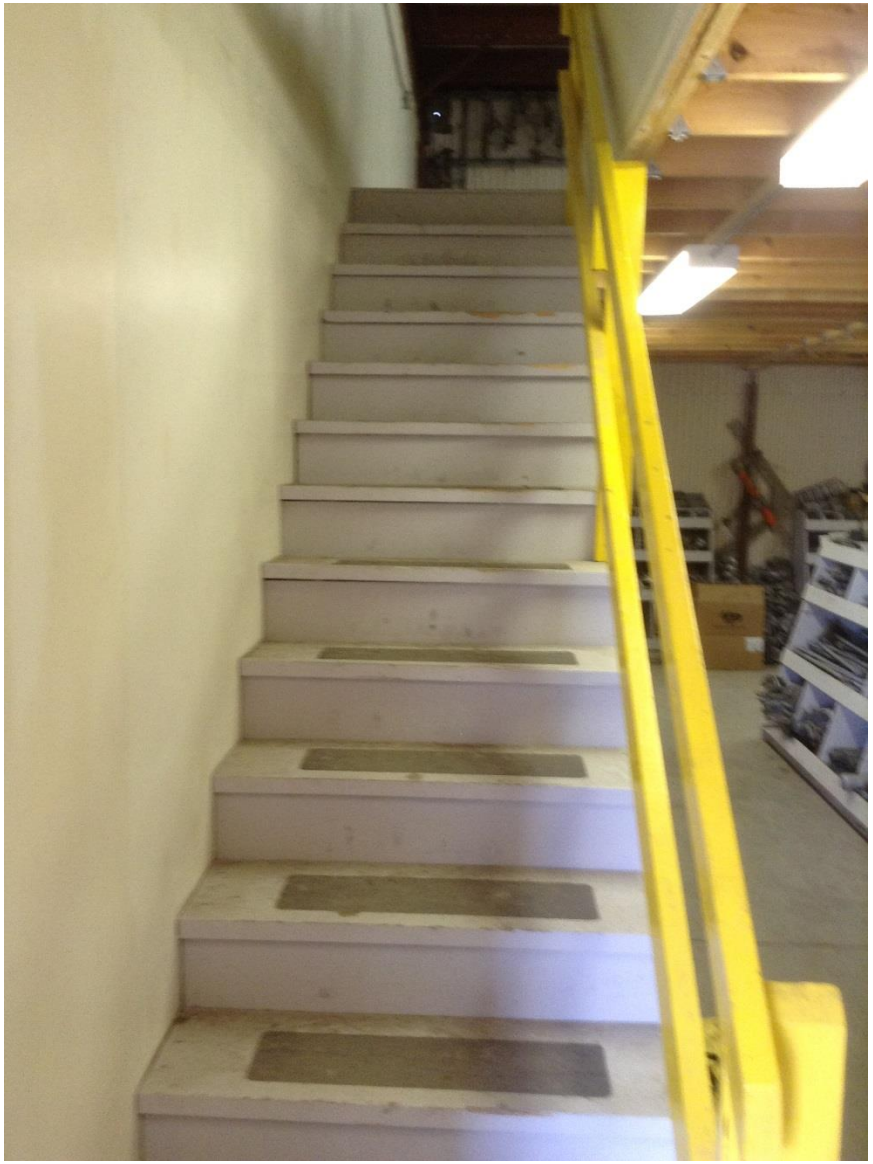


Photo 42

Nalcor Assessments – Whitbourne
Architectural – Main Depot Building



Photo 43

APPENDIX A

STRUCTURAL PHOTOS

Nalcor Assessments – Whitbourne
Structural – Main Depot Building



Photo 1 - Site Grading Towards Foundation Wall



Photo 2 - Large Horizontal Cracks in Foundation

Nalcor Assessments – Whitbourne
Structural – Main Depot Building



Photo 3 - Large Spall in Foundation



Photo 4 - Large Horizontal Crack in Foundation Wall

Nalcor Assessments – Whitbourne
Structural – Main Depot Building



Photo 5 - Shrinkage Cracks in Interior Slab (2)



Photo 6 - Shrinkage Cracks in Interior Slab

Nalcor Assessments – Whitbourne
Structural – Main Depot Building



Photo 7 - Deformation of Purlin



Photo 8 - Wind Girt Spacing and Paneling

Nalcor Assessments – Whitbourne
Structural – Main Depot Building



Photo 9 - Equipment Hung from Steel Tie Rod



Photo 10 - Second Level Floor Framing

Nalcor Assessments – Whitbourne
Structural – Main Depot Building



Photo 11 - Mezzanine in Telecontrol Room



Photo 12 - Settlement Cracks in Block Wall

Nalcor Assessments – Whitbourne
Structural – Main Depot Building



Photo 13 - Settlement Cracks in Block Wall (2)

APPENDIX A

MECHANICAL PHOTOS

Nalcor Assessments – Whitbourne
Mechanical – Main Depot Building



Photo 1 - ABS Drainage and Vent Piping



Photo 2 - ABS Drainage Piping

Nalcor Assessments – Whitbourne
Mechanical – Main Depot Building



Photo 3 - ABS Vent Piping



Photo 4 - Capped Floor Drain

Nalcor Assessments – Whitbourne
Mechanical – Main Depot Building



Photo 5 – Oil Interceptor Access Cover



Photo 6 – Stabilizing Chamber Access Cover

Nalcor Assessments – Whitbourne
Mechanical – Main Depot Building



Photo 7 - Domestic Water Pressure Tanks and Piping



Photo 8 - Domestic Water Storage

Nalcor Assessments – Whitbourne
Mechanical – Main Depot Building



Photo 9 - Well Pump Controls



Photo 10 - Uninsulated Domestic Water Piping

Nalcor Assessments – Whitbourne
Mechanical – Main Depot Building



Photo 11 - Hot Water Tank

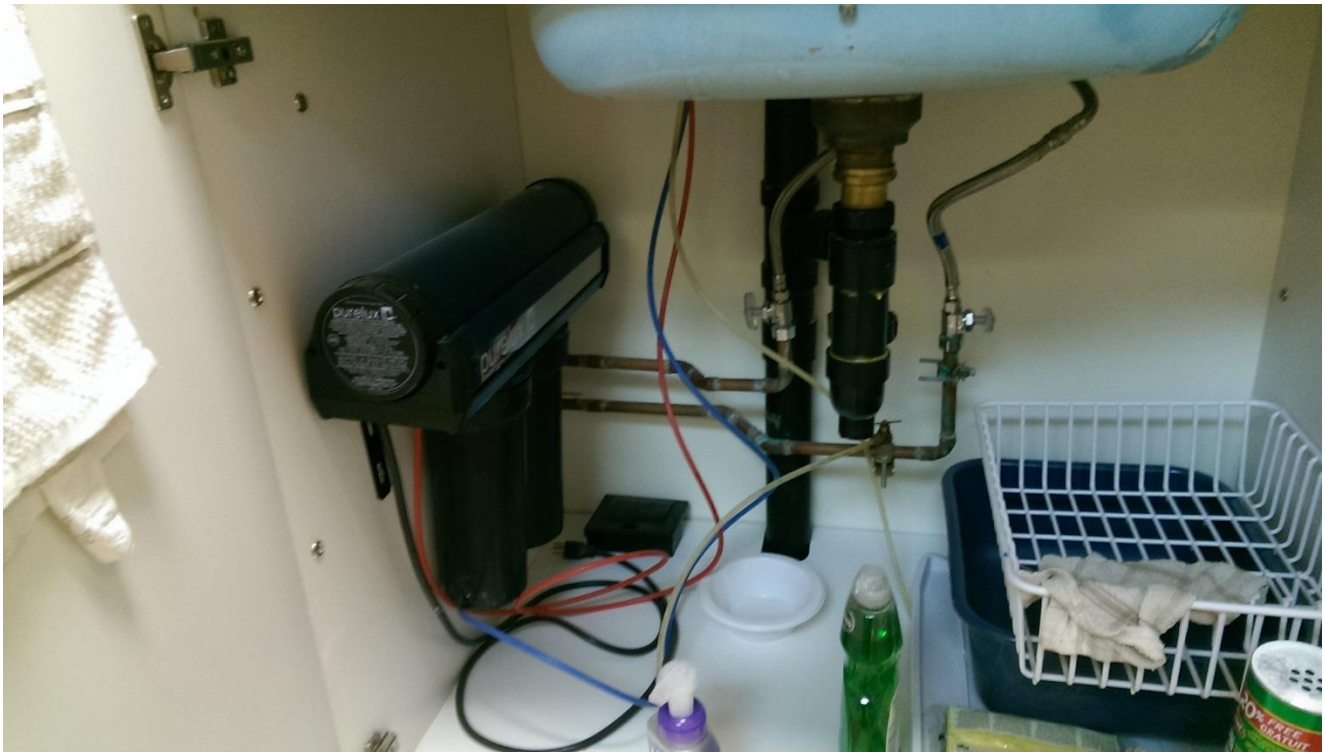


Photo 12 - Lunch Room Sink Water Filtration System



Photo 13 - Water Closet



Photo 14 - Urinal

Nalcor Assessments – Whitbourne
Mechanical – Main Depot Building



Photo 15 - Lavatory



Photo 16 - Wall Mounted Lavatory

Nalcor Assessments – Whitbourne
Mechanical – Main Depot Building



Photo 17 - Lunch Room Sink



Photo 18 - Eyewash Unit

Nalcor Assessments – Whitbourne
Mechanical – Main Depot Building



Photo 19 - AC Condenser and Air Intake and Exhaust Hood

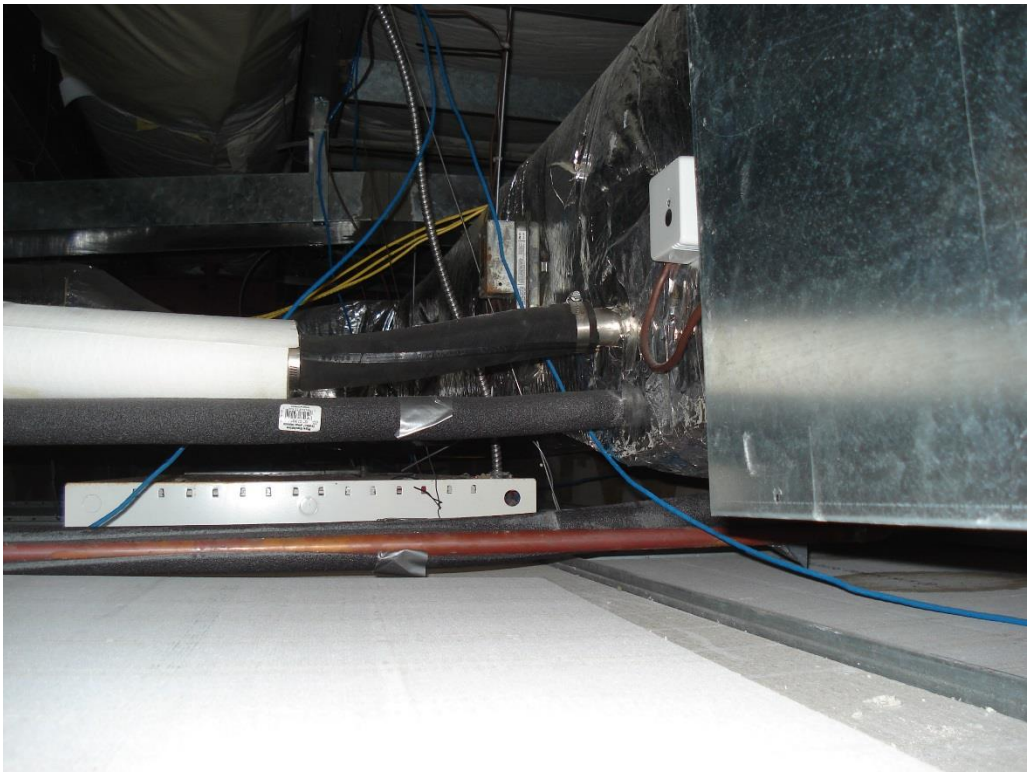


Photo 20 - Indoor Unit

Nalcor Assessments – Whitbourne
Mechanical – Main Depot Building



Photo 21 - Typical Bypass Terminal Unit



Photo 22 - Main System Controller

Nalcor Assessments – Whitbourne
Mechanical – Main Depot Building



Photo 23 - Humidifier



Photo 24 - Range Hood

Nalcor Assessments – Whitbourne
Mechanical – Main Depot Building



Photo 25 - Washroom Exhaust Fan



Photo 26 – Office Area Zone Thermostat

APPENDIX A

ELECTRICAL PHOTOS

Nalcor Assessments – Whitbourne
Electrical – Main Depot Building



Photo 1



Photo 2

Nalcor Assessments – Whitbourne
Electrical – Main Depot Building



Photo 3



Photo 4

Nalcor Assessments – Whitbourne
Electrical – Main Depot Building



Photo 5



Photo 6

Nalcor Assessments – Whitbourne
Electrical – Main Depot Building



Photo 7



Photo 8

Nalcor Assessments – Whitbourne
Electrical – Main Depot Building



Photo 9



Photo 10

Nalcor Assessments – Whitbourne
Electrical – Main Depot Building



Photo 11



Photo 12

Nalcor Assessments – Whitbourne
Electrical – Main Depot Building

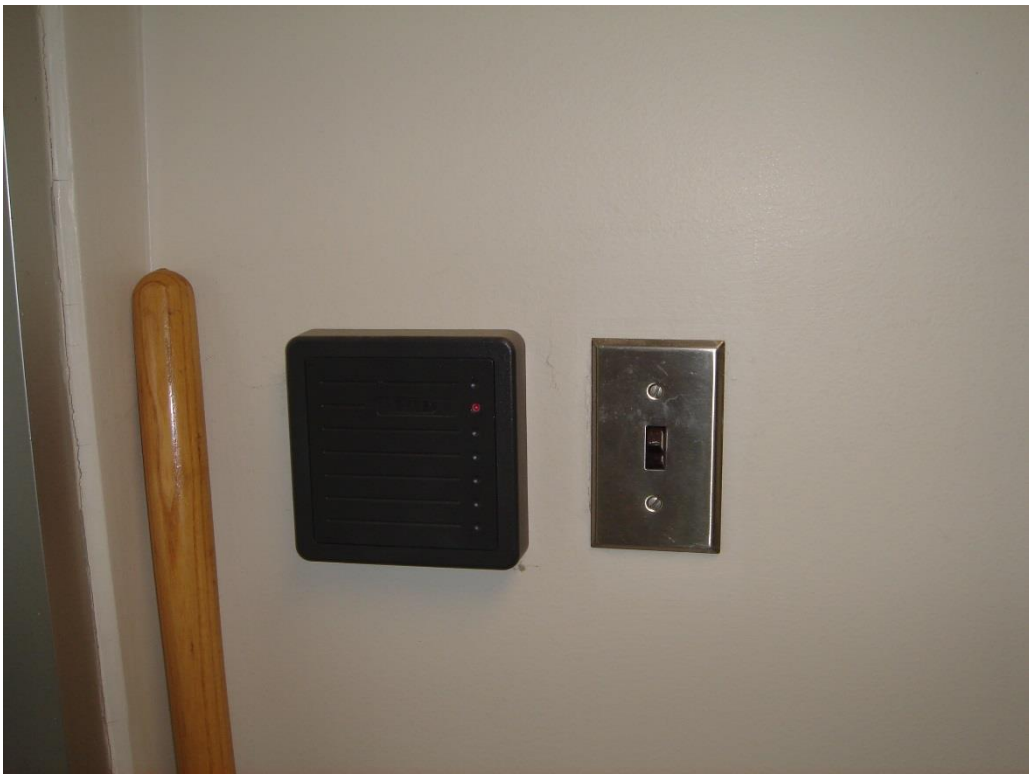


Photo 13

APPENDIX B

Site Photos – Maintenance Garage

APPENDIX B

ARCHITECTURAL PHOTOS

Nalcor Assessments – Whitbourne
Architectural – Maintenance Garage



Photo 1



Photo 2

Nalcor Assessments – Whitbourne
Architectural – Maintenance Garage



Photo 3



Photo 4

Nalcor Assessments – Whitbourne
Architectural – Maintenance Garage



Photo 5



Photo 6





Photo 8

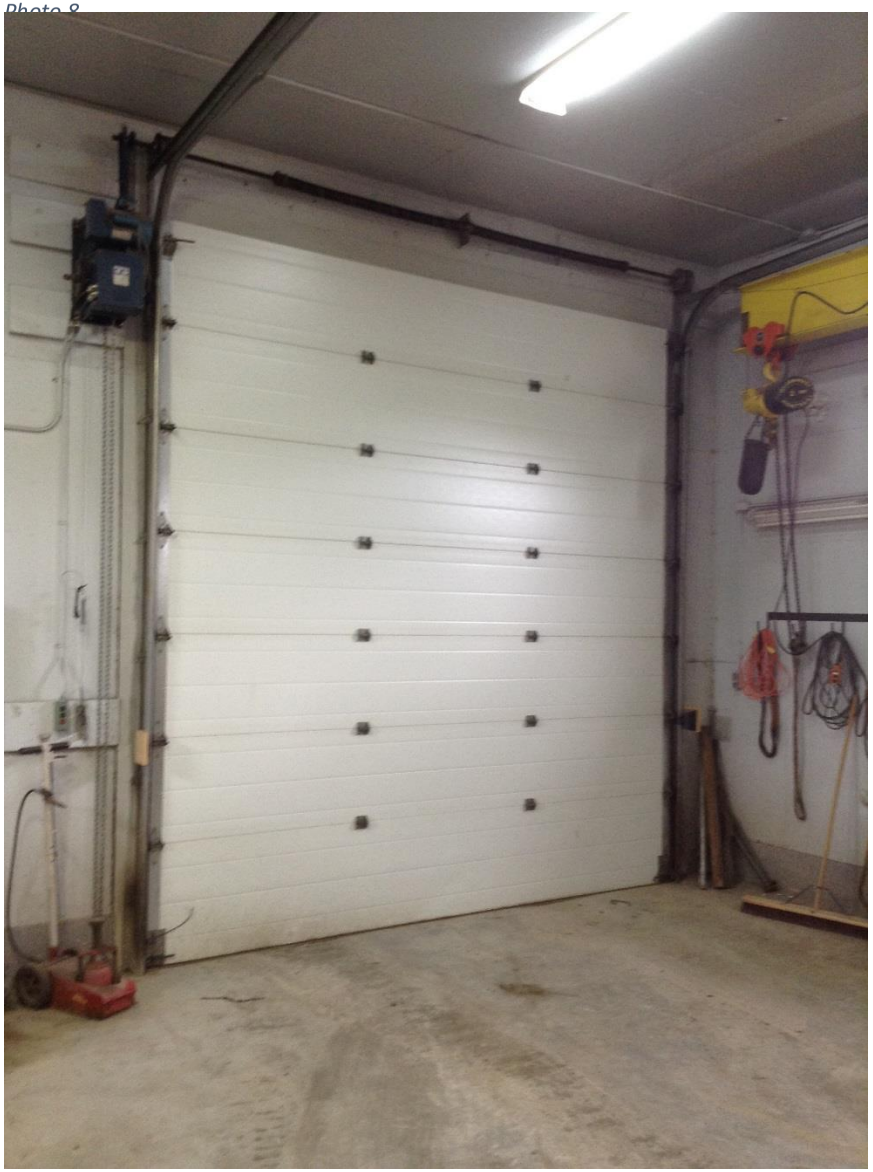


Photo 9

Photo 7



Photo 10

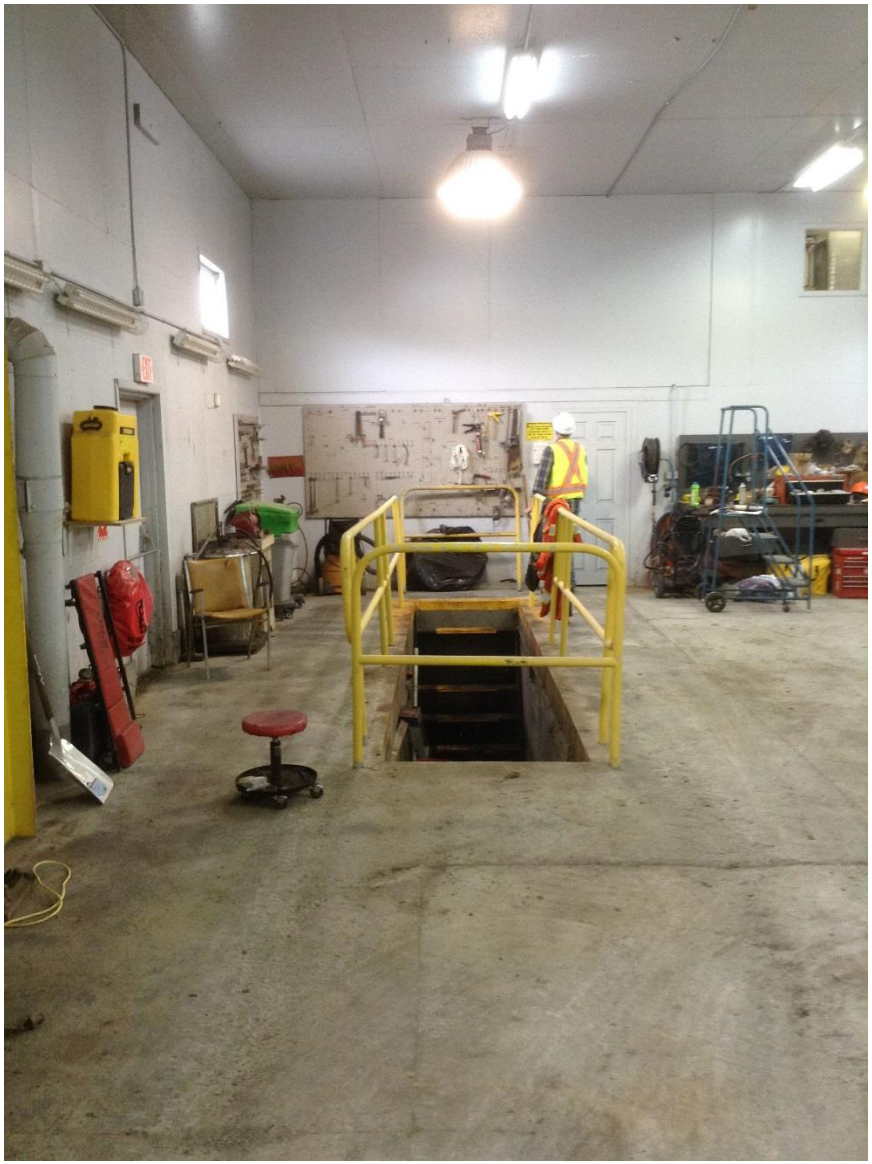


Photo 11

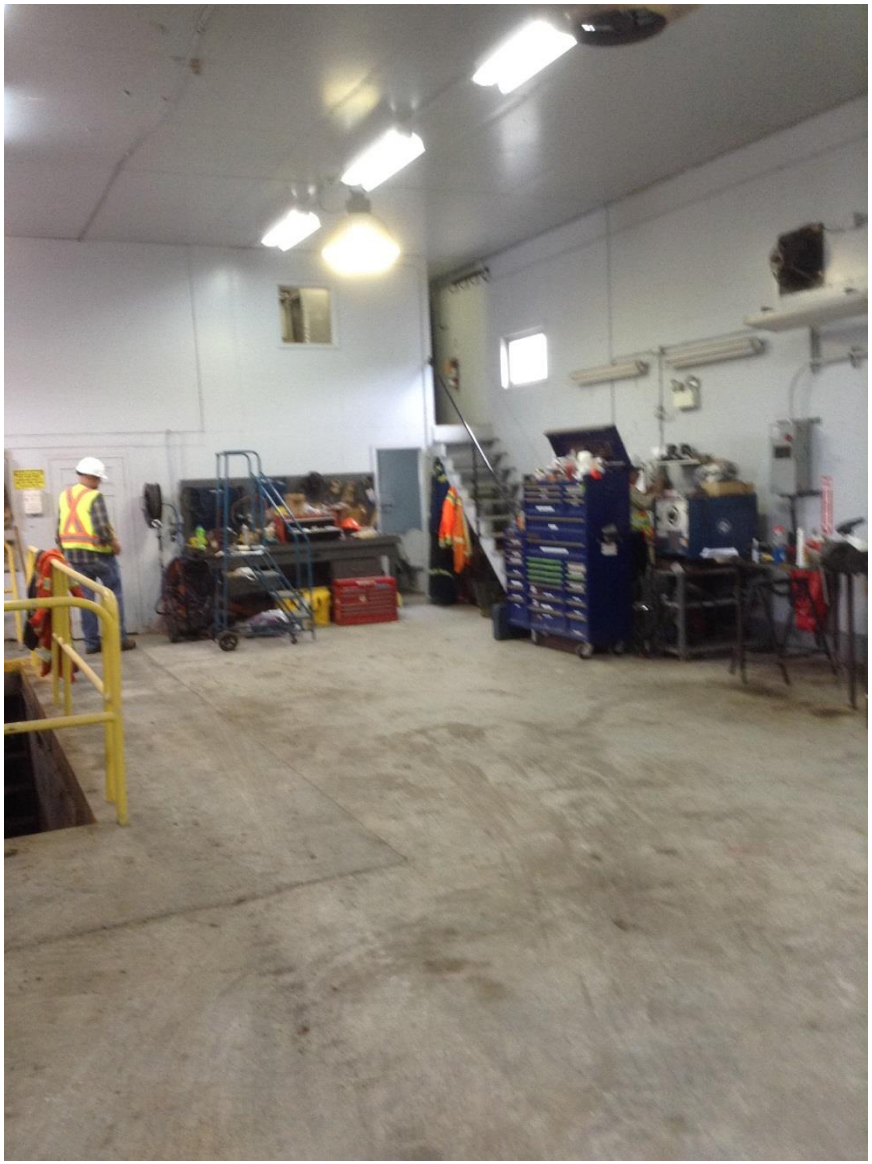


Photo 12



Photo 14



Photo 13

Nalcor Assessments – Whitbourne
Architectural – Maintenance Garage



Photo 15

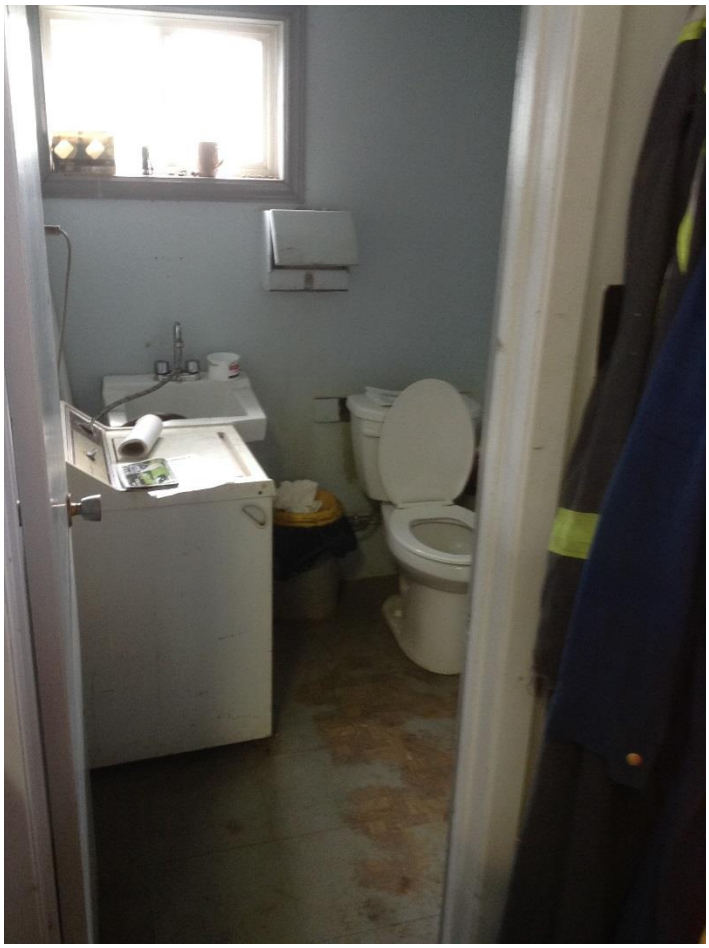


Photo 16



Photo 17



Photo 18

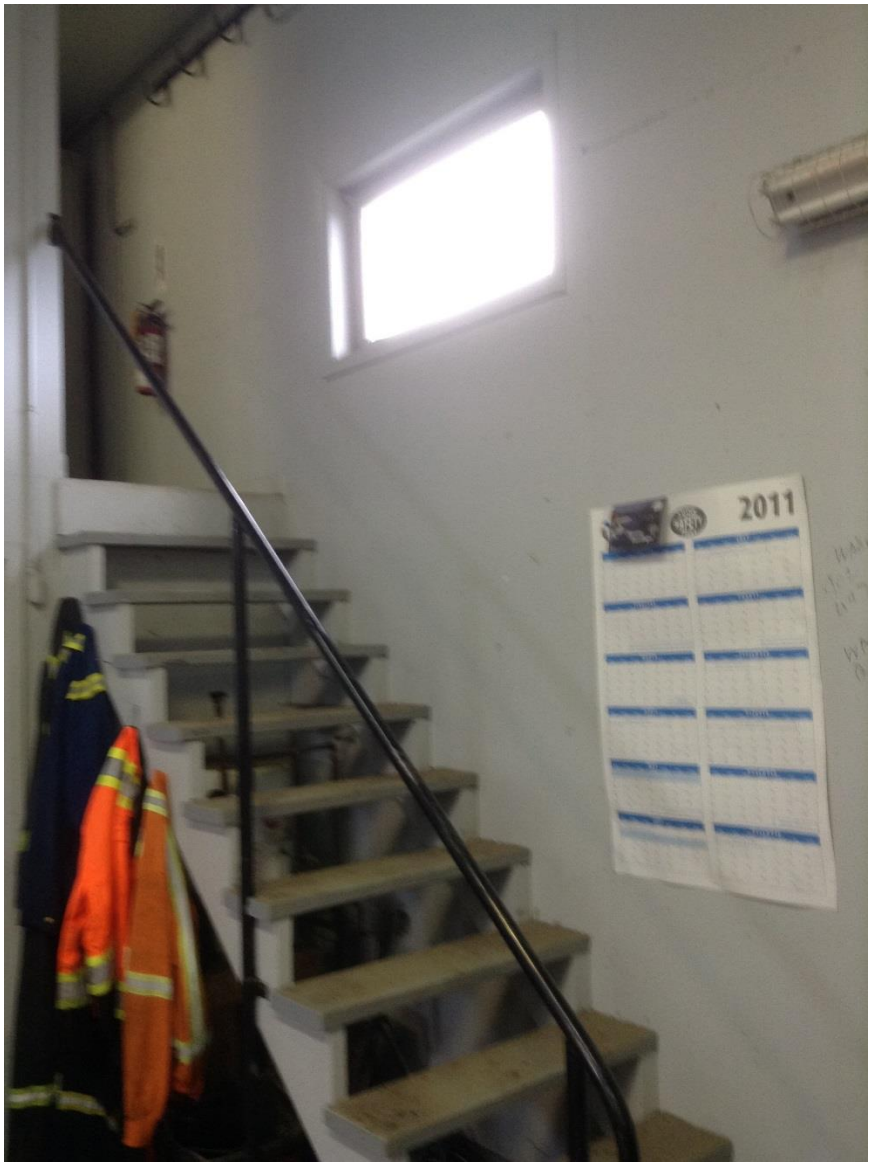


Photo 19



Photo 20

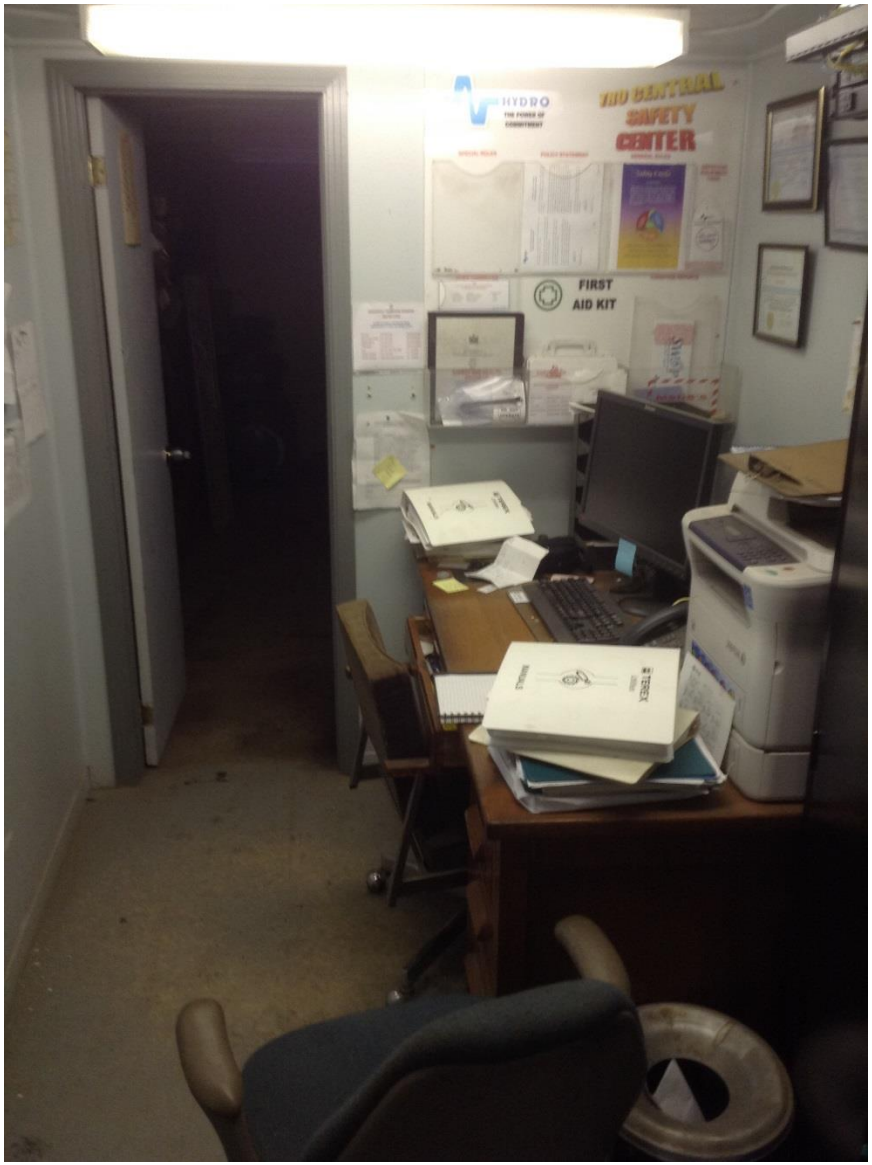


Photo 21



Photo 22

Nalcor Assessments – Whitbourne
Architectural – Maintenance Garage



Photo 23

APPENDIX B

STRUCTURAL PHOTOS

Nalcor Assessments – Whitbourne
Structural – Maintenance Garage



Photo 1 - Small Vertical Crack in Foundation Wall



Photo 2 - Concrete Spall on Foundation Wall

Nalcor Assessments – Whitbourne
Structural – Maintenance Garage



Photo 3 - Interior of Maintenance Garage



Photo 4 - Shrinkage Crack in Garage Interior Slab

Nalcor Assessments – Whitbourne
Structural – Maintenance Garage



Photo 5 - Moisture or Staining by Equipment

APPENDIX B

MECHANICAL PHOTOS

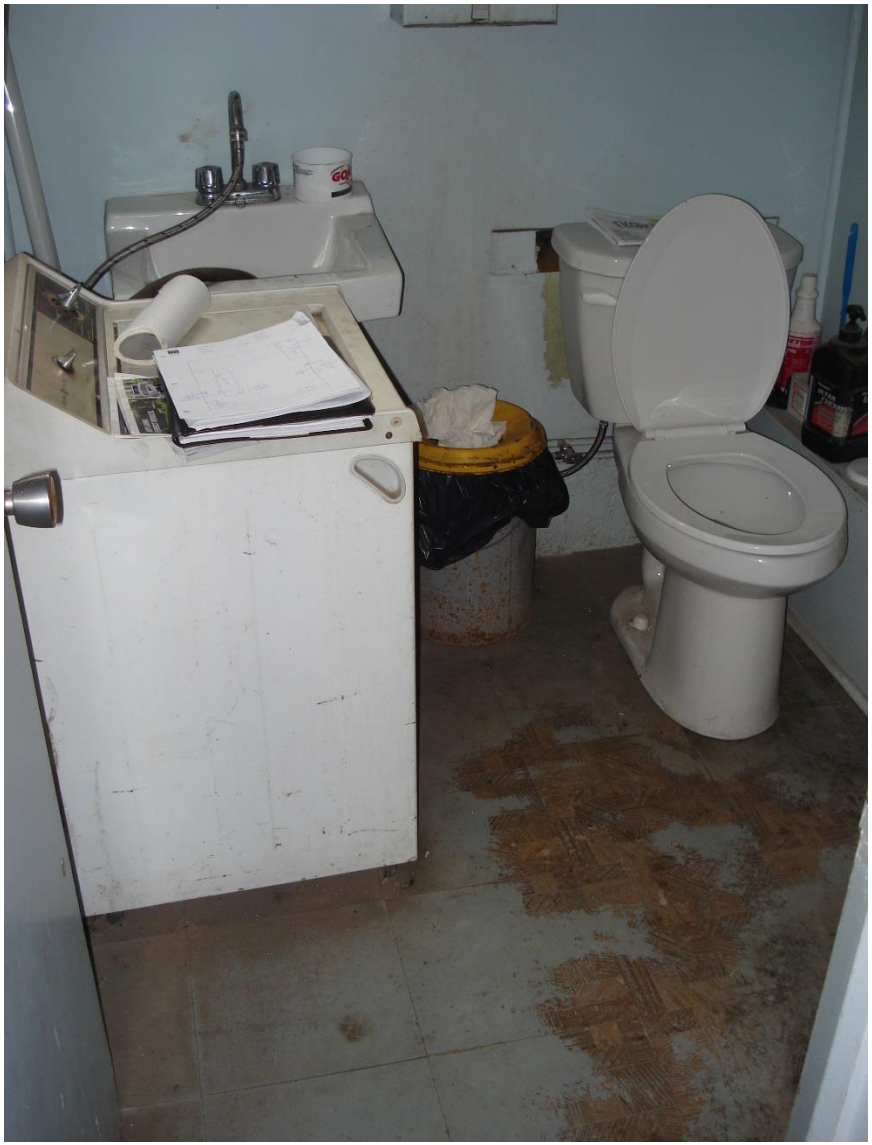


Photo 1 - Washroom Fixtures



Photo 2 - Service Sink

Nalcor Assessments – Whitbourne
Mechanical – Maintenance Garage



Photo 3 - Non Code Compliant Vent Piping



Photo 4 - Service Pit Sump Pump

Nalcor Assessments – Whitbourne
Mechanical – Maintenance Garage



Photo 5 - Hot Water Tank



Photo 6 - Garage Exhaust Fan Hood

Nalcor Assessments – Whitbourne
Mechanical – Maintenance Garage



Photo 7 - Service Pit Sidewall Exhaust Fan



Photo 8 - Service Pit Exhaust Duct

Nalcor Assessments – Whitbourne
Mechanical – Maintenance Garage



Photo 9 - CO Gas Detection System

APPENDIX B

ELECTRICAL PHOTOS

Nalcor Assessments – Whitbourne
Electrical – Maintenance Garage



Photo 1



Photo 2

Nalcor Assessments – Whitbourne
Electrical – Maintenance Garage



Photo 3



Photo 4

Nalcor Assessments – Whitbourne
Electrical – Maintenance Garage



Photo 5



Photo 6

Nalcor Assessments – Whitbourne
Electrical – Maintenance Garage



Photo 7

APPENDIX C

Site Photos – Storage Building

APPENDIX C

ARCHITECTURAL PHOTOS

Nalcor Assessments – Whitbourne
Architectural – Storage Building



Photo 1



Photo 2

Nalcor Assessments – Whitbourne
Architectural – Storage Building



Photo 4



Photo 3

Nalcor Assessments – Whitbourne
Architectural – Storage Building



Photo 5



Photo 6

Nalcor Assessments – Whitbourne
Architectural – Storage Building

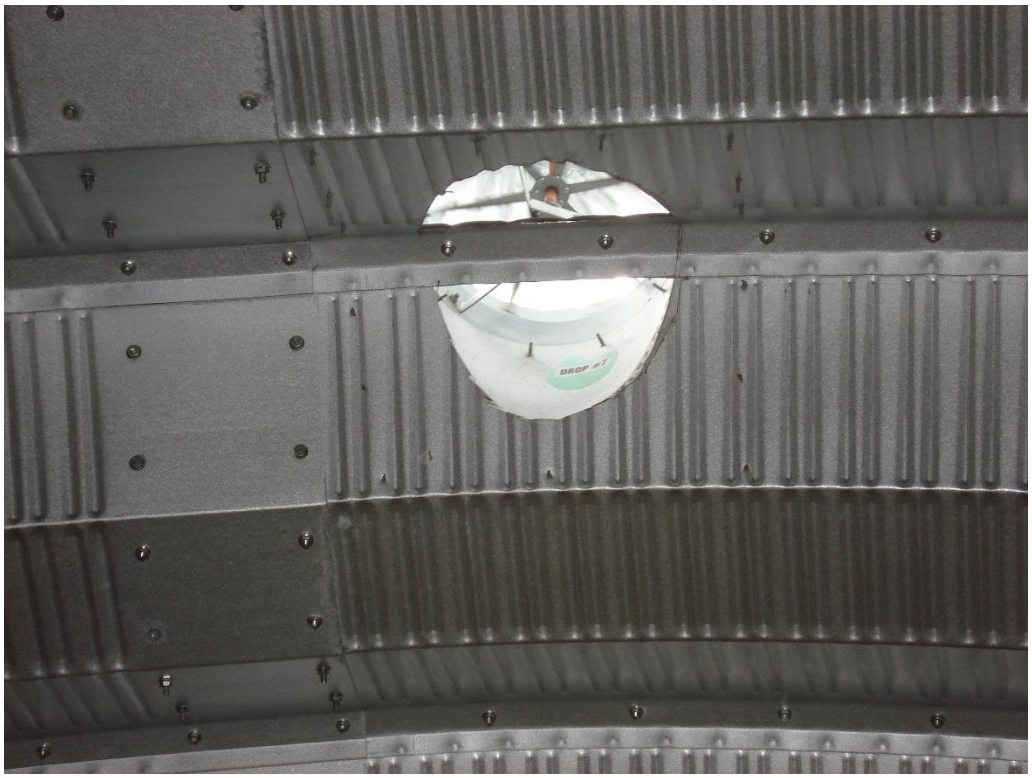


Photo 7

APPENDIX C

STRUCTURAL PHOTOS

Nalcor Assessments – Whitbourne
Structural – Storage Building

3



Photo 1 - Quonset Hut Structure



Photo 2 - Floor Shrinkage Cracks

Nalcor Assessments – Whitbourne
Structural – Storage Building



Photo 3 - Interior Structure

APPENDIX C

ELECTRICAL PHOTOS

Nalcor Assessments – Whitbourne
Electrical – Storage Building



Picture 1



Picture 2

Nalcor Assessments – Whitbourne
Electrical – Storage Building



Picture 3



Picture 4

APPENDIX D

Site Photos – Carpentry Building

APPENDIX D

ARCHITECTURAL PHOTOS

Nalcor Assessments – Whitbourne
Architectural – Carpentry Building



Photo 1



Photo 2

Nalcor Assessments – Whitbourne
Architectural – Carpentry Building



Photo 3



Photo 4

Nalcor Assessments – Whitbourne
Architectural – Carpentry Building



Photo 5



Photo 6

Nalcor Assessments – Whitbourne
Architectural – Carpentry Building



Photo 7



Photo 8

Nalcor Assessments – Whitbourne
Architectural – Carpentry Building

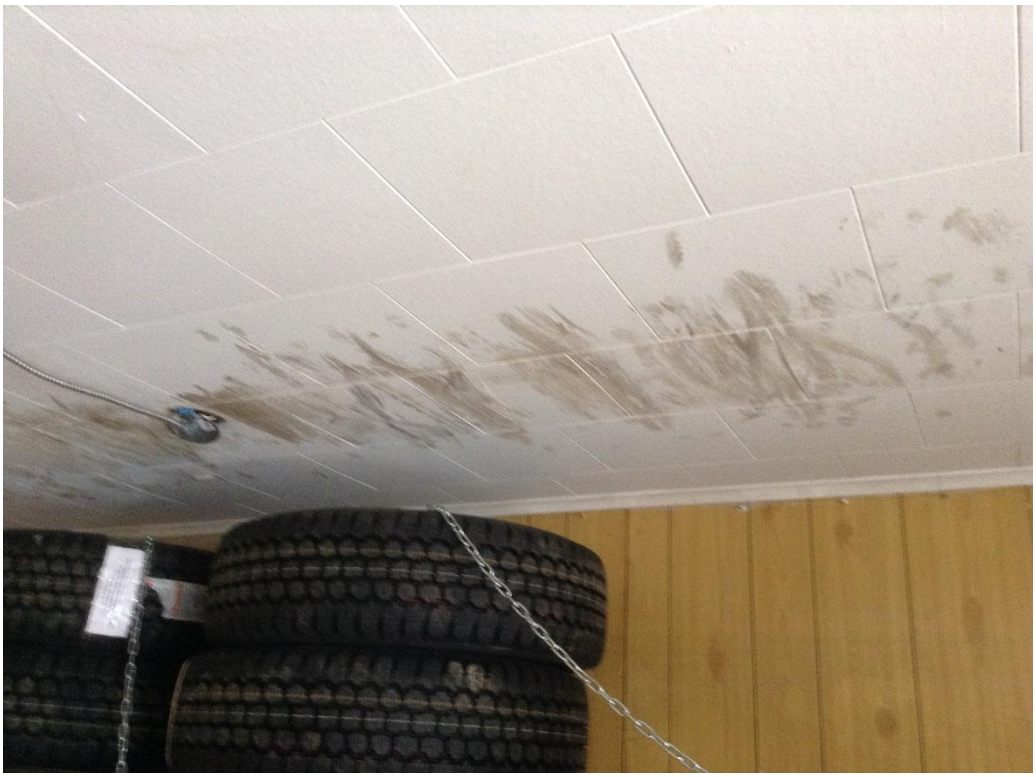


Photo 9

APPENDIX D

STRUCTURAL PHOTOS

Nalcor Assessments – Whitbourne
Structural – Carpentry Building



Photo 1 - Skirting Along Bottom of Building



Photo 2 - Marks Made by Tires on Ceiling

APPENDIX D

ELECTRICAL PHOTOS

Nalcor Assessments – Whitbourne
Electrical – Carpentry Building



Photo 1



Photo 2

Nalcor Assessments – Whitbourne
Electrical – Carpentry Building



Photo 3



Photo 4

APPENDIX E

Site Photos – Site/Civil

Nalcor Assessments – Whitbourne
Civil – Site Civil Photos



Photo 1 - Office Entrance



Photo 2 - Front Parking Area

Nalcor Assessments – Whitbourne
Civil – Site Civil Photos



Photo 3 - Yard South of Main Building



Photo 4 - Office Leg of Building

Nalcor Assessments – Whitbourne
Civil – Site Civil Photos



Photo 5 - East End of Main Building



Photo 6 - Rear of Main Building

Nalcor Assessments – Whitbourne
Civil – Site Civil Photos



Photo 7 - Maintenance Garage



Photo 8 - Path of Storm Drainage



Photo 9 – Fencing Off From Bottom



Photo 10 – Fence Leaning



Photo 11 – Barbed Wire Support Off



Photo 12 - Fence Leaning



Photo 13Pole Split and Brace Off



Photo 14 - Braces Bent and Off

Nalcor Assessments – Whitbourne
Civil – Site Civil Photos



Photo 15 - Brace Fitting Broken



Photo 16 - Fence Leaning and Off From Bottom



Photo 17 - Barbed Wire Supports Off



Photo 18 - Top Brace Bent and Fence Leaning

Nalcor Assessments – Whitbourne
Civil – Site Civil Photos



Photo 19 - Barbed Wire Supports Off

APPENDIX F

Site Photos – Environmental

Nalcor Assessments – Whitbourne
Environmental Photos



Photo 1 – Stained Floor



Photo 2 – Stained Ground

Nalcor Assessments – Whitbourne
Environmental Photos



Photo 3 – Stained Ground



Photo 4 – Warehouse Safety Cabinets



Photo 5 – Warehouse Safety Cabinet Contents



Photo 6 - Aerosol Spray Paint in Safety Cabinet

Nalcor Assessments – Whitbourne
Environmental Photos



Photo 7 - Aerosol Primers and Cleaners



Photo 8 - Warehouse Extension Safety Cabinets



Photo 9 - Warehouse Extension Safety Cabinet Contents



Photo 10 - Warehouse Extension Safety Cabinet Contents

Nalcor Assessments – Whitbourne
Environmental Photos



Photo 11 - Warehouse Extension Safety Cabinet Contents



Photo 12 - Compressor Oil

Nalcor Assessments – Whitbourne
Environmental Photos

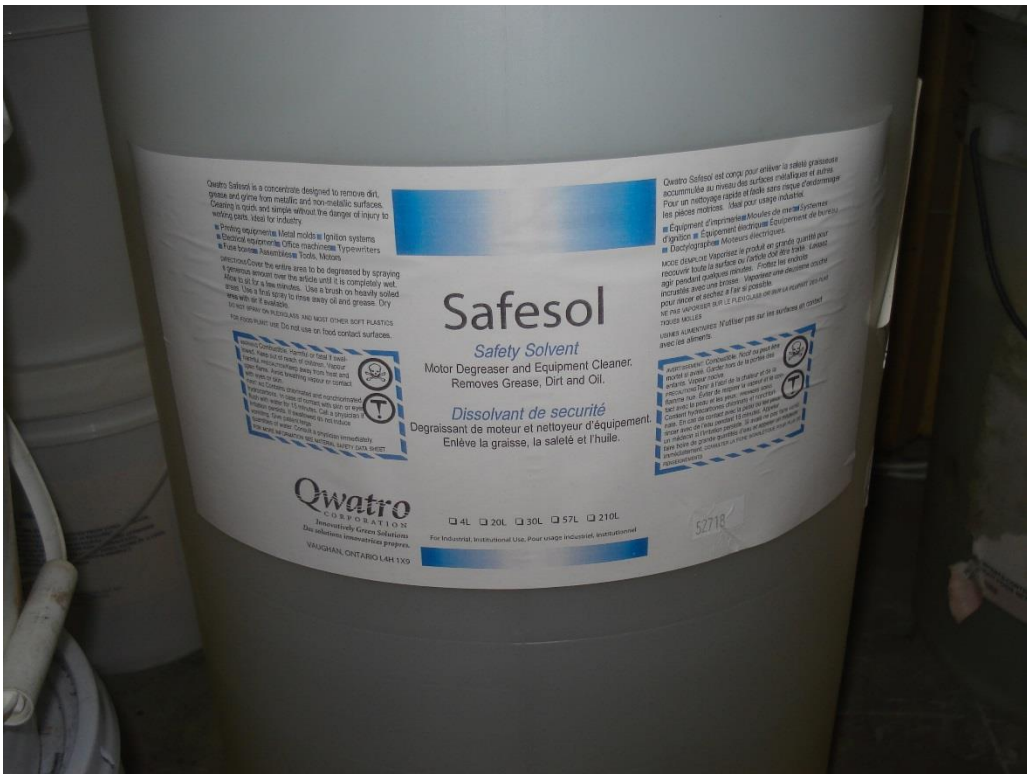


Photo 13 - Degreaser



Photo 14 - Transformer Oil

Nalcor Assessments – Whitbourne
Environmental Photos



Photo 15 - Transformer Oil



Photo 16 - Transformer Oil

Nalcor Assessments – Whitbourne
Environmental Photos



Photo 17 - Aviation Fuel Drums



Photo 18 - Propane Cylinders

Nalcor Assessments – Whitbourne
Environmental Photos



Photo 19 - Propane BBQ with Cylinder



Photo 20 - Nitrogen Cylinder

Nalcor Assessments – Whitbourne
Environmental Photos



Photo 21 - Sulfur Hexafloride Cylinder



Photo 22 - Sulfur Hexafloride

Nalcor Assessments – Whitbourne
Environmental Photos

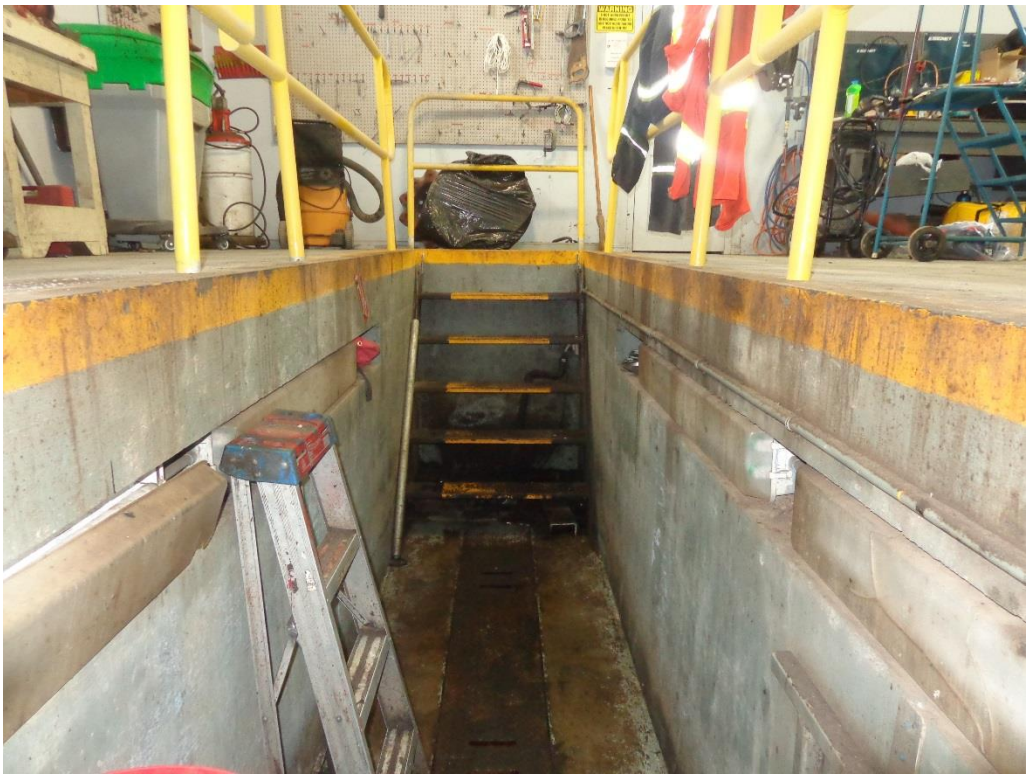


Photo 23 - Service Pit Staining

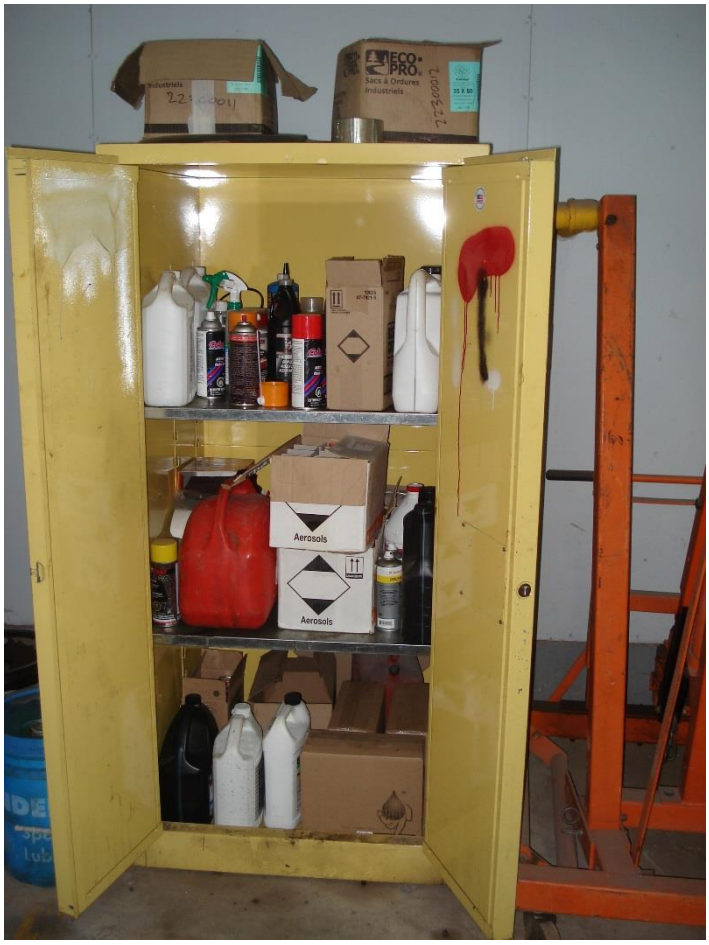


Photo 24 - Safety Cabinet Contents

Nalcor Assessments – Whitbourne
Environmental Photos



Photo 25 - Oil Containers



Photo 26 - Oil Container



Photo 27 - Waste Oil Receptacle

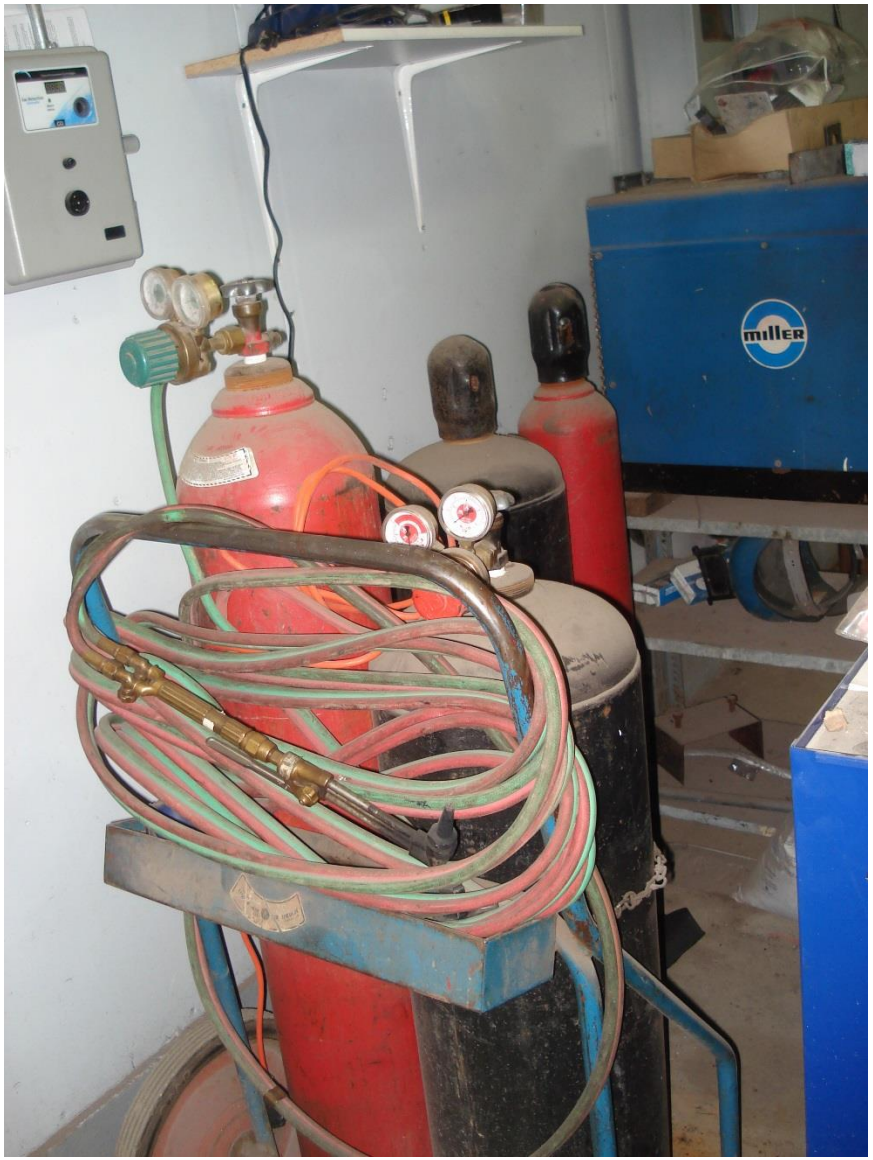


Photo 28 - Oxy-Acetylene Torch



Photo 29 - Small Gasoline Can



Photo 30 - Staining on Floor

Nalcor Assessments – Whitbourne
Environmental Photos



Photo 31



Photo 32 - Safety Cabinet Contents

Nalcor Assessments – Whitbourne
Environmental Photos



Photo 33 - Diesel Fuel Containers



Photo 34 - Insulator Coating

APPENDIX G

Existing Floor Plans

DOOR SCHEDULE

ITEM NO.	LOCATION FROM	LOCATION TO	QTY	HAND	FRAMES GAUGE	FRAMES TYPE	FRAMES DEPTH	FRAMES DETAILS HEAD	FRAMES DETAILS SILL	FRAMES DETAILS JAMB	DOORS MARK	DOORS TYPE	DOOR OPENING WIDTH	DOOR OPENING HEIGHT	HARDWARE HINGES	HARDWARE LOCK	HARDWARE CLOSER	HARDWARE DOOR STOP	HARDWARE PUSH PLATE	HARDWARE KICK PLATE	REMARKS
1	EXTERIOR	ENTRANCE	2	RHR/LHR	16		*				A	—	3'-0"	7'-0"	PIVOT	CL	TOP	—	—	—	ALUMINIUM ENTRANCE UNIT WEATHERSTRIPPED - SAFETY GLAZED
1	ENTRANCE	VESTIBULE	2	RHR/LHR	16		*				A	—	3'-0"	7'-0"	PIVOT	CL	TOP	—	—	—	ALUMINIUM ENTRANCE UNIT SAFETY GLAZED
1	HALL	TRANSMISSION	1	RH	16	PS	5¾"				D	WOOD	2'-8"	6'-8"	1½PR BB	OL	—	✓	—	—	
1	HALL	OFFICE SUPPLIES	1	LH	16	PS	5¾				D	"	"	"	"	SL	—	✓	—	—	DOOR TO BE SOLID CORE WITH 12"x18" GRILLE
2	HALL	LIBRARY	1	RH	16	PS	5¾				D	"	"	"	"	OL	—	✓	—	—	
1	HALL	PROT & COMM	1	RH	16	PS	5¾				D	"	"	"	"	OL	—	✓	—	—	
1	HALL	LUNCH ROOM	1	LH	16	PS	5¾				D	"	"	"	"	PL	—	✓	—	—	WITH 12"X18" GRILLE
1	HALL	TERMINALS	1	RH	16	PS	5¾				D	"	"	"	"	OL	—	✓	—	—	
2	HALL	JANITOR	1	LH	16	PS	5¾				D	"	"	"	"	SL	—	✓	—	—	DOOR TO BE UNDERCUT ½"
9	HALL	FEMALE WASH ROOM	1	LH	16	PS	5¾				D	"	"	"	"	BL	✓	✓	✓	✓	PLATES BOTH SIDES, SOLID CORE WITH 12" x 18" GRILLE
1	HALL	MALE WASHROOM	1	LH	16	PS	5¾				D	"	"	"	"	BL	✓	✓	✓	✓	
2	CORRIDOR	HALL	1	LHR	16	PS	5¾				C	"	"	"	"	PL	✓	—	✓	✓	
5	EXTERIOR	HALL	1	LHR	16	PS	*				C	1HM	3'-0"	7'-0"	"	ML	✓	—	—	—	PANIC EXIT DEVICE
5	CORRIDOR	PROT & COMM SHOP OFF	1	RH	16	PS	5¾				D	WOOD	2'-8"	6'-8"	"	OL	—	✓	—	—	
3	CORRIDOR	SHOP WASHROOM	1	RH	16	PS	5¾				D	"	"	"	"	BL	✓	✓	✓	✓	PLATES BOTH SIDES, SOLID CORE WITH 12" x 18" GRILLE
5	CORRIDOR	TERM SHOP OFFICE	1	RH	16	PS	5¾				D	"	"	"	"	OL	—	✓	—	—	
7	CORRIDOR	TRANS SHOP OFFICE	1	RH	16	PS	5¾				D	"	"	"	"	OL	—	✓	—	—	
9	CORRIDOR	TOOLS	1	RH	16	PS	5¾				D	HM	"	"	"	SL	—	✓	—	—	DUTCH DOOR SEE DETAIL DWG NO D-3161
8	CORRIDOR	WAREHOUSE OFFICE	1	LH	16	PS	5¾				D	WOOD	"	"	"	OL	—	✓	—	—	
0	WAREHOUSE OFFICE	WAREHOUSE	1	LH	16	PS	4"				D	1HM	"	"	"	SL	—	✓	—	—	WEATHER STRIP ALL AROUND
1	CORRIDOR	WAREHOUSE	1	RH	16	PS	4"				D	HM	"	"	"	SL	—	—	—	—	DUTCH DOOR SEE DETAIL
8	EXTERIOR	WAREHOUSE	1	—	—	S	*				B	O/H	10'-0"	12'-0"	—	NL	—	—	—	—	
3	EXTERIOR	WAREHOUSE	1	LH	16	PS	*				D	HM	3'-0"	7'-0"	1½PR BB	EL	✓	—	—	—	WEATHER STRIP ALL AROUND
4	EXTERIOR	TRANS SHOP	1	RH	16	PS	*				C	1HM	3'-0"	7'-0"	"	EL	✓	—	—	—	WEATHER STRIP ALL AROUND
5	EXTERIOR	TRANS SHOP	1	—	-	S	*				B	O/H	10'-0"	12'-0"	—	NL	—	—	—	—	
6	EXTERIOR	TERMINALS SHOP	1	RH	16	PS	*				C	HM	3'-0"	7'-0"	1½PR BB	EL	✓	—	—	—	WEATHER STRIP ALL AROUND
7	EXTERIOR	TERMINALS SHOP	1	—	—	S	*				B	O/H	10'-0"	12'-0"	—	NL	—	—	—	—	
8	EXTERIOR	COMM SHOP	1	—	-	S	*				B	O/H	10'-0"	12'-0"	—	NL	—	—	—	—	
9	EXTERIOR	COMM SHOP	1	LH	16	PS	*				C	1HM	3'-0"	7'-0"	1½PR BB	EL	✓	—	—	—	WEATHER STRIP ALL AROUND
0	CORRIDOR	TRANS SHOP	1	RH	16	PS	4"				C	1HM	2'-8"	6'-8"	"	OL	—	—	—	—	
2	CORRIDOR	TERMINALS SHOP	1	RH	16	PS	4"				C	1HM	"	"	"	OL	—	—	—	—	
0	CORRIDOR	COMM SHOP	1	LH	16	PS	4"				C	1HM	*	"	"	OL	—	—	—	—	
3	GENERAL OFFICE	CONFERENCE RM	1	RH	16	PS	7'0"				D	WOOD	"	"	"	OL	—	✓	—	—	DOOR TO BE SOLID CORE
4	TELEPHONE- TELEX	AREA SUPT	1	LH	16	PS	7'0"				D	WOOD	"	"	"	OL	—	✓	—	—	DOOR TO BE SOLID CORE

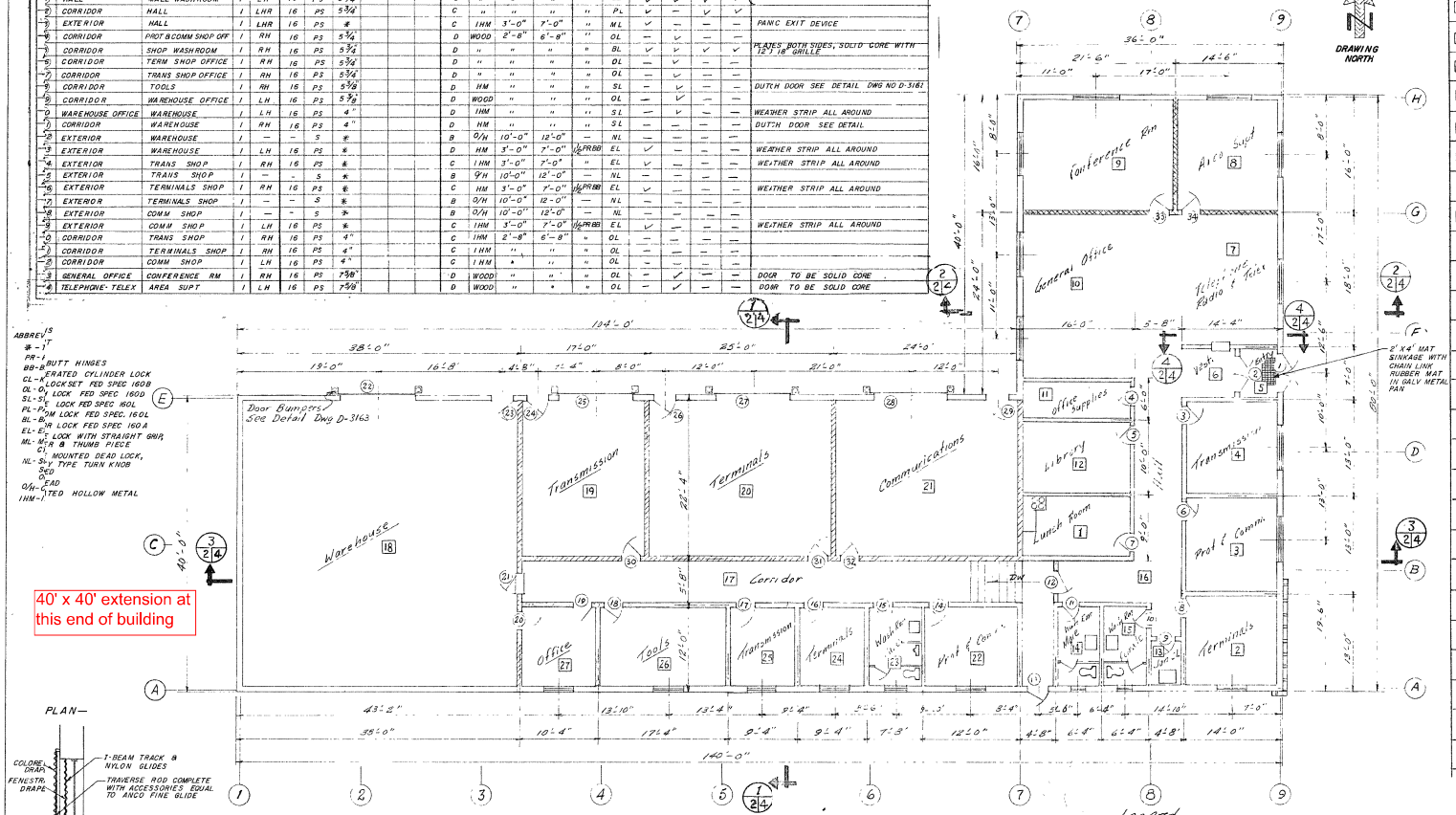
ABBREVIATIONS
* - 1T
PR-1 BUTT HINGES
BB-BALL BEARING
CL-CYLINDER LOCK
OL-OFFICE LOCKSET FED SPEC 160B
SL-STOREROOM LOCK FED SPEC 160D
PL-PRIVACY LOCK FED SPEC. 160L
BL-BATHROOM LOCK FED SPEC 160A
EL-ELECTRIC LOCK WITH STRAIGHT GRIP
ML-MORTISE LOCK WITH THUMB PIECE
CL-CYLINDER MOUNTED DEAD LOCK,
NL-SAFETY TYPE TURN KNOB
SCED SCHEDULED
OA-OVERHEAD
HM-HOLLOW METAL

Notes:-
4. For Door Details See Dwg No D-3162
2. Locations of doors, windows & columns may be altered slightly to suit building system.
3. All structural members in office areas are to be furred and concealed
4. Where steel building panel interior wall finish is called for panels shall be 8'-0" high min. & finished off-white

FINISH SCHEDULE

MARK	ROOM	FLOOR MATERIAL	WALL MATERIAL	FINISH	COLOR	CEILING
1	LUNCH ROOM					VAT- FLINKOTE CP80 WALL VINYL = ACCENT WALL NO 4029 CODE 8 HEYBS & BINGO TRIM FRENCH IVORY
2	TERMINALS					VAT = FLINKOTE CP 80 DOORS AND TRIM E 29
3	PROTECTION & COMMUNICATIONS					SAME AS MARK 2
4	TRANSMISSION					SAME AS MARK 2
5	ENTRY					EPOXY FLOOR PRIMARY CHIP TO MATCH VESTIBULE WALL SECONDARY CHIP TO MATCH ENTRY.
6	VESTIBULE					EPOXY FLOOR PRIMARY CHIP TO MATCH WALL, SECONDARY CHIP TO MATCH ENTRY WALL
7	TELEPHONE RADIO & TELEX					VAT = FLINKOTE CP 80 WALL VINYL OIL BONDAI 8-97 WHEAT GOLD DOORS AND TRIM E 329
8	AREA SUPERINTENDENT					HARDING HAWTHORN APRICOT NO 1491 CARPET WALL VINYL CILATE WALNUT DRAPES DAYA BOUCLEAR WHITE CARPET BROWN CHERMOYA 28
9	CONFERENCE ROOM					VAT = FLINKOTE CP 80 WALL VINYL OIL BONDAI 8-97 WHEAT GOLD DOORS AND TRIM E 329
10	GENERAL OFFICE					VAT = FLINKOTE CP 80 DOORS AND TRIM E329 VICTORIAN GOLD
11	OFFICE SUPPLIES					VAT = FLINKOTE CP80 DOORS AND TRIM E 329 VICTORIAN GOLD
12	LIBRARY					
13	JANITOR					MELAMINE TILEBOARD = BARKER TILE NOCH 191 EPOXY FINISH BURLAP STIPPLE ON NEUTRAL TINT
14	WASHROOM (MALE)					EPOXY FLOOR AND BASE PRIMARY CHIP P. BURLAP, SECONDARY CHIP NEUTRAL TINT DOORS AND TRIM E 329 VICTORIAN GOLD
15	WASHROOM (FEMALE)					
16	HALL					VAT = FLINKOTE CP 80 DOOR AND TRIM E 329 VICTORIAN GOLD
17	CORRIDOR					DOORS AND TRIM BEAVER 190 885 VAT = FLINKOTE CP80
18	WAREHOUSE					FLOOR FINISH MASTER PLATE NATURAL
19	TRANSMISSION SHOP					FLOOR FINISH MASTER PLATE TERRA COTTA DOORS AND TRIM E 329 VICTORIAN GOLD
20	TERMINALS SHOP					SAME AS MARK 20
21	COMMUNICATIONS SHOP					SAME AS MARK 20
22	PROTECTION & COMMUNICATION					VAT = FLINKOTE CP 80 DOORS AND TRIM BEAVER 190 885
23	WASHROOM (MALE)					SAME AS MARK 13 14 & 15
24	TERMINALS					VAT = FLINKOTE CP 80 DOORS AND TRIM BEAVER 190 885
25	TRANSMISSION					SAME AS MARK 24
26	TOOLS					FLOOR FINISH MASTER PLATE, TERRA COTTA DOORS AND TRIM 190885
27	OFFICE					VAT = FLINKOTE CP 80 DOOR AND TRIM BEAVER 190 885

COLORS SHOWN ARE MATCHLESS BY STANDA MANUFACTURING
WHERE VINYL ASBESTOS TILE (VAT) IS USED ASE SHALL BE BROWN VINYL
ALL OFFICE WINDOWS SHALL BE DRAPED WITHWHITE FENESTRATION FABRIC AN COLORED DRAPE JEFF BROWN JERSEY NO 1 OR EQUAL ON INDIVIDUA CORDLESS DRAWN DRAPE ROLANCO NO 633 OR EQUAL



Floor Plan.

PLAN—
COLORED DRAPE
FENESTRATION DRAPE
1-BEAM TRACK & NYLON GLIDES
TRAVERSE ROD COMPLETE WITH ACCESSORIES EQUAL TO ANCO FINE GLIDE

—ELEVATION—
FINISHED CEILING
GLASS FENESTRATION DRAPES
COLORED DRAPES
9'-0"
2'-0"

DR INSTALLATION DETAIL
Scale = ½" = 1'-0"

NUMBER OF SECTION OR DETAIL
NUMBER OF SHEET ON WHICH DETAIL OR SECTION IS TAKEN
NUMBER OF SHEET ON WHICH ITEM IS DETAILED
SYMBOL EXPLANATION

Legend
- Exterior Pre-engineered Construction
- 8" Concrete wall
- Steel stud and Gypsum Board
- Wood stud and gypsum board to roof with 1" Sound insulation
- Brick Face.

NO	DATE	REVISIONS	BY	CKD.

NEWFOUNDLAND & LABRADOR POWER COMMISSION
ST. JOHN'S, NEWFOUNDLAND

EASTERN AREA DEPOT WINTBOURNE

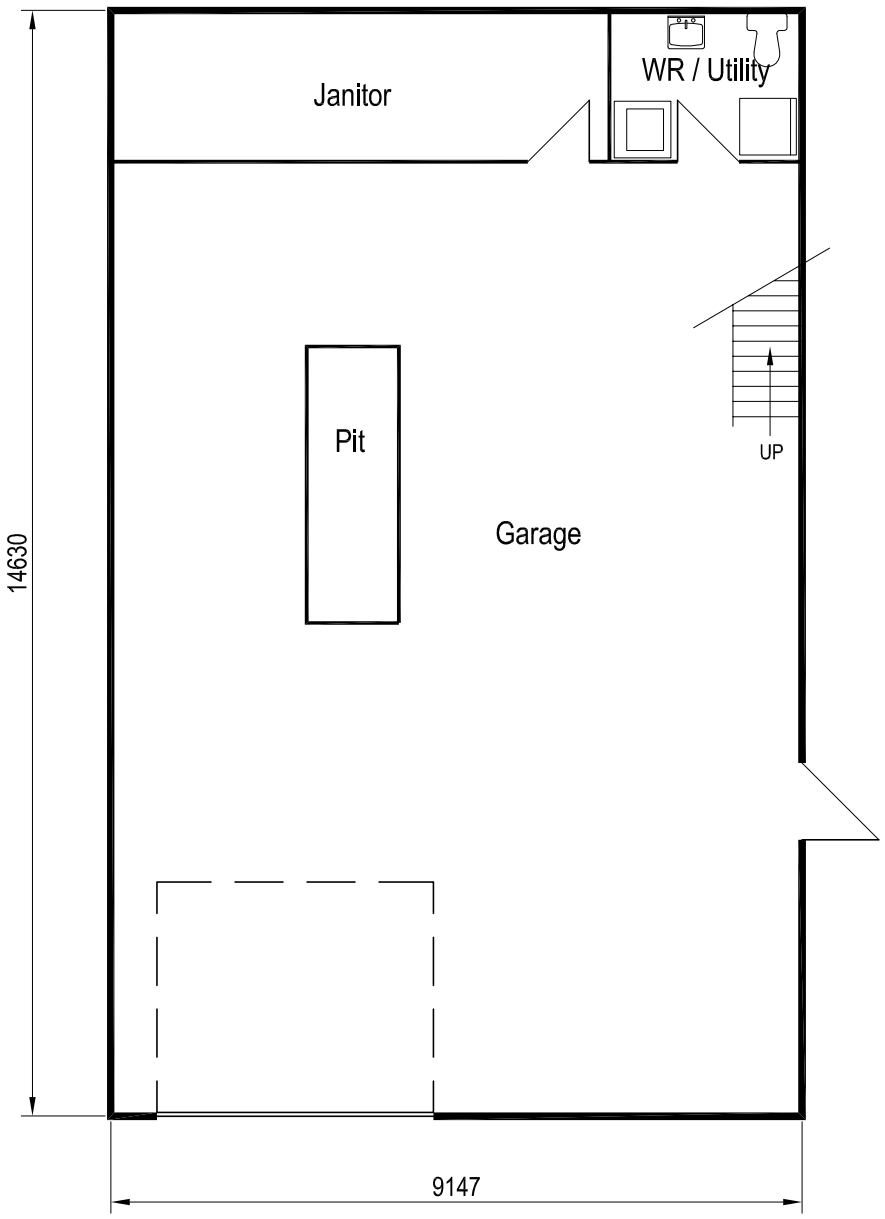
FLOOR PLAN

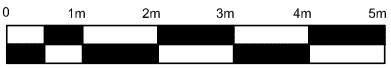
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Reference Dwgs.

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CHECKED BY | APPROVED BY | DATE July 31, 1974
PROJECT NO. | SHEET 2 OF 10 | DWG. No. D 3005

K&E





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PRIME CONSULTANT:

CBCL LIMITED
Consulting Engineers

ARCHITECTURAL CONSULTANT:

GLENN BARNES
ARCHITECTURE INC.

PROJECT:

BUILDING & INFASTRUCTURE CONDITION ASSESSMENTS FOR LINE DEPOTS, OFFICE FACILITIES AND CONTROL BUILDINGS

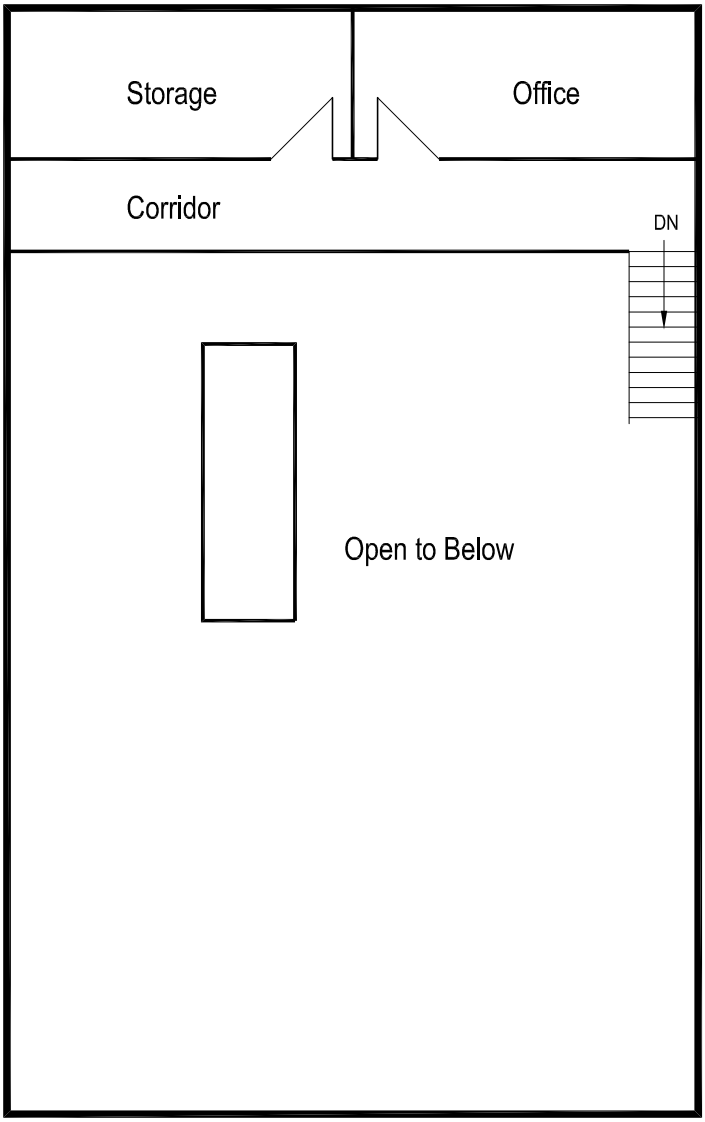
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WHITBOURNE NL

CLIENT:

NL HYDRO

SCALE:	DATE:	CLIENT NO.:	PROJECT NO.:	DRAWING NO.:
1:100	SEPT./16	66408 OS	163046.00	SK-8 R A



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PRIME CONSULTANT:

CBCL LIMITED
Consulting Engineers

ARCHITECTURAL CONSULTANT:

GLENN BARNES
ARCHITECTURE INC.

PROJECT:

BUILDING & INFASTRUCTURE CONDITION ASSESSMENTS FOR LINE DEPOTS, OFFICE FACILITIES AND CONTROL BUILDINGS

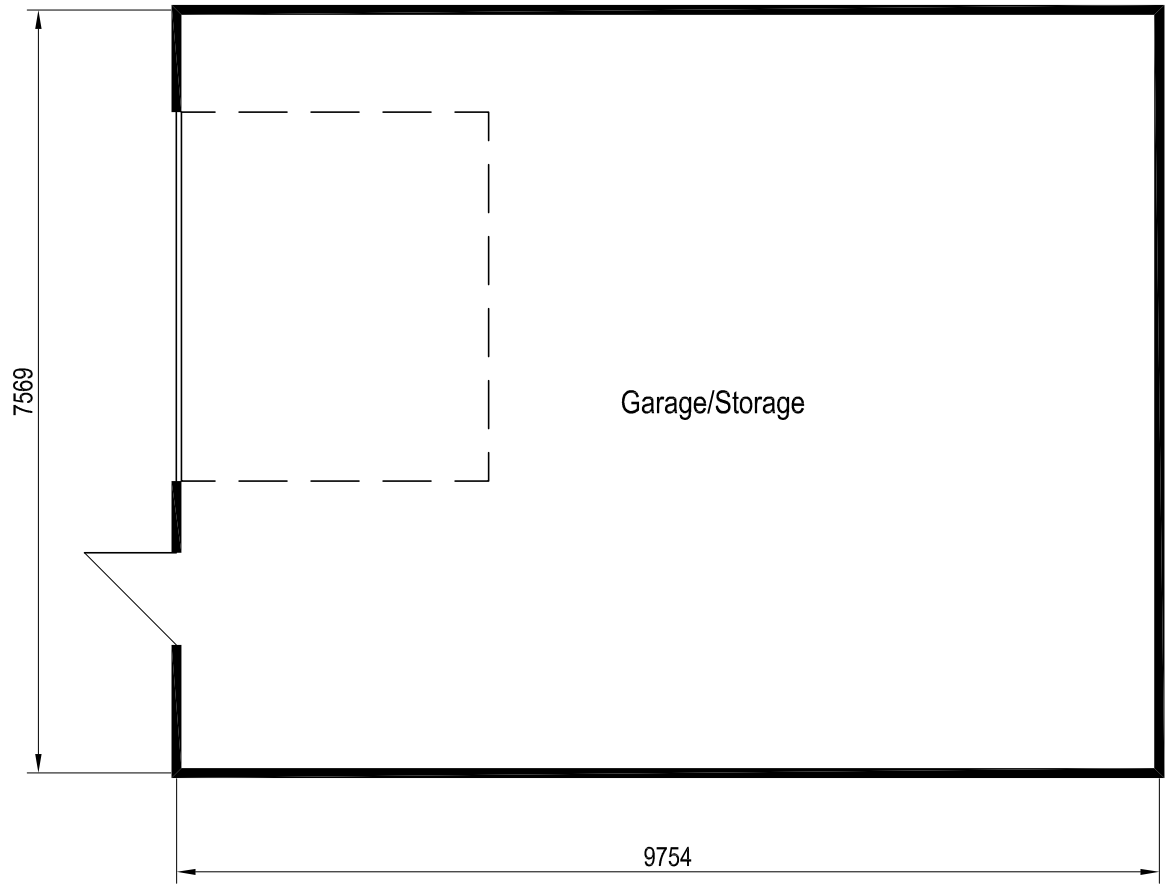
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SCHEMATIC PLAN - REPAIR GARAGE - LEVEL 2
WHITBOURNE NL

CLIENT:

NL HYDRO

SCALE:	DATE:	CLIENT NO.:	PROJECT NO.:	DRAWING NO.:
1:100	SEPT./16	66408 OS	163046.00	SK-9 R A



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1:75

PRIME CONSULTANT:

CBCL LIMITED
Consulting Engineers

ARCHITECTURAL CONSULTANT:

GLENN BARNES
ARCHITECTURE INC.

PROJECT:

BUILDING & INFASTRUCTURE CONDITION ASSESSMENTS FOR LINE DEPOTS, OFFICE FACILITIES AND CONTROL BUILDINGS

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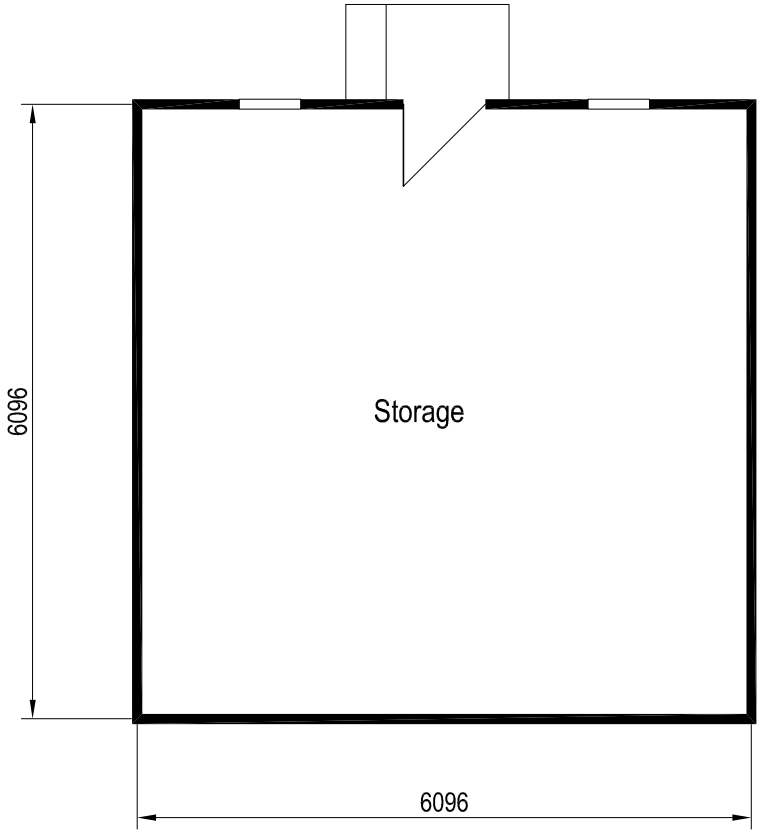
SCHEMATIC PLAN - QUANSIT

WHITBOURNE NL

CLIENT:

NL HYDRO

SCALE:	DATE:	CLIENT NO.:	PROJECT NO.:	DRAWING NO.:
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1:75

PRIME CONSULTANT:

CBCL LIMITED
Consulting Engineers

ARCHITECTURAL CONSULTANT:

GLENN BARNES
ARCHITECTURE INC.

PROJECT:

BUILDING & INFASTRUCTURE CONDITION ASSESSMENTS FOR LINE DEPOTS, OFFICE FACILITIES AND CONTROL BUILDINGS

DRAWING TITLE:

SCHEMATIC PLAN - STORAGE #2

WHITBOURNE NL

CLIENT:

NL HYDRO

SCALE:	DATE:	CLIENT NO.:	PROJECT NO.:	DRAWING NO.:
1:75	SEPT./16	66408 OS	163046.00	SK-7 R A

Appendix G

Facilities Management Jurisdictional Scan



Respondent Identification	Question 1: What is the type of your Utility?	Question 2: How many buildings does your organization own, operate and maintain?	Question 3: Has your organization assessed the condition of all buildings within its ownership? If 'Yes', how often do you assess their condition? If 'No', are you planning on this in the future?	Question 4: Does your organization track the condition of their buildings for ranking purposes?	Question 5: How does your organization prioritize which facility refurbishment projects are undertaken each year?	Question 6: Are you required to seek approval from your regulator for facilities capital expenditures such as refurbishment?	Question 7: How are estimates for facilities refurbishment developed by your utility?	Question 8: How does your organization establish a prudent threshold for its refurbishment expenditures?	Question 9: Do you currently have any criteria and processes regarding the establishment of a threshold for refurbishment expenditures, or the prioritization of refurbishment projects, that you are willing to share?
Utility 1	Crown-Owned	100-200	Yes. Targeting annually, during our preventative maintenance work we update our records.	Yes, condition of the building is considered in ranking projects.	The Properties Team meets with each department to gather their plans for the upcoming year and adjust our properties plans.	No, we are not required to submit a detailed list of facility expenditures to our regulator. The larger facility projects would appear on [Utility 1's] overall capital project report that goes to our stakeholder and then indirectly be shared with our regulator for information.	A staged estimate approach is used and as the design is refined, the estimate is also refined. Typically, initial design funds are approved by our Executive with information shared with our Board. Then after schematic design is completed, an updated design and estimate is shared and approvals to proceed with design and procurement is required from our Executive. If the projects is over $20M, our board needs to approve also with a maximum project value that is not to be exceeded. Additional updates to the Executive/Board may be requested depending on the size of the project and sensitivities.	We have used a few different tools to validate expenditures including early engagement of a general contractor in the project to comment on constructability of designs and opportunities to reduce costs. This general contractor estimate is in parallel with the estimator that is embedded in the design team and estimates are competed independently. The general contractor also provides construction costs for other local construction projects in the province as a comparison along with industry trends for labour, material, other risks for the province (and neighboring provinces).	No, we don't have specific criteria for refurbishment expenditures as each refurbishment is very different and generated during project initiation, requirements gathering and design charettes.
Utility 2	Investor-Owned	<50	No, and no.	Condition is based on current usability of the building and whether the building is acceptable for current use/needs. Or if a significant safety, system or environment issue is detected. When either of these scenarios occur, the building is assessed in part or whole depending on the solution required. To justify the action taken. Once justification for a solution is created and approved the project is then fit into the current business plan.	Prioritized based on immediate risk to safety of workers, reliability of the electrical system, and risk to the environment.	All capital and O&M costs are presented to the regulator and subject to review and approval. Large projects may be held off until presented and approved by the regulator. Smaller projects or higher risk issues may proceed prior to approval with these costs presented after completion to the regulator.	External resources are utilized to create estimates for refurbishment.	Business case justification is the cost of replacement of a facility or facility asset prudent when compared to the proposed costs to repair the existing one.	No defined criteria or process, currently.
Utility 3	Investor-Owned	100-200	Yes. They are not formal assessments but we have a civil crew that visit each site at least a couple of times a year to do repairs. During those visits they take note of building conditions.	We don't have a formal ranking system but buildings deemed to need work within the next five years are put in the five-year business plan.	Safety is the first priority. If something can be refurbished to make it safer for our employees and local operator, that will take precedence (ie. modifications to keep icicles from forming). Water ingress is also a major priority. Roof leaks and water running into the building due to poor drainage are addressed quickly.	Planned work has to be in the business plan which has to fit within the rates and subsidies approved by the regulator. Within the business plan there is also money allotted for unplanned work that may pop up.	Repairs and building of new wood structures (garages, storage buildings) are typically estimated and constructed by our civil crew with the help of contractors when required. Steel generator buildings are estimated and designed by our engineering department.	Our refurbishment work has typically been repairs that weren't too costly, so there was not a lot of concern about having a threshold. We are starting to see a handful of 1980's vintage buildings that will need extensive repairs or replacement in the next 5-10 years. Buildings of that vintage were not very robust with no structural steel, just wood or metal studs and metal sheeting, and a very light roof structure. We are looking at replacing one of those buildings next year with a modular station since it has road access. The others are in communities that we are hoping to get approval for grid connection before the buildings need replacement. Buildings from the mid-90's and newer were better built and are expected to just need typical repairs well into the future.	Nothing formal. Required work is identified and prioritized internally and put into the five-year business plan.
Utility 4	Crown-Owned	50-100	No, and yes.	We track the condition and energy consumption of our district offices and leased properties. Facilities is not responsible for all our properties, only district offices currently.	We have an assigned capital budget based on our facility condition assessments and we execute our plan based on budget and severity.	We are only required to seek approval from our regulator if the capital expenditures are in excess of $50M.	We base them on opinions of probable cost from consultants, past jobs of similar work, experience of the [facilities] team, and we obtain estimates as well. Our condition assessments indicate estimates, but they are low. This is a challenge currently where prices fluctuate frequently.	We base it on what is required over how long a time period. We do risk assessments to ensure tolerance is in place. All capital projects and programs are assessed against divisional requirements.	No, not specifically for refurbishment projects. At the Divisional level, the Investment Review Committee (IRC) determines which projects within the division should be put forward for prioritization. Each Division has an internal process for identifying potential projects. Planning criteria include forecasted future load growth, specific requirements from customers, safety concerns, aging infrastructure, upgrade requirements, regulatory commitments, as well as inspection and condition assessment results. Each IRC is then responsible for vetting and prioritizing capital submissions in their respective areas. IRCs use the same investment rationale template and project scoring matrix to ensure capital projects are evaluated consistently as the Divisions compete for a limited capital spending envelope. Capital projects are evaluated on both financial and non-financial criteria and the final decision on each specific project is based on an overall assessment of costs and benefits, evaluation of risk, and how each project ranks against the others within the portfolio.
Utility 5	Investor-Owned	100-200	No, and no.	No.	Age or failure in service.	Yes.	Developed internally utilizing historical tender results for costing inflated to current year.	N/A	None exist at our organization.
Utility 6	Investor-Owned	50-100	No, and yes.	For substations, we are starting to collect building condition assessment data in a standardized format but do not yet have enough data across the system to rank the sites yet.	Urgent or reactive work is completed under a reactive budget within the same fiscal year. Planned work is identified and included in our next general tariff application, typically on a three year cycle.	Yes.	Project scopes are developed by our architectural and engineering service providers, and estimates are compiled based on quotations and historical costs.	Substation building refurbishments are evaluated in coordination with the substation equipment condition and expected life.	We do not have a formal process, other than to coordinate with substation equipment expected life. We have found that our existing buildings are often not large enough to accommodate modern switchgear, and switchgear replacement projects have needed to include a new building.
Utility 7	Investor-Owned	<50	No, and yes.	No.	No formal process, often based on need of repair.	Yes.	Past experience and request for quotes.	N/A	No.

Diesel In-Service Failures

(2027)



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Diesel In-Service Failures (2027)

Location: Various

Investment Classification: Renewal

Asset Category: Generation

Estimated Cost: $1,256,900

1.0 Introduction

Newfoundland and Labrador Hydro ("Hydro") conducts asset management activities to proactively identify, replace, repair, or refurbish equipment to minimize the disruption of service and to avoid unsafe working conditions due to equipment failure. An objective of Hydro's Asset Management Program is to identify refurbishment and replacement activities that require approval by the Board of Commissioners of Public Utilities ("Board") in time to be included in Hydro's annual capital budget application ("CBA"). This is achieved through the Preventive Maintenance Program using various condition-based assessments and testing procedures.

Hydro has had success in projecting the deterioration rate of equipment for submission of refurbishment or replacement work into CBAs. However, there are situations where immediate refurbishment or replacement must be completed due to the occurrence of an actual failure, the identification of an imminent failure, or the identification of faster-than-anticipated equipment deterioration. These situations can be caused by events such as vandalism, storm damage, lightning, accidental damage, abnormal system operations, corrosion, and wear of mechanical components. Hydro uses historical data and engineering judgment to predict the magnitude of these in-service failure expenditures.

2.0 Program Description and Justification

Due to the nature of internal combustion engines and diesel generation equipment, unanticipated failures and deterioration occur. Under the Diesel In-Service Failures Program, Hydro is proposing to undertake immediate capital refurbishment and replacement work required to maintain the safe and reliable operation of its diesel generating assets and to ensure the availability of capital spares required to support such work. Deferral of work that is justified under this program could result in a detrimental impact to customer power supply or unacceptable risk to workers or public safety. In most cases, diesel

generating stations are the only source of power for the community served, and equipment failures must be addressed promptly. Required work will be evaluated to determine the appropriate form of execution as an in-service failure, an Allowance for Unforeseen Item, or a supplemental project.

At this time, Hydro does not have any planned capital spare acquisitions. Throughout 2027, Hydro may purchase capital spares identified by asset management personnel as requiring immediate procurement to offset deficiencies in its capital spares inventory and to account for increasing lead times for equipment.

3.0 Asset Overview

3.1 Asset Background

The assets requiring immediate, unplanned replacement or refurbishment work in a given year cannot be identified in advance. The assets covered within the Diesel In-Service Failures Program are associated with 23 diesel generating stations in Newfoundland and Labrador, which may include the execution of the following in-service failure work:

- Premature engine failure;
- Premature radiator failures;
- Premature generator failures; and
- Unexpected failure of auxiliary equipment.

For further information on the work executed under the Diesel In-Service Failures (2025) Program that individually exceeded $750,000, please refer to Hydro's "Capital Expenditures and Carryover Report for the Year Ended December 31, 2025."[1]

3.2 Asset Condition

Assets replaced or refurbished under this program have experienced unplanned failure or exhibit signs of incipient failure; therefore, these assets have reached the end of their serviceable life.

[1] Provided as Appendix B to Schedule 5 of this application.

3.3 Asset Ages

The age of assets potentially covered under this program varies. Unplanned replacement or refurbishment activities due to failure may be necessary at any time during the asset life cycle. The diesel genset fleet ranges in age from less than one year to 55 years, and currently ranges in operating hours from 208 to 110,758 hours. Chart 1 shows the age distribution of the genset fleet.

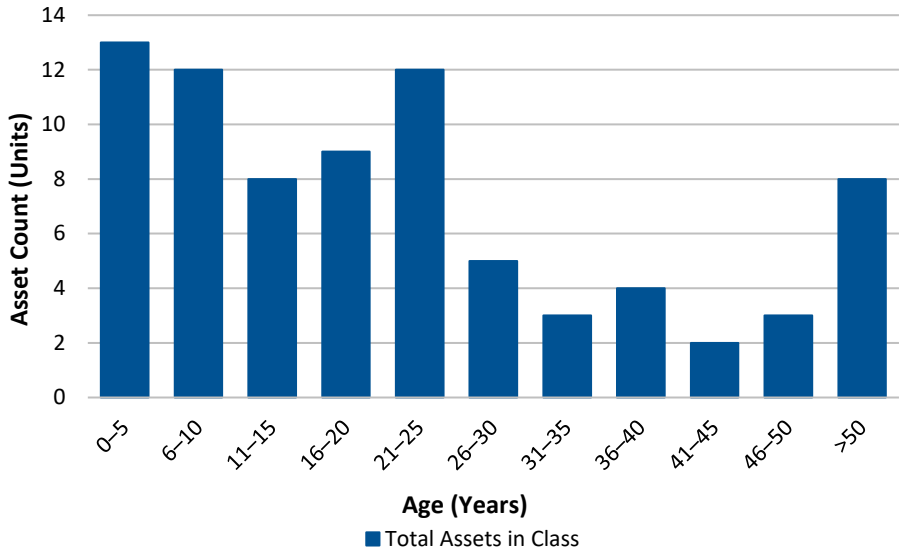


Chart 1: Asset Counts by Asset Age

4.0 Trending

Hydro implemented the Diesel In-Service Failures Program in 2023. Since that time, on average, Hydro has executed nine unplanned projects per year under this program.

4.1 Assets Installed/Replaced/Upgraded

The number of unplanned In-Service Failures projects initiated under the program since its implementation in 2023 is provided in Chart 2. Hydro anticipates that unplanned failures will continue to occur, given the age and number of assets covered under the program. As this program started in 2023, Hydro now has enough historical expenditure data to develop this estimate based on the average expenditures of the last three years, consistent with the other in-service failures progams.

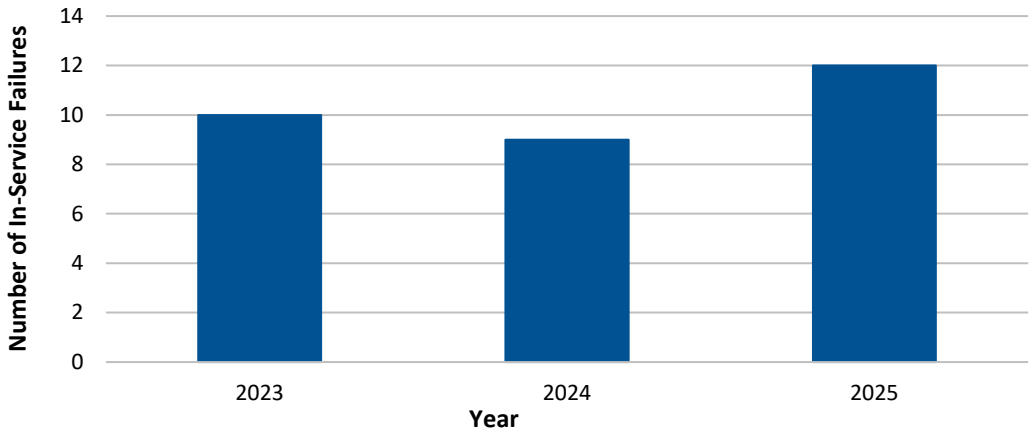


Chart 2: In-Service Failure Frequency

4.2 Historical and Forecast Average Unit Costs

Historical and forecast program costs are provided in Chart 3 in Section 6.1. Due to the nature of this program and the range of assets covered, average unit cost information is not applicable.

5.0 Analysis

5.1 Evaluation of Alternatives

Depending on the nature of each failure, or incipient failure, Hydro reviews viable technical alternatives to determine the most appropriate solution to address the unplanned event while balancing urgent safety and operational risks.

Due to the urgent nature of work executed under this program, seeking approval through a supplemental capital expenditures application or deferring the work for inclusion in the next CBA are not viable alternatives. The alternative of executing required unplanned work under the Allowance for Unforeseen Items Account is also considered on a case-by-case basis, subject to the requirements set out by the Board for use of the account.

5.2 Risk of Asset Stranding

Assets replaced or refurbished under this program have an inherently low risk of asset stranding. The assets covered under this program are critical to Hydro's ability to meet customer requirements. Diesel generating stations are often isolated, and in most cases are the sole sources of power to a community;

therefore, the risk of asset stranding is low. Should a facility be identified for closure due to a change in customer service requirements,[2] Hydro will retain and redeploy assets to other locations.

5.3 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of this program in accordance with Hydro's Capital Risk Assessment process as outlined in Section 7.0 of Schedule 1. The outcome of this assessment is provided in Table 1.

Table 1: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	3	5	**15**
Post-Implementation	3	1	**3**
		Risk Mitigated	**12**
		Risk Mitigated per $1 Million	**9.5**

6.0 Scope of Work

6.1 Program Budget

The estimate for this program is shown in Table 2. As this program started in 2023, Hydro now has enough historical expenditure data to develop this estimate based on the average expenditures of the last three years, consistent with the other in-service failures progams. As such, the estimate is based on the average expenditures from 2023 to 2025.

The details of each scope covered under this program that individually exceeded $750,000, including the associated assets and costs, as well as the total program expenditures for each year, are filed with the Board within Hydro's annual Capital Expenditures and Carryover Report.[3] Work executed under this program in 2027 that individually exceeds $750,000 will be reported to the Board in Hydro's 2027 Capital Expenditures and Carryover Report.[4]

[2] Such as community resettlement.
[3] Hydro's most recent Capital Expenditure and Carryover Report was filed with the Board on April 1, 2026.
[4] Hydro's 2027 Capital Expenditures and Carryover Report is to be filed on or before April 1, 2028.

Table 2: Program Estimate ($000)

Program Cost	2027	2028	Beyond	Total
Material Supply	780.0	0.0	0.0	**780.0**
Labour	337.3	0.0	0.0	**337.3**
Consultant	0.0	0.0	0.0	**0.0**
Contract Work	0.0	0.0	0.0	**0.0**
Other Direct Costs	102.4	0.0	0.0	**102.4**
Interest and Escalation	37.2	0.0	0.0	**37.2**
Contingency	0.0	0.0	0.0	**0.0**
Total	**1,256.9**	**0.0**	**0.0**	**1,256.9**

Chart 3 provides the historical expenditures since the program was initiated, the forecast 2026 expenditures, the proposed 2027 program budget, and the forecast budget through 2031. The significant program costs shown in 2024 are primarily associated with the replacement of the Charlottetown spare mobile generator, at a cost of approximately $1,085,000. As Hydro cannot predict the quantity and the nature of failures to be addressed within this program for future years, Hydro has forecast future expenditures for this program based on the 2027 program budget with cost escalation applied.

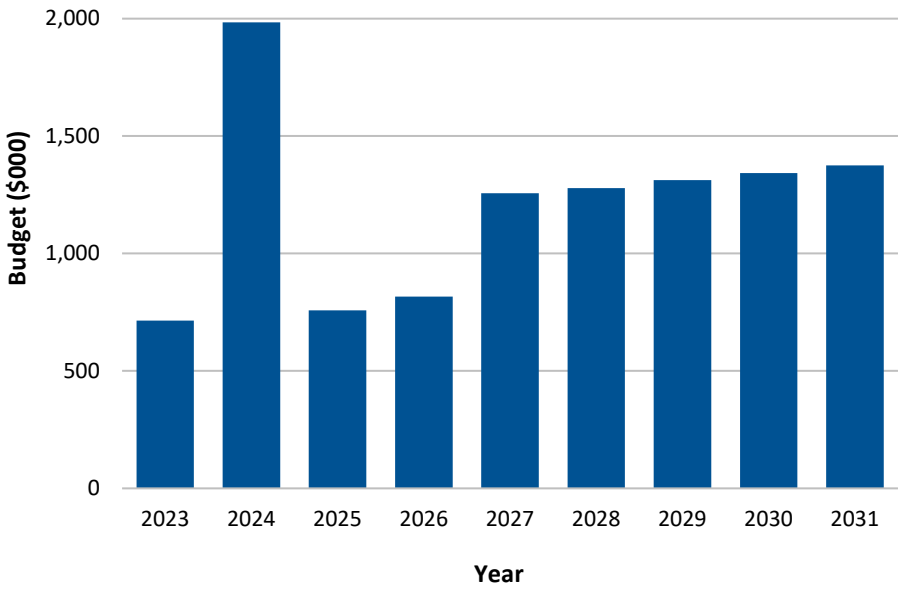


Chart 3: Historical and Forecast Program Budget

6.2 Program Schedule

Work schedules are established subsequent to an unplanned failure or incipient failure event. There are currently no planned capital spares acquisitions for 2027.

7.0 Conclusion

The Diesel In-Service Failures Program allows Hydro to undertake timely refurbishment and replacement work that is not included in its Preventive Maintenance Program, supporting Hydro's effort to maintain safe and reliable operations, in an environmentally responsible manner. This program will also allow Hydro to continue to proactively manage the pool of capital spare equipment to maintain the integrity and reliability of the electrical system.

Combustion Turbine In-Service Failures

(2027)



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Combustion Turbine In-Service Failures (2027)

Location: Various

Investment Classification: Renewal

Asset Category: Combustion Turbines

Estimated Cost: $ 1,038,000

1.0 Introduction

Newfoundland and Labrador Hydro ("Hydro") conducts asset management activities to proactively identify, replace, repair, or refurbish equipment to minimize the disruption of service and avoid unsafe working conditions due to equipment failure. One of the primary objectives of Hydro's Asset Management Program is to identify refurbishment and replacement activities that require approval by the Board of Commissioners of Public Utilities ("Board") in time to be included in Hydro's annual capital budget application ("CBA"). This is achieved through the preventive maintenance program using various condition-based assessments and testing procedures.

Hydro has had success in projecting the deterioration rate of equipment for submission of refurbishment or replacement work into CBAs. However, there are situations where immediate refurbishment or replacement must be completed due to the occurrence of an actual failure, the identification of an imminent failure, or the identification of faster-than-anticipated equipment deterioration. These situations can be caused by events such as vandalism, storm damage, lightning, accidental damage, abnormal system operations, corrosion, and wear of mechanical components. Hydro uses historical data and engineering judgment to predict the magnitude of in-service failure expenditures.

As identified through the 2024 Resource Adequacy Plan,[1] the Stephenville Gas Turbine ("GT") and the Hardwoods GT shall remain available through the Bridging Period.[2] At this time, capital investment

[1] "2024 Resource Adequacy Plan – An Update to the Reliability and Resource Adequacy Study," Newfoundland and Labrador Hydro, rev. August 26, 2024 (originally filed July 9, 2024).

[2] Hydro considers the Bridging Period to be from the present to 2030 or until such time that sufficient alternative generation is commissioned, adequate performance of the Labrador-Island Link is proven, and generation reserves are met. During the Bridging Period, the system would rely primarily on existing sources of generation capacity to maintain reliability while new generation capacity is being built. The primary, readily available supply options in this period are extending the retirements of the Holyrood Thermal Generating Station, Stephenville GT and the Hardwoods GT until their capacities can be adequately replaced.

related to the generation and synchronous condenser function of these facilities is necessary to support system reliability and maintain Hydro's ability to meet customer demand during peak periods.

2.0 Program Description and Justification

Under the Combustion Turbine ("CT") In-Service Failures Program, Hydro completes immediate capital refurbishment and replacement work required for its CT assets as needed to ensure the delivery of safe, reliable, least-cost electricity in an environmentally responsible manner and to ensure the availability of capital spares required to support such work. At this time, Hydro does not have any planned capital spare acquisitions; however, throughout 2027, Hydro may purchase capital spares identified by asset management personnel as requiring immediate procurement to offset deficiencies in its capital spares.

Due to the nature of CTs, unanticipated failures and deterioration occur. This program provides an effective and timely means to undertake the immediate capital refurbishment and replacement work required for CTs and associated equipment. Deferral of work that is justified under this program could result in a detrimental impact to customer power supply or unacceptable risk to workers or public safety.

Required work will be evaluated to determine the appropriate form of execution as an in-service failure, an allowance for unforeseen item or a supplemental project, depending on the relevant circumstances.

3.0 Asset Overview

3.1 Asset Background

Hydro owns and operates four CT facilities, as outlined in Table 1.

Table 1: Combustion Turbine Facilities

Facility	Rating (MW)	Year Commissioned
Hardwoods GT	50	1976
Stephenville GT	50	1975
Holyrood CT	123.5	2015
Happy Valley GT	25	1992

Each facility consists of one or two CTs and a generator, and a number of auxiliary systems including fuel oil, lube oil, cooling systems, instrumentation, and protection and control systems which are required for the unit to operate in a safe and reliable manner.

This program is required to address unforeseen failures of various CT generating station equipment where immediate refurbishment or replacement must be completed due to actual failures, the identification of an incipient failure, or faster-than-anticipated equipment deterioration. This program covers the assets associated with CT facilities, which may include the execution of the following in-service failure work:

- Premature engine failure;
- Premature bearing failure/rebabbitting;
- Premature failure of electrical equipment; and
- Unexpected failure of auxiliary system components.

For further information on the work executed under the GT In-Service Failures (2025) Program that individually exceeded $750,000, please refer to Hydro's "Capital Expenditures and Carryover Report for the Year Ended December 31, 2025."[3]

3.2 Asset Condition

The CT plants are generally in good condition. However, unanticipated asset failures and deterioration occur due to unit operation. The assets requiring immediate, unplanned replacement or refurbishment work in a given year cannot be identified in advance. Assets replaced or refurbished under this program have experienced unplanned failure or exhibit signs of incipient failure; therefore, these assets have reached the end of their serviceable life.

3.3 Asset Ages

The age of assets potentially covered under this program varies. Unplanned replacement or refurbishment activities due to failure may be necessary at any time during the asset lifecycle.

[3] Provided as Appendix B to Schedule 5 of this application.

4.0 Trending

Hydro implemented the CT In-Service Failures Program in 2023. Since that time, on average, Hydro has executed five unplanned projects per year under this program.

4.1 Assets Installed/Replaced/Upgraded

The number of unplanned In-Service Failures projects executed under the program over the past three years is provided in Chart 1.[4] Hydro anticipates that unplanned failures will continue to occur given the age and number of assets covered under the program. As this program started in 2023, Hydro now has enough historical expenditure data to develop this estimate based on the average expenditures of the last three years, consistent with the other in-service failures progams.

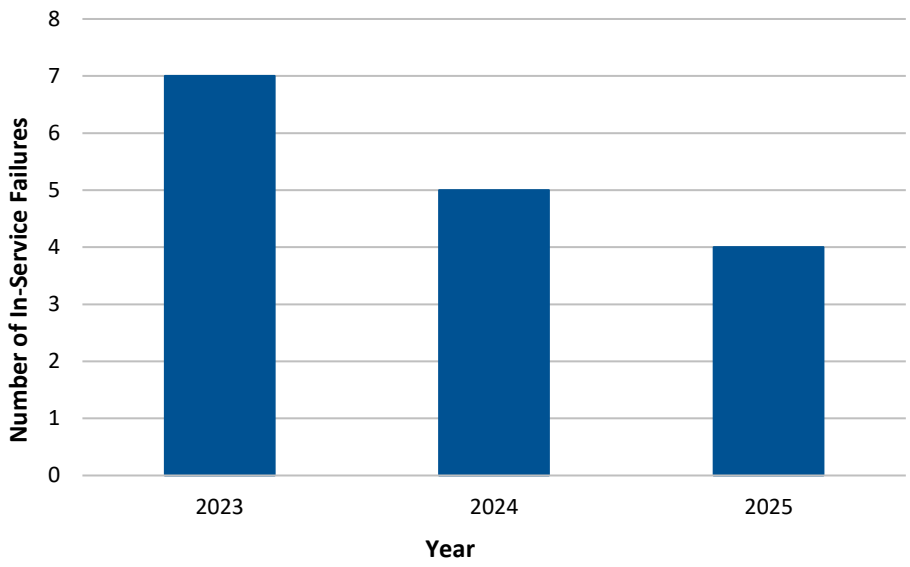


Chart 1: In-Service Failure Frequency

4.2 Historical and Forecast Average Unit Costs

Historical and forecast program costs are provided in Section 6.1. Due to the nature of this program and the range of assets covered, average unit cost information is not applicable.

[4] This program commenced in 2023.

4.3 Historical Reliability

Hydro tracks performance data for its CT units using the Derated Adjusted Utilization Forced Outage Probability ("DAUFOP"); this data is filed quarterly with the Board.[5,6] This program plays a key role in allowing Hydro to minimize the DAUFOP of its CT units to ensure the provision of reliable service to customers by ensuring Hydro can address failing components quickly to minimize forced outages that could impact the system.

5.0 Analysis

5.1 Evaluation of Alternatives

Depending on the nature of each failure, or incipient failure, Hydro reviews viable technical alternatives to determine the most appropriate solution to address the unplanned event while balancing urgent safety and operational risks.

Due to the urgent nature of work executed under this program, seeking approval through a supplemental capital expenditures application or deferring the work for inclusion in the next CBA are not viable alternatives. The alternative of executing required unplanned work under the Allowance for Unforeseen Items Account is also considered on a case-by-case basis, subject to the requirements set out by the Board for the use of the account.

5.1.1 Risk of Asset Stranding

The risk of asset stranding is less imminent as a result of the decision to extend the Stephenville GT and Hardwoods GT to remain available through the Bridging Period. Assets replaced or refurbished under this program are required to ensure reliable operation for customers, and capital expenditures for these facilities continue to be required. The Happy Valley GT, Hardwoods GT and Stephenville GT also have the ability to operate as synchronous condensers to provide voltage support to the power system.

[5] DAUFOP is the probability that a generating unit will not be available due to forced outages or forced deratings when there is demand on the unit to generate.
[6] "Quarterly Report on Asset Performance in Support of Resource Adequacy for the Twelve Months Ended March 31, 2026," Newfoundland and Labrador Hydro, May 4, 2026.

5.1.2 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the this program in accordance with Hydro's Capital Risk Assessment process, as outlined in Section 7.0 of Schedule 1. The outcome of this assessment is provided in Table 2.

Table 2: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	3	5	**15**
Post-Implementation	3	1	**3**
		Risk Mitigated	**12**
		Risk Mitigated per $1 Million	**11.6**

6.0 Scope of Work

6.1 Program Budget

As this program started in 2023, Hydro now has enough historical expenditure data to develop this estimate based on the average expenditures of the last three years, consistent with the other in-service failures progams. As such, the estimate is based on the average expenditures from 2023 to 2025.

The details of each scope covered under this program that individually exceeded $750,000, including the associated assets and costs, as well as the total program expenditures for each year, are filed with the Board within Hydro's annual Capital Expenditures and Carryover Report.[7] Work executed under this program in 2027 that individually exceeds $750,000 will be reported to the Board in Hydro's 2027 Capital Expenditures and Carryover Report.[8]

The expenditures in 2023 and 2024 associated with the Stephenville GT – Alternator Cooling Fan Failure were not included in the average calculation. These costs were considered outliers due to the unlikelihood of these failures to reoccur.[9] Hydro will re-evaluate the inclusion of both costs in future program budgets should similar failures or replacements continue to occur.

The estimate for this program is shown in Table 3.

[7] Hydro's most recent Capital Expenditure and Carryover Report was filed with the Board on April 1, 2026.
[8] Hydro's 2027 Capital Expenditures and Carryover Report is to be filed on or before April 1, 2028.
[9] The cost associated with refurbishment of the Stephenville GT – Alternator Cooling Fan Failure was $9,655,500.

Table 3: Program Estimate ($000)

Program Cost	2027	2028	Beyond	Total
Material Supply	765.0	0.0	0.0	**765.0**
Labour	227.3	0.0	0.0	**227.3**
Consultant	0.0	0.0	0.0	**0.0**
Contract Work	0.0	0.0	0.0	**0.0**
Other Direct Costs	17.0	0.0	0.0	**17.0**
Interest and Escalation	28.7	0.0	0.0	**28.7**
Contingency	0.0	0.0	0.0	**0.0**
Total	**1,038.0**	**0.0**	**0.0**	**1,038.0**

Chart 2 provides the historical expenditures since the program was initiated, the forecast 2026 expenditures, the proposed 2027 program budget, and the forecast budget through 2031. The increase in the 2025 expenditures can be mainly attributed to the Hardwoods GT – Spare Engine Overhaul with actual cost of $1,586,873. As Hydro cannot predict the quantity and the nature of failures to be addressed within this program for future years, Hydro has forecast future expenditures for this program based on the 2027 program budget with cost escalation applied.

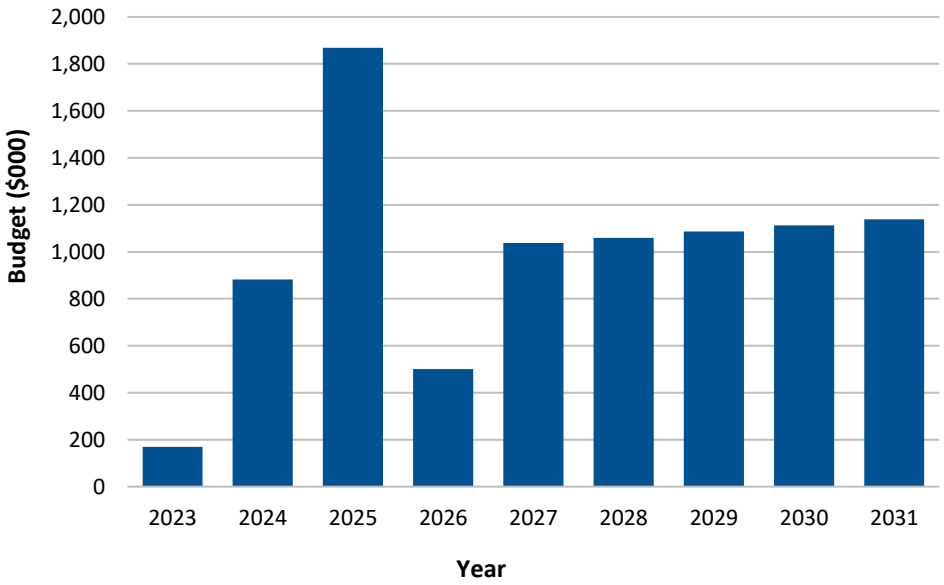


Chart 2: Historical and Forecast Program Budget

6.2 Program Schedule

Work schedules are established subsequent to an unplanned failure or incipient failure event. There are currently no planned capital spares acquisitions for 2027.

7.0 Conclusion

The CT In-Service Failures Program allows Hydro to undertake timely refurbishment and replacement work that is not included in its preventive maintenance program, supporting Hydro's effort to maintain safe and reliable operations. This program will also allow Hydro to continue to proactively manage the pool of capital spare equipment to support CT generation operations.

Modify Office Buildings and Procure Furniture, Fixtures, and Equipment

(2027)

newfoundland labrador hydro

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Modify Office Buildings and Procure Furniture, Fixtures, and Equipment (2027)

Location: Various

Investment Classification: General Plant

Asset Category: Administration

Estimated Cost: $992,400

1.0 Introduction

Newfoundland and Labrador Hydro ("Hydro") is required to perform office retrofits and purchase office furniture, tools and equipment to support operations at Hydro's office facilities.[1] To maintain business operations, an allowance is necessary to perform these office retrofits or replace these capital items when needed. For the 2027 Capital Budget Application, the scope of this program will encompass applicable capital work and purchases for Hydro Place and other area offices, including modifications to existing office and meeting room spaces to better accommodate growing business needs.

2.0 Program Description and Justification

The program is required to provide Hydro with a budget to perform office retrofits and to purchase office furniture, tools and equipment on an as required basis. These purchases may include new equipment to address in-service failures, or purchases of capital spares. Office retrofits are related to organizational structure changes and unforeseen requests to accommodate departmental or individual employee needs. Hydro has seen an increase in these requests for office retrofits developing over the last four years.

Furniture and equipment purchases have a limited service life of 20 years on average. As such Hydro requires consistent funds to replace items which are nearing end-of life or underperforming. Unforeseen changes to meet the objectives of the business require necessary accommodations in the built environment. To maintain efficient business operations or uninterrupted service delivery, a capital

[1] Examples of items that are purchased under this program include desks, chairs, file cabinets, and kitchen appliances.

allowance is necessary to perform office retrofits and purchase replacement furniture and equipment as required.

3.0 Asset Overview

3.1 Asset Background

Hydro owns and operates office buildings where office retrofits or equipment purchases could be required to facilitate day-to-day operations.

3.2 Asset Condition

Office furniture has an average service life of 20 years. Items considered for replacement under this program would have either reached their useful service life or are underperforming and can no longer adequately serve its intended purpose.

Office retrofits are those modifications required to meet department or individual employee needs where the existing space is no longer providing sufficient or appropriate accommodation, as with the meeting room and office modifications herein.

3.3 Asset Ages

The age of assets covered under this program varies. Unplanned replacement or retrofit activities due to performance or changing business needs may be necessary at any time during the asset lifecycle. The ages of individual assets across this program will vary based on usage and business needs.

4.0 Trending

4.1 Assets Installed/Replaced/Upgraded

This program commenced in 2025. Under this program, office furniture purchases and retrofits are done based on age, condition, and business requirements.

4.2 Historical and Forecast Average Unit Costs

Due to the nature of this program and the range of assets covered, average unit cost information is not applicable.

5.0 Analysis

5.1 Evaluation of Alternatives

Hydro evaluated the following alternatives:

- Pace Reduction;
- Pace Advancement; and
- Continuation of Program at Current Pace.

5.1.1 Pace Reduction

This program is for the completion of miscellaneous retrofit and office furniture purchases. Replacing required office furniture and equipment at a reduced pace will see assets in-service past their useful lives, potentially impacting employee health, safety, and productivity. A delay in the retrofit of required spaces could lead to a decrease in operational efficiency. As such, Hydro does not consider this a viable alternative.

5.1.2 Pace Advancement

Advancement of furniture and equipment purchases would see assets coming out of service before they have reached their useful service life, incurring unnecessary costs. As retrofits and equipment purchases are based on business needs, advancement considerations are not possible. For these reasons, Hydro does not consider this a viable alternative.

5.1.3 Continuation of Program at Current Pace

Proceeding with the identified retrofits and purchases ensures the assets identified in this proposal would be in-service in a timely manner, to meet business needs and to support operations at Hydro's office facilities.

5.2 Least-Cost Evaluation

Hydro has not identified any viable alternatives to facilitate a least-cost evaluation.

5.3 Recommended Alternative

Hydro is recommending the completion of the retrofits and purchases proposed as part of this program at its current pace. This will serve to address employee functionality and business adaptation requirements.

5.3.1 Risk of Asset Stranding

The spaces which comprise the scope of work under this program are critical to day-to-day operations and will remain in-service for the foreseeable future. Assets under this program have an inherently low risk of asset stranding.

5.3.2 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027 program in accordance with Hydro's Capital Risk Assessment process, as outlined in Section 7.0 of Schedule 1.

The outcome of this assessment is provided in Table 1.

Table 1: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	2	4	**8**
Post-Implementation	2	1	**2**
		Risk Mitigated	**6**
		Risk Mitigated per $1 Million	**6.0**

6.0 Scope of Work

The scope of this program for 2027 is to modify office buildings, and purchase office furniture, fixtures and equipment for Hydro's offices. Office modifications and asset procurement may include new equipment to address obsolete or deteriorated equipment, or purchases of capital spares. The office retrofit allowance shall be utilized for work related to organizational structure changes and growth and justified unforeseen requests to accommodate departmental or individual employee needs. The program also includes internal labour engineering costs to manage project cost, quality and schedule.

The program scope for 2027 includes:

- Retrofit of office and meeting room spaces in Hydro Place to provide adequate space for diversifying business needs such as organizational changes and ergonomic supports;
- Retrofit of Meter Shop in Hydro Place to facilitate in-house training, testing, and troubleshooting; and
- Retrofits to the existing Wabush Terminal Station office to accommodate departmental growth.

6.1 Program Budget

The estimate for the 2027 program is shown in Table 2.

Table 2: Program Estimate ($000)

Program Cost	2027	2028	Beyond	Total
Material Supply	368.6	0.0	0.0	**368.6**
Labour	168.6	0.0	0.0	**168.6**
Consultant	0.0	0.0	0.0	**0.0**
Contract Work	333.9	0.0	0.0	**333.9**
Other Direct Costs	0.0	0.0	0.0	**0.0**
Interest and Escalation	27.7	0.0	0.0	**27.7**
Contingency	93.6	0.0	0.0	**93.6**
Total	**992.4**	**0.0**	**0.0**	**992.4**

Chart 1 provides the historical expenditures, the forecast 2026 expenditures, the proposed 2027 program budget, and the forecast costs through 2031. This program will inherently show variability depending on the amount and type of work addressed each year. Forecast costs for 2028–2031 are an average of the actual and forecast expenditures for 2025–2027, with escalation applied.

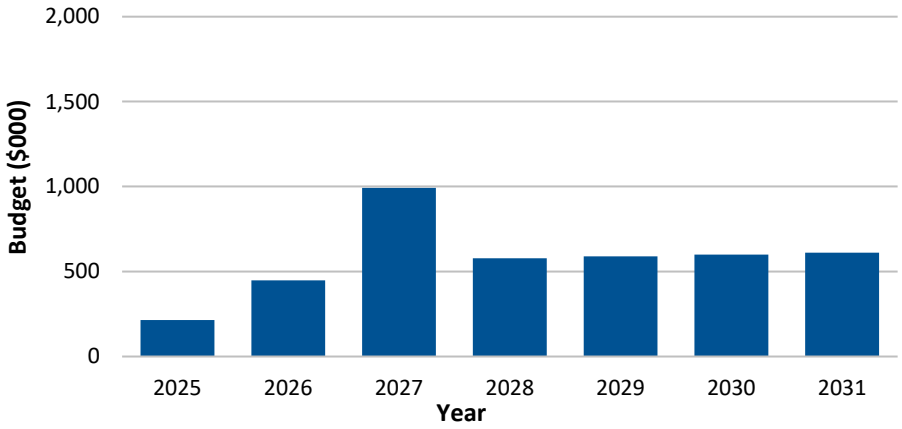


Chart 1: Historical and Forecast Program Budget

6.2 Program Schedule

The program is for performing office retrofits and the purchase and delivery of furniture, fixtures and equipment in 2027. There are no known construction or outage requirements; therefore, the milestone for the project is to have the items delivered on-site or work completed before December 31, 2027.

7.0 Conclusion

Existing furniture and equipment assets have an average lifespan of approximately 20 years; as such, unanticipated failures and deterioration of these assets are likely to occur. This program allows for the immediate capital refurbishment and replacement work required in such cases. Office retrofits are typically driven by changes in the organizational structure, which requires spatial changes in the physical environment, or individual health and wellness needs. In 2027, this will encompass the retrofit of office and meeting room spaces, as well as the meter shop, to facilitate training requirements. Hydro recommends completing office retrofits and replacing office furniture and equipment as required to maintain the reliability of business operations. Any delay of replacing existing equipment that has failed or is under performing, or accommodating the needs of the changing business, has the potential to disrupt business operations or performance levels.

Upgrade Energy Management System

(2027–2028)

Hydro Place



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Upgrade Energy Management System (2027–2028)

Location: Hydro Place

Investment Classification: General Plant

Asset Category: Information Systems

Estimated Cost: $761,700

1.0 Introduction

Newfoundland and Labrador Hydro ("Hydro") maintains the Energy Management System ("EMS") used by the Newfoundland & Labrador System Operator ("NLSO") to oversee and manage the provincial transmission grid and Hydro's generation facilities, ensuring reliable grid performance. This program proposes an upgrade to the EMS software to address security vulnerabilities, apply bug fixes and introduce improved functionality.

2.0 Program Description and Justification

The EMS, commissioned in 2006, provides a critical function and is essential to the continued efficient and reliable operation of the Island Interconnected System and a portion of the Labrador Interconnected System.[1] Failure to maintain this software creates the risk of unplanned system outages that could impact Hydro's ability to monitor and control the transmission grid and generation facilities, as well as create cybersecurity vulnerabilities.

From 2007 to 2017, the software was upgraded annually. Following discussions with the vendor, and in consideration of the system's size, complexity, and the significant effort required to complete each upgrade, the upgrade cycle was adjusted to two years. The EMS remains in a strong operational condition due to consistent, scheduled software upgrades that have supported its consistent availability and reliable performance. These upgrades and enhancements are driven by ongoing technology advancements and new version releases from the vendor.

This program proposes an EMS software upgrade to mitigate security vulnerabilities, implement bug fixes, and introduce enhanced functionality on a two-year cycle. This upgrade is planned for

[1] The NLSO relies on the EMS for around the clock monitoring and control of the transmission grid and Hydro's generation infrastructure.

implementation in 2028, in line with the established two-year upgrade cycle; however, the planning and design stages of the program must begin in 2027 in order to meet required timelines.

3.0 Analysis

3.1 Evaluation of Alternatives

Hydro has evaluated the following alternatives:

- Pace reduction;
- Pace advancement; and
- Continuation of program at current pace.

3.1.1 Pace Reduction

Historically, software upgrades associated with EMS were executed annually. In 2017, following discussions with the vendor, and considering the system's size, complexity, and the significant effort required to complete each upgrade, it was determined that a biannual upgrade cycle was optimal to meet system requirements and mitigate cybersecurity risks.

Further pace reduction is not a viable option, as it reduces cost efficiency, strains resources, and increases operational risks. Based on vendor experience, validated by Hydro, further increasing time between upgrades will result in increased issues and challenges, such as limited performance improvements and increased cybersecurity risks.

3.1.2 Pace Advancement

Based on previous annual upgrade experience, pace advancement is not a viable option due to the significant size, complexity, and cost associated with completing each upgrade.

3.1.3 Continuation of Program at Current Pace

The current two-year upgrade schedule balances the requirement to maintain system security, reliability and support while managing the significant effort, cost, and resource requirements associated with each upgrade. The two-year cycle ensures timely access to essential enhancements, while allowing sufficient time for planning, testing, and implementation. The EMS is a specialized, vendor-supported platform that requires ongoing updates to remain functional, secure, and compatible with industry standards. As

a result, maintaining the current program pace provides the optimal balance of system performance, risk management, and organizational efficiency.

3.2 Least-Cost Evaluation

Hydro has not identified any viable alternatives to facilitate a least-cost evaluation.

3.3 Recommended Alternative

As the EMS is a critical and foundational function to system reliability, continuing the scheduled two-year upgrade cycle is the recommended alternative to maintain system security, performance, and reliability at the level required to safely operate the provincial electrical grid.

3.3.1 Risk of Asset Stranding

The EMS is a critical operational application tightly integrated with Hydro's transmission and generation operations, and its software, hardware, and communication components are designed to work together as a unified system to support the provincial electrical grid 24-hours a day. As a result, the risk of asset stranding is low.

3.3.2 Risk Mitigation

Hydro assessed the pre- and post-implementation risk of the scope of work for the 2027–2028 program in accordance with Hydro's Capital Risk Assessment process, as outlined in Section 7.0 of Schedule 1. The outcome of this assessment is provided in Table 1.

Table 1: Risk Scoring Pre- and Post-Implementation

	Impact	Likelihood	Score
Pre-Implementation	4	4	**16**
Post-Implementation	4	2	**8**
		Risk Mitigated	**8**
		Risk Mitigated per $1 Million	**10.5**

4.0 Scope of Work

The 2027–2028 program involves upgrading the EMS to the latest available software release. This new release will include cybersecurity enhancements, bug fixes, and feature improvements. As the vendor does not provide detailed release notes until several months before the upgrade's commissioning, the final scope of work will be confirmed during the program's planning and design phases.

4.1 Program Budget

The estimate for this program is shown in Table 2.

Table 2: Program Estimate ($000)[2]

Program Cost	2027	2028	Beyond	Total
Material Supply	0.0	0.0	0.0	**0.0**
Labour	71.6	75.3	0.0	**146.9**
Consultant	10.1	10.1	0.0	**20.3**
Contract Work	250.5	249.5	0.0	**500.0**
Other Direct Costs	0.0	0.0	0.0	**0.0**
Interest and Escalation	10.4	17.4	0.0	**27.8**
Contingency	33.2	33.5	0.0	**66.7**
Total	**375.9**	**385.8**	**0.0**	**761.7**

Chart 1 provides five-year historical expenditures, forecasted 2026, proposed 2027–2028 budget, and forecast costs through 2031. The 2025 actual expenditures are lower due to unplanned, prolonged contract negotiations with the vendor that delayed the start of the EMS upgrade work originally scheduled for that year. As a result, a significant portion of the 2025 budget was not utilized as planned and was subsequently carried forward to 2026 to support the revised execution timeline.

Increased budget for the 2027–2028 program compared to previous years is primarily attributed to changes in the vendor's delivery model. Historically, the EMS was supported through a single, sole-sourced vendor, which provided predictable pricing and a consistent approach to upgrade execution. The vendor has since transitioned to a partnered vendor model, introducing multiple third-party service providers into the upgrade process. As observed through execution of the 2025–2026 upgrade, this shift has resulted in higher and more variable pricing, as well as additional coordination and integration costs to secure the necessary expertise and ensure timely delivery.

[2] Numbers may not add due to rounding.

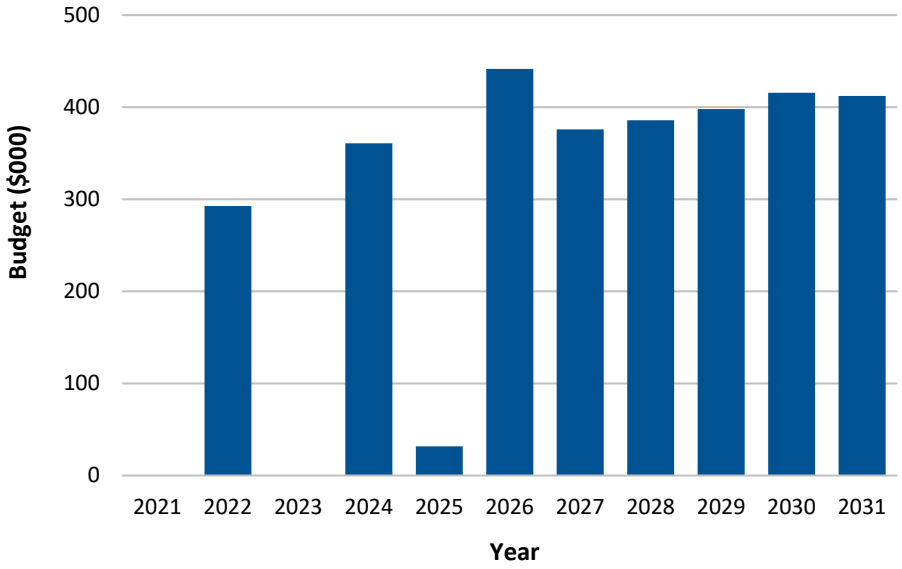


Chart 1: Historical and Forecast Program Budget[3]

4.2 Program Schedule

The schedule for the 2027–2028 program is shown in Table 3.

Table 3: Program Schedule

Activity	Start Date	End Date
Planning	January 2027	March 2028
Implementation	April 2027	June 2028
Closeout	September 2028	December 2028

5.0 Conclusion

Hydro completes EMS upgrades to address security vulnerabilities, resolve software issues, and enhance system functionality. These upgrades are essential to maintaining the reliable operation of the Interconnected System. If the EMS software is not maintained, Hydro faces an increased risk of unplanned outages that could compromise the monitoring and control of the transmission grid and associated generation facilities.

[3] Upgrades were not executed in 2021 and 2023 due to the bi-annual cycle.