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March 7, 2025

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

Attention: Jo-Anne Galarneau
Executive Director and Board Secretary

Re: ***Reliability and Resource Adequacy Study Review*** **– Holyrood Thermal Generating Station Capital Plan Refresh**

On March 31, 2022, Newfoundland and Labrador Hydro ("Hydro") filed the "Assessment to Determine the Potential Long-Term Viability of the Holyrood Thermal Generating Station" report ("2022 Report"). Completed by Hatch Ltd. ("Hatch") on behalf of Hydro, the report assessed the condition of the Holyrood Thermal Generating Station ("Holyrood TGS") assets, studied the viability of continued operation either in full generation mode or as a standby generating resource, and provided a capital plan and associated costs to support the operation of the plant through 2030.

On October 12, 2023, Hydro received correspondence from the Board of Commissioners of Public Utilities ("Board") requesting that Hydro extend the study period to assess the operation of the Holyrood TGS beyond 2030 for a reasonable time period to understand the implications of operating the plant beyond that date. Hydro engaged Hatch to review and update the sustaining capital plan and the plant operating cost estimate prepared as part of the Life Extension Condition Assessment in 2021, based on original equipment manufacturer condition assessments and operational experience of the plant from the last three years and to extend the analysis to 2035. The results of this update are summarized in Table 1.

Table 1: Holyrood TGS – Baseload[1] Operation to December 31, 2035 ($000)

Cost Type	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Capital Cost	33,687	51,913	27,052	14,642	13,113	17,934	24,650	33,305	33,138	32,776	10,617	**292,827**
Operating Cost	25,837	26,612	27,410	28,233	29,080	29,952	30,851	31,776	32,730	33,711	34,723	**330,915**
Total	**59,524**	**78,525**	**54,462**	**42,875**	**42,193**	**47,886**	**55,501**	**65,081**	**65,868**	**66,487**	**45,340**	**623,742**

Capital costs for 2025–2030, inclusive, have increased by approximately $44 million compared to those presented in the 2022 Report. The additional costs are attributed to the increase in the costs of equipment and services due to inflation since 2021 and include additional recommended projects based on findings from recent inspections. Capital projects were identified and organized by unit, synchronous condenser, and common facilities. The completed Hatch report is provided as Attachment 1.

[1] Baseload is to operate a generating unit at a minimum permissible capacity to ensure reliable operation. For example, Holyrood TGS units are operated a baseload of 70 MW each.

In addition to the updated capital and operating plans completed by Hatch, Hydro revised its fuel cost projections, assuming baseload operation through 2035, without the addition of new generating resources. Annual projected fuel costs are provided in Table 2.

Table 2: Annual Fuel Cost Projection – Baseload Operation to December 31, 2035 ($000)

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Fuel Cost	80,880	74,708	69,082	70,680	72,149	73,051	77,411	79,133	80,858	84,371	89,500

In March 2025, Hydro will file an application with the Board for the addition of new generation assets, namely an eighth unit at the Bay d'Espoir Hydroelectric Generating Facility, and a Combustion Turbine on the Avalon Peninsula. These assets, once in service and demonstrated to be reliable, are expected to enable the retirement of steam generation at the Holyrood TGS and transition to synchronous condenser operation. The results of the Holyrood TGS condition assessment provide valuable insight into the capital asset renewal and maintenance investments required for the continued operation of the Holyrood TGS through the Bridging Period.[2] Hydro will utilize this analysis to inform its capital plan for the Holyrood TGS for the period in which it is required until new generation is brought online and proven reliable.

Should you have any questions or comments about any of the enclosed, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO

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

Encl.

ecc:

Board of Commissioners of Public Utilities
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Dominic J. Foley
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[2] The Bridging Period is the period of sustaining existing thermal generation to maintain reliability while new generation capacity is being built. The Bridging Period is defined as the period from 2023 to 2030.

Newfoundland and Labrador Hydro
Holyrood Plant Capital Plan Refresh

HTGS 2025 Capital Refresh Report

PROVINCE OF NEWFOUNDLAND
PEGNL Newfoundland and Labrador
PERMIT HOLDER
CLASS "A"
This Permit Allows
HATCH LTD.
MIRC # 06735
To practice Professional Engineering
in Newfoundland and Labrador
Permit No. as issued by PEG-NL 00090
which is valid for the year 2025

LICENSED PROFESSIONAL ENGINEER
10710
SCOT G. DEYOUNG
SIGNATURE
5/3/25
DATE
NEWFOUNDLAND & LABRADOR

			Habib, Saleha	DeYoung, Scot	Meghari, Karim
2025-03-04	0	Issued for Use	S. Habib K. Akhtar	S. DeYoung	K. Meghari
Date	**Rev.**	**Status**	**Prepared By**	**Reviewed By**	**Approved By**
HATCH					

Revision Control

Date	Rev. No	Description	Revised By
2024-10-04	A	Preliminary	
2025-01-09	B	Client Review	
2025-02-20	C	Client Review	
2025-03-04	0	Issued for Use	

Disclaimer

This report, including the assessment contained herein, has been prepared by Hatch Ltd. ("Hatch") for the sole and exclusive use of Newfoundland and Labrador Hydro (the "Client") for the purpose of assisting the Client in making decisions with respect to updating the Capital Plan and O&M cost of the Holyrood Thermal Power Station (HTGS). Any use of or reliance upon this report by another person is at their sole risk and Hatch does not accept any responsibility or liability in connection with that person's use or reliance.

This report contains the expression of the opinion of Hatch using its professional judgment and reasonable care based upon information available and conditions existing at the time of preparation of this report, and information made available to Hatch by the Client or by certain other parties on behalf of the Client (the "Client or Other Information").

The use of or reliance upon this report is subject to the following:

1. *This report is to be read in the context of and is subject to the terms of the relevant Purchase Order PO 9083 OS, dated 04 July 2024 between Hatch and the Client (the "Agreement"), including any methodologies, procedures, techniques, assumptions, and other relevant terms or conditions specified in the Hatch Agreement.*
2. *This report, including the assessment contained herein, is meant to be read as a whole, and sections of the report must not be read or relied upon out of context; and*
3. *Unless expressly stated otherwise in this report, Hatch has not verified the accuracy, completeness, or validity of any information provided to Hatch by or on behalf of the Client and Hatch does not accept any liability in connection with such information.*
4. *This report presents the capital expenditure information currently available to Hatch. Given the age of the facility, unforeseen capital expenditures may arise that are not included herein. Should such expenditures occur, it is recommended that they be addressed individually through the established Newfoundland and Labrador Hydro (NLH) capital approval program.*
5. *The condition, stability and safety of the facility has been assessed based on the data available on or before December 10th, 2024. This may change over time (or may have already changed) due to natural forces or human intervention, and Hatch does not accept any responsibility for the impact that such changes may have on the accuracy or validity of the opinions, conclusions, and recommendations set out in this report.*

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1.1 Holyrood Thermal Generating Station

Newfoundland and Labrador Hydro (NLH) is transitioning to lower emission power generation with its investment in additional hydroelectric capacity, clean energy technologies, and reinforced transmission systems. The planned additional generation will reduce the baseload need for power generated at the Holyrood Thermal Generating Station (HGTS).

The Life Extension Condition Assessment (LECA) study and sustaining capital expenditure plan developed by Hatch in 2022 was based on the planned retirement of HTGS Unit 1 and Unit 2 and the conversion of Unit 3 to permanent synchronous condensing operation in 2030. The sustaining capital plan recommended capital works to ensure the availability of the HTGS for the planned remaining years of operation.

The purpose of this study is to understand the costs of extending the retirement from 2030 to 2035 should the plant be required longer. In addition, the update includes a review and update of the sustaining capital plan and the plant O&M cost estimate prepared as part of LECA in 2021, based on OEM condition assessments and operational experience of the plant from the last 3 years.

The recommendations and costs are based on all three units being maintained to permit high availability and reliability and be fully capable of full load if dispatched.

1.2 Capital Costs

The annual capital cost from 2025 to 2035 to operate the HTGS as a baseload facility is summarized in Table 1-1.

Table 1-1: Capital Plan for Baseload Operation 2025-2035*

HTGS Capital Plan (2025-2030) – Baseload Operation to Dec 31, 2035 (1000 CAD)												
Unit	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**Total**
Unit 1	2,900	11,433	8,137	2,513	2,589	7,303	3,522	3,751	21,877	3,001	3,091	70,117
Unit 2	2,300	15,605	3,013	2,513	6,809	3,536	2,746	21,806	3,192	3,001	3,091	67,612
Unit 3	22,987	11,485	4,636	7,212	2,589	2,666	8,000	2,829	5,130	21,555	3,091	92,180
Synchronous Condenser	-	-	1,591	983	-	2,319	-	-	-	-	-	4,893
Common Facilities	5,500	13,390	9,675	1,421	1,126	2,110	10,382	4,919	2,939	5,219	1,344	58,025
Annual Total	33,687	51,913	27,052	14,642	13,113	17,934	24,650	33,305	33,138	32,776	10,617	**292,827**

**Costs are escalated from 2025 at a rate of 3% per annum*

Capital costs for 2025-2030 inclusive have increased by $44,315,639 compared to the original 2022 LECA. The costs are attributed to the increase in the costs of equipment and services due to inflation since 2021 and include additional projects recommended and based on findings from recent inspections.

The increase in cost per unit is as follows:

- Unit 1: $3,981,472
  - $(4,383,428) – overall reduction of previously identified Projects based on a review of recent annual expenditures for example a reduction in the allowance for in-service failures from $2M to $1M;
  - $8,364,900 - additional cost of newly recommended Projects.
- Unit 2: $11,808,842
  - $4,289,842 – overall increase for previously identified projects due to increase for pumps, turbine, and turbine major valves overhauls;
  - $7,519,000 - additional cost of newly recommended Projects.
- Unit 3 : $6,230,632
  - $(930,095) - overall reduction for previously identified projects due to reduction in allowance for in-service failures and the separation of scope associated with synchronous condenser;
  - $7,160,727- additional cost of newly recommended Projects.
- Common Facilities : $17,401,341
  - $14,326,341 - additional cost of previously identified Projects mainly attributed to increases in plant heating system and fuel tank refurbishment cost;
  - $3,075,000 - additional cost of newly recommended Projects.
- Synchronous condenser (Previously included in Unit 3)
  - $4,893,352 - additional cost of newly recommended Projects.

1.3 Operating Costs

The annual total cost which is inclusive of capital cost, and operating cost is summarized in Table 1-2.

Table 1-2: Operating Costs for Baseload Operation 2025 – 2035 (1000 CAD)*

	Operating
2025	25,837
2026	26,612
2027	27,410
2028	28,233
2029	29,080
2030	29,952
2031	30,851
2032	31,776
2033	32,730
2034	33,711
2035	34,723
Total	**330,915**

** Operating Costs are escalated from 2025 at a rate of 3% per annum.*

The Operating forecast does not include opportunities for Capital Recharge.

1.4 Total Cost

The annual total cost which is inclusive of capital cost, and operating cost is summarized in Table 1-3.

Table 1-3: Total Cost for Plant Operation 2025-2035*

HTGS Capital Plan (2025-2030) – Baseload Operation to Dec 31, 2035 (1000 CAD)												
Cost Type	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Capital Cost	33,687	51,913	27,052	14,642	13,113	17,934	24,650	33,305	33,138	32,776	10,617	292,827
Operating Cost	25,837	26,612	27,410	28,233	29,080	29,952	30,851	31,776	32,730	33,711	34,723	330,915
Yearly Totals	59,524	78,525	54,462	42,875	42,193	47,886	55,501	65,081	65,868	66,487	45,340	623,742

2. Introduction

2.1 Background

HTGS consists of three units which can generate a total of 500 MW. Units 1 and 2 were commissioned in 1969/1970, with a capacity of 150 MW each and were upgraded in 1988 and 1989 to 175 MW. Unit 3 was commissioned in 1979 and can produce 150 MW and is also capable of operating in synchronous condenser mode to provide voltage regulation.

When all three units are operating at the maximum continuous rating (MCR), HTGS can supply approximately 20% of the Island Interconnected System demand. Typically, the plant is only required to operate and supply power during the winter months from October to March.

The load profile considered for this study is summarized in Table 2-1.

Table 2-1: Load Profile (2025 onwards)

Month	No. of Units
September	0
October	0.5
November	1
December	2
January	2
February	2
March	1
April	0

The load profile requires one or two units online at minimum load.

3. Methodology

The Capital Plan developed as part of the 2021 Life Extension Condition Assessment (LECA) was updated based on the following:

- Review of annual capital costs and actual cost provided in carryover reports post 2021.
- Refurbish expenses for recent equipment failures and unplanned forced outages.
- The condition of key assets as per inspection reports.
- Recommendations from OEMs.

- Information collected during the August 2024 Site Visit through:
  - Visual observations of asset condition.
  - Discussions with operating staff.

The O&M Cost Estimate developed as part of the 2022 LECA was updated based on the following:

- Operating cost expenditures from 2024.
- Annual load profile per Table 2-1.

Appendix A contains the detailed list of the documents provided by NLH.

4. Capital Plan Update

The following projects are considered as sustaining capital projects to ensure safety and reliable operation of the plant. All cost estimates/allowances are exclusive of any owner's cost such as NL Hydro's internal labour cost, overheads, etc.

4.1 Unit 1

4.1.1 Boiler Condition Assessment and Miscellaneous Refurbishment

Given the age of the plant, the boiler requires an inspection and condition assessment during the annual outage to maintain reliability. This inspection will identify components that need to be refurbished during the outage.

In the 2022 LECA, an annual allowance of $1.0M was included for this work. Based on the actual costs from 2021 through 2023, this report recommends the allowance be increased to $1.3M.

4.1.2 Unforeseen Failures and Latent Issues

The plant is operating well beyond its intended design life and the planned retirement has been extended numerous times. Refurbishments needed to keep the plant operational have been confined to those essential for ensuring safe operation and bringing the unit online. It is expected that as the unit continues to operate these types of failures will continue.

The 2022 LECA included an annual allowance of $2.0M/unit for unforeseen failures. Based a on review of the actual expenditures this report recommends reducing this allowance to $1.0M.

4.1.3 Flame Scanners

The existing FS-200 flame scanner system is obsolete, and the OEM has stopped supplying services for these devices. Flame scanners are critical component of the system, ensuring safety of the furnace by monitoring combustion. Therefore, it is recommended to replace these flame scanners to maintain safety.

This project is planned for 2025 therefore it is added to the LECA with an allowance of $300K.

4.1.4 Lower Slope Waterwalls

The 2022 Condition Assessment Report performed by the OEM recommended additional inspections in 2023/24 and replacement in 2026, based on the rate of wall thinning and observed damage. This recommendation is based on the observed rate of wall thinning with the criteria to replace at <70%MWT. It takes approximately 7 to 10 days to refurbish a tube leak before the unit can be brought back online.

It is recommended the lower slope be replaced to maintain reliability and reduce future forced outages and refurbishment cost. This report therefore recommends a new project be included in the LECA for 2026 for these replacements with an estimated cost of $5M.

4.1.5 Boiler Stop Valve

This valve had failed in 2018 and as a temporary measure to get the unit back online the valve was removed, and a balancing weight was used to mimic the stress on the pipe. This temporary solution was deployed as station was planned to be retired in 2019. The retirement has been extended and this temporary solution has not been rectified creating operational problems. For example, the boiler can not be isolated due to absence of this valve, requiring both the boiler and turbine to be shut down entirely to perform work on either one. Based on plant data, the financial impact of this temporary measure is an additional $30,000 in diesel costs per restart in addition to HFO costs to maintain drum pressure.

This report recommends a new project be included in the LECA for 2026 for a new boiler stop valve with an estimated cost of $0.5M.

4.1.6 Condensate and Feedwater Valves

Each unit has 12 valves that are used to regulate the condensate, make up water, and feedwater to condenser, LP and HP heaters and feedwater to the boiler drum. These valves were last inspected and overhauled in 2014. These valves have continued to leak and have resulted in unit deratings and forced outages in recent years. A valve overhaul is required to extend to the life of these valves and prevent future derating or forced outages.

This report recommends a new project be included in the LECA for 2027 to overhaul these valves with an allowance of $1M based on cost data from a recent project carried out by Hatch.

4.1.7 Condenser

GE conducted eddy current testing on the condenser tubes and a general inspection of the condenser support structure in 2021. The condenser has a total of 7978 tubes of which 537 (6.7%) of tubes were tested with a focus on areas with higher damage potential. The test results showed tube defects in the range of 20% to 40% of the tubes tested. Approximately 300 tubes were found to be plugged. On the steam side, the tube bundles appeared to be in good condition.

Broken and eroded welds on supporting braces were also observed, which is not uncommon for aged units. Erosion on braces was significant but did not require any immediate action since the braces are welded on both sides and on the top and bottom.

This report recommends a new project be included in the LECA for 2026 to inspect and refurbish the condenser supports with an estimated cost of $0.5M based on inspection and overhaul work performed at the station in 2021.

4.1.8 Turbine

A Turbine inspection and overhaul was completed 2024. An overhaul is typically completed once every 9 years. This inspection and overhaul interval is based on the unit operating approximately 35,000 hours.

This report recommends an additional inspection and overhaul be included in the LECA in 2033 with an estimated cost of $11M based on the actual cost of a unit 2 turbine major overhaul carried out in 2023. This overhaul is scheduled assuming the unit is dispatched to operate for the entire season. Should the unit not operate at this frequency this work could be deferred and rescheduled to coincide with an accumulated 35000 hrs of operation.

4.1.9 Turbine Valves

Severe service valves such as main steam stop valves, reheat steam stop valves, and control valves require frequent maintenance typically every 3 years. The last overhaul was completed in 2024 s such, the next recommended overhaul will be in 2027, 2030 and 2033.

This report recommends an additional overhaul in 2030 and 2033 with an allowance of $3M for each overhaul based on the actual cost of Unit 3 turbine valves overhaul carried out in 2022.

4.1.10 Generator

A Generator inspection and overhaul was completed in 2024. An overhaul is typically completed once every 6 years, and includes all rotating parts, seals, and other mechanical components such as wedges, fan blades, bearings, hydrogen seals, and retaining rings.

This report recommends an additional overhaul in 2030 be included in the LECA for generator inspection and overhaul with an estimated cost of $1M based on the actual cost of Unit1 overhaul carried out in 2024.

4.1.11 HP Heaters

The status of the heaters is as follows:

- HP Heater 4: Unavailable;
- HP Heater 5: Overhauled; and
- HP Heater 6: Available.

HP Heaters 4 and 5 were inspected in 2024. Heater 4 had approximately 140 leaks and a large number of tubes below the minimum required thickness and therefore needs to be replaced. HP Heater 5 was overhauled and is now ready for service.

The boiler and turbine OEM's both recommend that the Heaters be in operation to ensure safe and reliable operation.

This report recommends a new project in 2026 be included in the LECA with an estimated cost of $1M for the replacement of HP Heater 4.

This report recommends a new project in 2025 be included in the LECA for the inspection and overhaul of HP Heater 6 with an allowance of $300K based on the actual cost for Unit 1 and Unit 2 HP heaters inspection carried out in 2024.

4.1.12 LP Heaters

The LP heaters have not been included in recent inspections and capital plans. As a result, they have not been inspected in over 10 years.

This report recommends a new project be included in the LECA for 2026 for the inspection of LP heaters using non-destructive testing and to plug the tubes identified with leak during inspection with a cost estimate of $300K based on the actual cost for Unit 1 and Unit 2 HP heaters inspection carried out in 2024.

4.1.13 Deaerator

In the 2022 LECA, an allowance of $300K was included for an internal inspection and NDE of the heater shell, feedwater, and steam piping and to perform any necessary overhaul of the deaerator components and its associated steam system in the year 2027.

This report recommends keeping this project as per 2022 LECA.

4.1.14 Pumps

The 2022 LECA report recommended the following overhaul frequency for major pumps:

- Feedwater Pumps – every 6 years; and
- Condensate extraction pumps (CEP), circulating water pumps (CWP), and vacuum pumps (VP) – every 12 years.

A review of the failure history of CEP, CWP, and VP indicates that failures are occurring within the 12-year maintenance cycle. It is therefore recommended to reduce the overhaul interval for these pumps to <12 years.

The carryover reports from 2021 to 2023 have shown failure of pump motors therefore, it is recommended to include the pump motor in the overhaul plan to reduce in-service failures of pump motors.

4.1.14.1 Boiler Feedwater Pumps

The east-side boiler feedwater pump (BFPE) was previously overhauled in 2021, and its next overhauls will be scheduled in 2027 and 2033.

The west-side boiler feedwater pump (BFPW) was previously overhauled in 2020, and its next overhaul will be scheduled for 2026 and 2032.

In the 2022 LECA, an annual allowance of $700K was included for this work. This report recommends the allowance be increased to $750K for each pump overhaul to include motor rewind.

4.1.14.2 Cooling Water Pumps

The east-side cooling water pump (CWPE) was previously overhauled in 2014, and its next scheduled overhaul will be in 2026.

The west-side cooling water pump (CWPW) was last overhauled in 2022, and its next scheduled overhaul will be in 2031.

In the 2022 LECA, an allowance of $400K was included for this work. This report recommends the allowance be increased to $430K for each pump overhaul to include motor rewind.

4.1.14.3 Condensate Extraction Pumps

The north-side condensate extraction pump (CEPN) was previously overhauled in 2015, and its next scheduled overhaul will be scheduled for 2027.

The south-side condensate extraction pump (CEPS) was previously overhauled in 2014, and its next scheduled overhaul will be scheduled for 2026.

In the 2022 LECA, an allowance of $300K was included for this work. This report recommends the allowance be increased to $320K for each pump overhaul to include motor rewind.

4.1.14.4 Vacuum Pumps

The north side vacuum pump (VPN) was previously overhauled in 2022, and its next scheduled overhaul will be in 2031.

The south side vacuum pump (VPS) was previously overhauled in 2024, and its next scheduled overhaul will be in 2033.

In the 2022 LECA, an allowance of $200K was included for this work. This report recommends the allowance be increased to $220K for each pump overhaul to include motor rewind.

4.1.15 Capital Plan

The following is a matrix of planned work.

Table 4-1: Capital Plan Matrix (Unit 1)*

	Description	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Boiler Condition Assessment	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R
2	Unforeseen Failures & Latent Issues	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R
3	Flame Scanners	R										
4	Lower Slope Waterwalls		R									
5	Boiler Stop Valve		R									
6	Condensate & Feedwater Valves			O								
7	Condenser		I/O									
8	Turbine									O		
9	Turbine Valves			O			O			O		
10	Generator						O					
11.1	HP Heater 4		R									
11.2	HP Heater 6	I/O										
12	LP Heaters		I									
13	Deaerator			I/O								
14	Major Pump Overhaul											
14.1.1	BFPE			O						O		
14.1.2	BFPW		O						O			
14.2.1	CWPE		O									
14.2.2	CWPW							O				
14.3.1	CEPN			O								
14.3.2	CEPS		O									

	Description	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
14.4.1	VPN							O				
14.4.2	VPS									O		

*O: Overhaul; R: Replacement or New addition; I: Inspection

4.2 Unit 2

4.2.1 Boiler Condition Assessment and Miscellaneous Refurbishments

Given the age of the plant, the boiler requires an inspection and condition assessment during the annual outage to maintain reliability. This inspection will identify components that need to be refurbished during the outage.

In the 2022 LECA, an annual allowance of $1.0M was included for this work. Based on the actual costs from 2021 through 2023, this report recommends the allowance be increased to $1.3M.

4.2.2 Unforeseen Failures and Latent Issues

The plant is operating well beyond its intended design life and the planned retirement has been extended numerous times. Refurbishments needed to keep the plant operational have been confined to those essential for ensuring safe operation and bringing the unit online. It is expected that as the unit continues to operate these types of failures will continue.

The 2022 LECA included an annual allowance of $2.0M/unit for unforeseen failures. Based a on review of the actual expenditures this report recommends reducing this allowance to $1.0M.

4.2.3 Boiler Stop Valve

The main steam stop valve was replaced in 2007. The valve refurbishment was removed from the capital plan in 2018 as the plan was to retire the station.

For continued operation, an overhaul of the main steam stop valve is recommended to reduce the risk of steam leaks or valve failure which would result in a forced outage. Boiler side valve inspections and refurbishment is recommended along with turbine major valves overhauls.

This report recommends a new project be included in the LECA for 2026 with an allowance of $400K based on recent similar work performed.

4.2.4 Lower Slope Waterwalls

The 2022 Condition Assessment Report performed by the OEM recommended additional inspections in 2023/2024 and replacement in 2026, based on the rate of wall thinning and observed damage. This recommendation is based on the observed rate of wall thinning with

the criteria to replace at <70%MWT. It takes approximately 7 to 10 days to refurbish a tube leak before the unit can be brought back online.

It is recommended the lower slope be replaced to maintain reliability and reduce forced outages and refurbishment cost. This report therefore recommends a new project be included in the LECA for 2026 for these replacements with an estimated cost of $5M.

4.2.5 Condensate and Feedwater Valves

Each unit has 12 valves that are used to regulate the condensate, make up water, and feedwater to condenser, LP and HP heaters and feedwater to the boiler drum. These valves were last inspected and overhauled in 2014. These valves have continued to leak and have resulted in unit deratings and forced outages in recent years. A valve overhaul is required to extend to the life of these valves and prevent future derating or forced outages.

This report recommends a new project be included in the LECA for 2026 to overhaul these valves with an allowance of $1M based on cost data from a recent project carried out by Hatch.

4.2.6 Condenser

GE conducted an eddy current testing on condenser tubes and general inspection of condenser support structure in 2021. The condenser has a total of 7978 tubes of which 280 (3.5%) of tubes were tested with a focus on areas with higher damage potential. The test results showed tube defects in the range of 20% to 50% of the tubes tested. A total of 381 tubes were mechanically plugged to avoid leakage and one tube was obstructed. Broken/eroded welds were noted on the bundle supports on cross braces that extend horizontally between the tube support plates of the two bundles. Damage of floor coating was noted in the Northeast, Northwest, and Southwest corners.

This report recommends a new project be included in the LECA for 2026 to inspect and refurbish the condenser supports with an estimated cost of $0.5M based on recent inspection and overhaul work performed at station in 2021.

4.2.7 Turbine

A Turbine inspection and overhaul was completed in 2023. An overhaul is typically completed once every 9 years. This inspection and overhaul interval is based on the unit operating approximately 35,000 hours.

This report recommends an additional inspection and overhaul be included in the LECA in 2032 with an estimated cost of $11M based on the actual cost of a unit 2 turbine major overhaul carried out in 2023. This overhaul is scheduled assuming the unit is dispatched to operate for the entire season. Should the unit not operate at this frequency this work could be deferred and rescheduled to coincide with an accumulated 35000 hrs of operation.

4.2.8 Turbine Valves

Severe service valves such as main steam stop valves, reheat steam stop valves, and control valves require frequent maintenance typically every 3 years. As such, the next recommended overhaul will be in 2026 and 2029.

This report recommends an additional overhaul in 2032, with an allowance of $3M for each overhaul based on the actual cost of Unit 3 turbine valves overhaul carried out in 2022.

4.2.9 Generator

A Generator inspection and overhaul was recently completed in 2020. An overhaul is typically completed once every 6 years, and includes all rotating parts, seals, and other mechanical components such as wedges, fan blades, bearings, hydrogen seals, and retaining rings. As such, the next recommended overhaul will be in 2026.

This report recommends an additional generator inspection and overhauls in 2032 be included in the LECA with an estimated cost of $1M for each inspection and overhaul based on the actual cost of Unit1 overhaul carried out in 2024.

4.2.10 HP Heaters

The current HP heaters were originally replaced after the first 20 years of operation and currently are 39 years old.

The status of the heaters is as follows:

- HP Heater 4: Available;
- HP Heater 5: Available; and
- HP Heater 6: Unavailable.

HP Heaters 4 and 5 are operational and HP Heater 6 has shown operational issues in the past. At low loads (approx. 50 MW), this heater is automatically bypassed. The condition of the other two heaters is not known. As such, it is recommended to perform non-destructive testing (NDT) using the eddy current method for all three HP heaters and to subsequently perform the required overhaul.

The boiler and turbine OEM's both recommend that the Heaters be in operation to ensure safe and reliable operation.

This report recommends a new project in 2026 be included in the LECA for the inspection and overhaul of all three HP heaters with an allowance of $600K based on the actual cost for Unit 1 and Unit 2 HP heaters inspection carried out in 2024.

4.2.11 LP Heaters

The LP heaters have not been included in recent inspections and capital plans. As a result, they have not been inspected in over 10 years.

This report recommends a new project be included in the LECA for 2026 for the inspection of LP heaters using non-destructive testing and to plug the tube leaks with a cost estimate of

$300K based on the actual cost for Unit 1 and Unit 2 HP heaters inspection carried out in 2024.

4.2.12 Deaerator

In the 2022 LECA, an allowance of $300K was included for an internal inspection and NDE of the heater shell, feedwater piping and nozzles, and steam piping to the deaerator and to perform any necessary overhaul of the deaerator components and its associated steam system in the year 2026.

This report recommends keeping this project as per 2022 LECA.

4.2.13 Pumps

The 2022 LECA report recommended the following overhaul frequency for major pumps.

- Feedwater Pumps – every 6 years.
- Condensate extraction pumps (CEP), circulating water pumps (CWP), and vacuum pumps (VP) – every 12 years.

A review of the failure history of CEP, CWP, and VP indicates that failures are occurring within the 12-year maintenance cycle. It is therefore recommended to reduce the overhaul interval for these pumps to <12 years.

The carryover reports from 2021 to 2023 have shown failure of pump motors therefore, it is recommended to include the pump motor in the overhaul plan to reduce in-service failures of pump motors.

4.2.13.1 Boiler Feedwater Pumps

The east-side boiler feedwater pump (BFPE) was previously overhauled in 2024, and its next overhaul will be scheduled in 2030.

The west-side boiler feedwater pump (BFPW) was previously overhauled in 2023, and its next overhaul will be scheduled in 2029.

In the 2022 LECA, an annual allowance of $700K was included for this work. This report recommends the allowance be increased to $750K for each pump overhaul to include motor rewind.

4.2.13.2 Cooling Water Pumps

The east-side cooling water pump (CWPE) was previously overhauled in 2016, and its next overhaul will be scheduled for 2026.

The west-side cooling water pump (CWPW) was previously overhauled in 2023, and its next scheduled overhaul will be in 2032.

In the 2022 LECA, an allowance of $400K was included for this work. This report recommends the allowance be increased to $430K for each pump overhaul to include motor rewind.

4.2.13.3 *Condensate Extraction Pumps*

The north-side condensate extraction pump (CEPN) was previously overhauled in 2016, and its next scheduled overhaul will be in rescheduled for 2027.

The south-side condensate extraction pump (CEPS) was previously overhauled in 2014 and its next scheduled overhaul will be in 2026.

In the 2022 LECA, an allowance of $300K was included for this work. This report recommends the allowance be increased to $320K for each pump overhaul to include motor rewind.

4.2.13.4 *Vacuum Pumps*

The north side vacuum pump (VPN) was previously overhauled in 2024, and its next scheduled overhaul will be in 2033.

The south side vacuum pump (VPS) was previously overhauled in 2018, and its next scheduled overhaul will be in 2027.

In the 2022 LECA, an allowance of $200K was included for this work. This report recommends the allowance be increased to $220K for each pump overhaul to include motor rewind.

4.2.14 *Capital Plan Matrix*

Table 4-2: Capital Plan Matrix (Unit 2)*

	Description	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Boiler Condition Assessment	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R
2	Unforeseen Failures & Latent Issues	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R
3	Boiler Stop Valve		O									
4	Lower Slope Waterwall		R									
5	Condensate and Feedwater Valves		O									
6	Condenser		I/O									
7	Turbine								O			
8	Turbine Valves		O			O			O			
9	Generator		O						O			

	Description	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
10.1	HP Heater 4		I/O									
10.2	HP Heater 5		I/O									
10.3	HP Heater 6		I/O									
11	LP Heaters		I									
12	Deaerator		I/O									
13	Major Pump Overhaul											
13.1.1	BFPE						O					
13.1.2	BFPW					O						
13.2.1	CWPE		O									
13.2.2	CWPW								O			
13.3.1	CEPN			O								
13.3.2	CEPS		O									
13.4.1	VPN									O		
13.4.2	VPS			O								

*O: Overhaul; R: Replacement or New addition; I: Inspection

4.3 Unit 3

4.3.1 Boiler Condition Assessment and Miscellaneous Refurbishments

Given the age of the plant, the boiler requires an inspection and condition assessment during the annual outage to maintain reliability. This inspection will identify components that need to be refurbished during the outage.

In the 2022 LECA, an annual allowance of $1.0M was included for this work. Based on the actual costs from 2021 through 2023, this report recommends the allowance be increased to $1.3M.

4.3.2 Unforeseen Failures and Latent Issues

The plant is operating well beyond its intended design life and the planned retirement has been extended numerous times. Refurbishment needed to make the plant operational have

been confined to those essential for ensuring safe operation and bringing the unit online. It is expected that as the unit continues to operate these types of failures will continue.

The 2022 LECA included an annual allowance of $2.0M/unit for unforeseen failures. Based a on review of the actual expenditures this report recommends reducing this allowance to $1.0M.

4.3.3 Flame Scanners

The existing FS-200 flame scanner system is obsolete, and the OEM has stopped supplying services for these devices. Flame scanners are critical component of the system, ensuring safety of the furnace by monitoring combustion. Therefore, it is recommended to replace these flame scanners to maintain safety.

This project is planned for 2025 therefore it is added to the LECA with an allowance of $300K.

4.3.4 Boiler Reheater

The results in 2019 Condition Assessment Report show that the wall thickness of the reheater section will be less than ASME minimum wall thickness requirement in 2026, based on the rate of wall thinning and observed damage.

It is recommended that the reheater section be replaced to maintain reliability and forced outages. This report therefore recommends a new project be included in the LECA for 2026 for these replacements with an estimated cost of $5M.

4.3.5 Condensate and Feedwater Valves

Each unit has 12 valves that are used to regulate the condensate, make up water, and feedwater to condenser, LP and HP heaters and feedwater to the boiler drum. These valves were last inspected and overhauled in 2014. These valves have continued to leak and resulted in unit deratings and forced outages in recent years. A valve overhaul is required to extend to the life of these valves and prevent future derating or forced outages.

This report recommends a new project be included in the LECA for 2028 to overhaul these valves with an allowance of $1M.

4.3.6 Condenser

GE conducted an eddy current testing on condenser tubes and general inspection of condenser support structure in 2021. The condenser has a total of 7984 tubes of which 537 (6.7%) of tubes were tested with a focus on areas with higher damage potential. Indication of ID Pitting and corrosion were found throughout the condenser at different tube lengths. The test results showed tube defects in up to 50% of tubes tested. Approximately 680 tubes were mechanically plugged to avoid leakage, and some were obstructed. On the steam side, the tube bundles appeared in good condition. Mineral deposits were noted on the north side of the south LP outlet area. The amount of deposit was not significant enough to be of any concern. Broken and eroded welds were observed throughout.

Considering the condition of the condenser, it is recommended to carry out the work recommended by the inspection reports.

This report recommends a new project be included in the LECA for 2026 to inspect and overhaul the condenser supports with a cost of $0.5M based on recent inspection and overhaul.

4.3.7 Turbine

An overhaul is typically completed once every 9 years. This inspection and overhaul interval is based on the unit operating approximately 35,000 hours.

A Turbine inspection and overhaul is planned to be completed in 2025 at a cost of $16M. This cost is higher than the normal turbine overhaul due to additional work on steam turbine chest crack repair.

This report recommends an additional inspection and overhaul be included in the LECA in 2034 with an estimated cost of $11M based on the actual cost of a unit 2 turbine major overhaul carried out in 2023. This overhaul is scheduled assuming the unit is dispatched to operate for the entire season. Should the unit not operate at this frequency this work could be deferred and rescheduled to coincide with an accumulated 35000 hrs of operation.

4.3.8 Turbine Valves

Severe service valves such as main steam stop valves, reheat steam stop valves, and control valves require frequent maintenance typically every 3 years. As such, the next recommended overhaul will be in 2025.

This report recommends additional overhauls in 2028, 2031, and 2034, with an allowance of $3M for each overhaul based on the actual cost of Unit 3 turbine valves overhaul carried out in 2022.

4.3.9 Turbine Governor Spares

The turbine governor is an aging mechanical governor – there is no spare available and the technology is obsolete. Units 1 and 2 were recently upgraded to the Mark VIe.

It is recommended to work with the OEM to identify critical spares and have them custom made locally so that in case of failure, the duration of a forced outage can be minimized.

This report recommends a new project included in the LECA for 2026 for turbine governor spares with an allowance of $2M.

4.3.10 Generator

The Generator was previously overhauled in 2021. An overhaul is typically completed once every 6 years, and includes all rotating parts, seals, and other mechanical components such as wedges, fan blades, bearings, hydrogen seals, and retaining rings. As such, the next recommended overhauls will be in 2027 and in 2033.

This report recommends the next generator inspection and overhauls in 2027 and in 2033 be included in the LECA with an estimated cost of $1M for each inspection and overhaul based on the actual cost of Unit1 overhaul carried out in 2024.

4.3.11 HP Heaters

The current HP heaters were originally replaced in 1997 and are approximately 27 years old.

The status of the heaters is as follows:

- HP Heater 4: Available;
- HP Heater 5: Available; and
- HP Heater 6: Unavailable.

The inspection and overhaul carried out on HP Heater 5 in 2024 noted that most of the tubes had pitting and a total of 11 tubes showing leakage were plugged.

The boiler and turbine OEM's both recommend that the Heaters be in operation to ensure safe and reliable operation.

This report recommends a new project be included in the LECA for 2025 for HP Heater 6 and 2026 for HP Heater 4 inspections and overhaul with an allowance of $300K based on the actual cost for Unit 1 and Unit 2 HP heaters inspection carried out in 2024.

4.3.12 LP Heaters

The LP heaters have not been included in recent inspections and capital plans. As a result, they have not been inspected in over 10 years.

This report recommends a new project be included in the LECA for 2026 for the inspection of LP heaters using non-destructive testing and to plug the tube leaks with a cost estimate of $300K based on the actual cost for Unit 1 and Unit 2 HP heaters inspection carried out in 2024.

4.3.13 Deaerator

In the 2022 LECA, an allowance of $300K was included for an internal inspection and NDE of the heater shell, feedwater piping and nozzles, and steam piping to the deaerator and to perform any necessary overhaul of the deaerator components and its associated steam system in the year 2028.

This report recommends keeping this project as per 2022 LECA.

4.3.14 Pumps

The 2022 LECA report recommended the following overhaul frequency for major pumps.

- Feedwater Pumps – every 6 years.
- Condensate extraction pumps (CEP), circulating water pumps (CWP), and vacuum pumps (VP) – every 12 years.

A review of the failure history of CEP, CWP, and VP indicates that failures are occurring within the 12-year maintenance cycle. It is therefore recommended to reduce the overhaul interval for these pumps to <12 years.

The carryover reports from 2021 to 2023 have shown failure of pump motors therefore, it is recommended to include the pump motor in the overhaul plan to reduce in-service failures of pump motors.

4.3.14.1 *Boiler Feedwater Pumps*

The BFPE was previously overhauled in 2021, and its next overhaul will be scheduled in 2027 and 2033.

Unit 3 west side feedwater pump (BFPW) was previously overhauled in 2021, and its next overhaul is scheduled for 2025 and 2031.

In the 2022 LECA, an annual allowance of $700K was included for this work. This report recommends the allowance be increased to $750K for each pump overhaul to include motor rewind.

4.3.14.2 *Cooling Water Pumps*

The east-side cooling water pump (CWPE) was previously overhauled in 2022, and its next scheduled overhaul will be in rescheduled for 2031.

The west-side cooling water pump (CWPW) was previously overhauled in 2017, and its next scheduled overhaul will be in 2026.

In the 2022 LECA, an allowance of $400K was included for this work. This report recommends the allowance be increased to $430K for each pump overhaul to include motor rewind.

4.3.14.3 *Condensate Extraction Pumps*

The north-side condensate extraction pump (CEPN) was previously overhauled in 2017, and its next scheduled overhaul will be in 2026.

The south-side condensate extraction pump (CEPS) was previously overhauled in 2015, and its next scheduled overhaul will be in 2027 which is one year more than recommended 9 years overhaul frequency.

In the 2022 LECA, an allowance of $300K was included for this work. This report recommends the allowance be increased to $320K for each pump overhaul to include motor rewind.

4.3.14.4 *Vacuum Pumps*

In 2022, the north side pump (VPN) was moved to the south side and a new pump was installed at the north side. The south side vacuum pump (VPS) is being replaced in 2025.

Major overhauls of the south and north side vacuum pump are recommended for 2034 and 2031, respectively.

In the 2022 LECA, an allowance of $200K was included for this work. This report recommends the allowance be increased to $220K for each pump overhaul to include motor rewind.

4.3.15 Generator Vibration Monitoring Equipment

The generator does not have any instrumentation for general condition monitoring. Given that this equipment will operate beyond 2035 as a synchronous condenser it is recommended to install the instrumentation that can help to predict the condition of the equipment.

2022 LECA included a capital project for the addition of generator condition monitoring equipment with an allowance of $337K in the year 2025. This report recommends keeping this project as per 2022 LECA.

4.3.16 Capital Plan Matrix

Table 4-3: Capital Plan Matrix (Unit 3)*

	Description	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Boiler Condition Assessment	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R
2	Unforeseen Failures & Latent Issues	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R
3	Flame Scanners	R										
4	Boiler Reheater		R									
5	Condensate and Feedwater Valves				O							
6	Condenser		I/O									
8	Turbine	O									O	
8	Turbine Valves	O			O			O			O	
9	Turbine Governor Spares		S									
10	Generator			O						O		
11.1	HP Heater 4		I/O									
11.2	HP Heater 6	I/O										
12	LP Heaters		I									
13	Deaerator				I/O							
14	Major Pump Overhaul											
14.1.1	BFPE			O						O		
14.1.2	BFPW	O						O				
14.2.1	CWPE							O				
14.2.2	CWPW		O									
14.3.1	CEPN		O									
14.3.2	CEPS			O								

	Description	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
13.4.1	VPN							O				
13.4.2	VPS										O	
14	Generator Vibration Monitoring Equipment	R										

*O: Overhaul; R: Replacement or New addition; I: Inspection, S: Spares

4.4 Synchronous Condenser

4.4.1 Powerhouse Building

The synchronous condenser located in the powerhouse building will remain in use after the facility is closed for power generation. The 2022 LECA recommended visual inspections of the exterior building envelope and roof to define the scope of work and an allowance of $900K in the year 2028 to complete the work. This report recommends keeping this project.

4.4.2 Exciter/Transformer

The synchronous condenser exciter and transformer are aged and require upgrades to ensure reliable operation. The 2022 LECA recommended an inspection to define the scope of work. The inspection will include a check on performance, age, reliability and maintenance indicators in accordance with EPRI Guidelines TR112350 Volume 3 – Hydro Life Extension Modernization Guide Volume 3 for Electromechanical equipment.

This report recommends keeping this project with an allowance to implement recommendations from the inspection of $2.0M in the year 2030 to complete the work.

4.4.3 Miscellaneous Components

Several peripheral systems such as the cooling water system, H2 system, generator lube oil system, and seal oil system of unit 3 generator are aged and require refurbishment to maintain reliable operation of unit 3 generator as a synchronous condenser. This refurbishment work includes replacement of pumps or motors as required, change of seals and bushings. The 2022 LECA recommended an inspection to define the scope of work and an allowance of $1.5M in the year 2027 to complete the work. This report recommends keeping this project.

4.5 Common Facilities

4.5.1 Unforeseen Failures and Latent Issues

Common systems include all auxiliaries, water treatment plant, wastewater treatment plant, pump houses, marine terminal, electrical infrastructure, fuel handling and storage system, and fire protection. The equipment is mainly original to the plant and unforeseen failures are

likely to happen due to the age of the equipment. To account for such unforeseen failures, an annual allowance of $1M was recommended in the 2022 LECA.

Reviewing the actual costs from 2021 to 2023, this report recommends maintaining the same allowance.

4.5.2 Marine Terminal

A condition assessment is conducted every 5 years and includes:

- Diving inspection of jetty pilings and includes UT readings to monitor corrosion at established zones.
- Detailed assessment of the concrete gravity fenders suspension system (this includes the fender pins). Data is collected to determine the amount of "slotting" that has occurred since the previous inspection and the rate of wear is used to determine planned replacement of the suspension arms (pins) before sudden failure.

The last condition assessment was carried out in 2021; therefore, the next recommended condition assessment will be in 2026 and then in 2031.

This report recommends the 2026 condition assessment and overhaul allowance be $1M and a new project planned for 2031.

4.5.3 Marine Terminal Loading Arms

The loading arms at marine terminal are overhauled on a three-year interval. The 2021 overhaul reported cost was $685K.

This report recommends the 2027 overhaul allowance be $820K and a new project planned for 2030 and 2033.

4.5.4 Fuel Piping

The fuel piping is original, and the condition is unknown therefore it is recommended that a condition assessment be completed as a failure in this piping could result in an environmental incident.

This report recommends a new project in 2026 to be included in the LECA for an inspection and overhaul of fuel piping with an allowance of $1M.

4.5.5 Fuel Tank

Fuel tanks are required to have an internal inspection every 10 years as per API 653. This duration can be extended based on the corrosion rate established during the last inspection. Note that Tank 3 inspection was extended with government approval to 2031.

The status of the fuel tanks inspections is summarized in the Table 4-4.

Table 4-4: Summary of Fuel Tank Inspections

Fuel Tank	Last Out of service Inspection/Refurbishment	Next Inspection
Tank 1	2022	2032
Tank 2	2008	N/A (tank retired)
Tank 3	2012	2031
Tank 4	2024	2034
Day Tank	2023	2033

The inspection requires the tank to be isolated and emptied and scaffolding installed.

The scope of the last refurbishment included the following:

- TK1 - included roof reinforcement, floor replacement and patches to the walls around the circumference of the wall up to approximately 1.5 m from the floor. It is expected that the cost of the next inspection will be significantly less.
- TK3 - included refurbishment of the floor and walls.
- TK4- included roof reinforcement, floor replacement and patches to the walls around the circumference of the wall up to approximately 1.5 m from the floor. The cost of the this work in 2024 was approximately $6.5M. It is expected that the cost of the next inspection will be significantly less.
- The cost of the most recent inspection and refurbishment for the day tank in 2023 was $943K.

This report recommends a new project included in the LECA for the inspection and an allowance for refurbishment work for the floor and the walls of Tank 1 and Tank 4 of $3M for each tank at their next scheduled inspection.

This report recommends a new project included in the LECA for the inspection and an allowance for refurbishment work for the floor and the walls of Tank 3 of $6.5M.

This report also recommends a new project included in the LECA for the inspection and refurbishment work for the floor and the walls of the Day Tank with a cost of $500K in the year 2033.

4.5.6 Light Oil System

The light oil is used during startup of the plant and is also used for backup generators. The condition of the light oil storage tanks and piping system is not known as a condition assessment has not been carried out for light oil system.

This report recommends a new project in 2027 to be included in the LECA for the inspection and refurbishment of the light oil system with an allowance of $500K.

4.5.7 Stage 1 and 2 Pump House

A structural assessment of the pump house floor area was completed in 2022. The assessment report found that the beam has no capacity for dead or live load. The assessment report recommended that the pump house beams and slabs be refurbished, or new beams be installed directly beneath the existing beams to re-establish the original capacity. The report also recommends that certain areas be limited to foot traffic only as necessary until such refurbishments can be implemented.

Considering the recommendations of the 2022 assessment, this report recommends a new project included in the LECA for the refurbishment work of the pump house in the year 2025 with a cost of $4M based on the estimate provided in the 2022 assessment report.

4.5.8 Water Treatment & Wastewater Treatment

A condition assessment of the water treatment and wastewater treatment plant is currently in progress. Preliminary findings indicate that there are deficiencies in this equipment such as holes in the Clearwell tank, pitting in the tank floor and piping, ventilation system issue, anodes of water treatment system are eroded, and corrosion in sand filters bottom.

The magnitude of the work will be better quantified when the report is issued. At this stage, this report recommends a new project be included in the LECA for 2026 for the refurbishment work of the water treatment and wastewater treatment plant equipment with an allowance of $2M.

4.5.9 Additional Air-Cooled Compressor

The existing air compressors are cooled by the condenser circulating water system. In summer, the circulating water becomes unavailable as the boilers are not operating and the compressors are then cooled with raw water. Operating with raw water is causing issues with the compressor bearings resulting in increased maintenance to keep the compressors operating. To avoid running the main air compressors during summer, it is recommended to install an additional air-cooled compressor to meet the compressed air requirements during shutdown.

This report recommends a new project in 2026 to be included in the LECA for the addition of a small, air-cooled compressor with a cost of $100K.

4.5.10 Plant Heating System

The station has a current Project to replace the existing steam heating system with electric heaters including upgrades to the electric HVAC system complete with new controls/thermostats, air supply diffusers and ducting.

This report includes the current Project scheduled in 2026 and 2027 with a cost of $12M based on a NLH estimate.

4.5.11 Black Start and Emergency Power Diesel Gensets

Black start and plant emergency power is provided by 6 containerized Caterpillar (CAT) 3516B (mobile package XQ 2000 type) The units were initially leased by HTGS in 2015 and later purchased and fitted with permanent stacks in 2018 to reduce the impingement of exhaust on the surrounding facilities.

Cables connecting the black start diesel generators to their step-up transformers and other services are run on the ground and sitting on the gravel under the genset enclosure, which is more typical of a temporary installation. These cables have suffered damage, and it is recommended that these cables be buried in conduit from a safety perspective.

This report recommends a new project in 2025 to be included in the LECA for on ground cable to be replaced with cables buried in cable trenches using cable conduits with an allowance of $500K in the year 2025.

4.5.12 Buildings

Based on Contractor recommendations from roof inspections, several roofs are due for replacement. Most of this work has been postponed over the years considering the facility decommissioning timeline.

This report recommends a new project in 2026 to be included in the LECA for the roof replacement and drainage upgrade of water treatment building, No. 2 pump house building, and mechanics workshop building with an allowance of $1.5M based on the roof refurbishment work carried out in 2021 at site.

4.5.13 Electrical Equipment

Most of the electrical installation is of original vintage and is operating beyond its anticipated design life. Electrical codes have changed, and spares are not available in the market. In case of failure, the lead time of the new equipment would be more than 12 months.

It is therefore, recommended to carry out a risk assessment study for long lead electrical equipment considering factors such as current condition of the equipment, lead time in case of failure, impact of the failure to power generation, and the cost of the spares. This study can help NLH decide if some of this electrical equipment is to be replaced proactively before failure to minimize the risk of not being able to supply power when required.

4.5.14 DCS Hardware

The facility is following a road map provided by DCS OEM, Schneider, to replace the DCS hardware that is near to obsolete.

Schneider has provided a road map to HTGS to keep updating the existing hardware to avoid obsolescence. This road map provides guidelines to upgrade the existing workstation of H-92 to the new model D96 and server upgrades from H90/V91 to H94/V95. These upgrades will enable HTGS facility with up-to-date cyber security solutions, alarm management in the control room by operators, remote support, and monitoring services. This project was initiated in 2021 and is ongoing.

To complete the DCS upgrade program, this report recommends a new project in 2026 and 2027 to be included in the LECA for the DCS upgrades with an allowance of $400K per year based on price provided by OEM.

4.5.15 CEMS Upgrades

Continuous emission monitoring system (CEMS) are installed to monitor and report emissions from the facility. CEMS are required at the facility to comply with certification of approval (CoA) requirements to measure emissions from each boiler. CEMS has shown some failures in the past such as lost signal in human machine interface (HMI). The old workstation, Cryus EIS, was no longer supported by the manufacturer. Therefore, the workstation was replaced.

This report recommends a new project in 2028 to be included in the LECA for the CEMS instrumentation upgrade with an allowance of $300K based on previous work performed at the station.

4.5.16 Quarry Brook Dam

Quarry Brook Dam provides raw water to the plant for boiler water, domestic water and firewater. Most of the civil assets are approximately 30-55 years old. The dam is inspected on an annual basis as part of Hydro's Dam Inspection program. The last inspection was carried out in July 2024. According to the inspection report, the following areas of the structure need refurbishment.

Significant leakage was observed along both the left and right sides of the fishway. The leaks in the fishway could lead to premature deterioration of the wooden structure. Assessment required to identify options for sealing the structure.

Rotting and rotation of the trapezoidal piece just upstream of the fishway opening was also observed during the inspection. The level of damage was difficult to assess looking down from the top of the grating. The grating should be removed to assess the damage and make any required refurbishments.

Some minor leakage was found on a few places in spill way channels where timber was misaligned and rotated. These timbers require replacement.

To address the above refurbishment work, this report recommends a new project in 2027 to be included in the LECA with an allowance of $400K based on previous work performed at the station.

Hatch has included a capital project to carry out the refurbishment as recommended in these reports.

4.5.17 Common Facilities Capital Plan Matrix

Table 4-5: Common Facilities Capital Plan Matrix*

	Description	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	In Service Failures	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	I/R	
2	Marine Terminal		I					I				
3	Marine Terminal Loading Arms			O			O			O		
4	Fuel Piping		I									
5	Fuel Tanks											
5.1	Tank 1								I/R			
5.2	Tank 3							I/R				
5.3	Tank 4										I/R	
5.4	Day Tank									I/R		
6	Light Oil System			I/R								
7	Stage 1 & 2 Pump House	R										
8	Water treatment and wastewater treatment		R									
9	Additional ACC		R									
10	Plant Heating System		R	R								
11	Black Start and Emergency Power Diesel Gensets	O										
12	Buildings		R									
13	Electrical Equipment		I									
14	WTP VFDs		I/R									
15	DCS Hardware		R	R								
16	CEMS				R							
17	Quarry Brook Dam			O								

*O: Overhaul; R: Replacement or New addition; I: Inspection.

5. Operating Cost Update

The O&M cost was updated based on the following:

- Staffing at current conditions.

Table 5-1: O&M Plan ($1000s)

	2025
Salaries and Benefits	**16,208**
Materials	2,449
Contract Labour	4,680
Tools	82
Chemicals	472
SEM (Supplies, Equipment, Materials) Total	**7,682**
Office Supplies & Expenses Total	**414**
Professional Services Total	**507**
Equipment Rentals Total	**175**
Travel Total	**29**
Misc. Expenses Total	**108**
Building Rental and Maintenance Total	**249**
Transportation Total	**23**
Group Insurance	**443**
Total O&M Cost	**25,837**

End of Technical Content

Appendix A:
List of Documents Received from NLH

No.	File Name	Document Title	Type
1	23-114-05- Pumphouse 1 - DRAFT.pdf	23-114-05 Pumphouse 1 Sump Inspections	Report
2	100D Pipe (Revision L).pdf	Captial Precast 100D Reinforced Circular Concrete Pipe	DWG
3	238-07-0130-006-footing arrangment.pdf	Power House - General Arrangement of Footings	DWG
4	238-08-0210-001-plant floor drains.pdf	Foundation Drainage Plan at Elev. 11'-2"	DWG
5	238-08-0219-SK003.pdf	Details of Grease and Oil Trap, North of Powerhouse	DWG
6	238-12-0008-002.pdf	Wastewater treatment Facility Flow Diagram	DWG
7	238-12-0008-049.pdf	Wastewater Treatment System G. A. at North of Powerhouse and Site Plot Plan	DWG
8	238-12-0008-053.pdf	Wastewater treatment System Underground Piping Elevations Sheet 1	DWG
9	238-12-0008-054.pdf	Wastewater treatment System Underground Piping Elevations Sheet 2	DWG
10	238-12-0008-055.pdf	Wastewater treatment System Underground Piping Elevations Sheet 3	DWG
11	238-12-0008-056.pdf	Wastewater treatment System Underground Piping Elevations Sheet 4	DWG
12	238-12-0008-057.pdf	Wastewater treatment System Underground Piping Elevations Sheet 5	DWG
13	238-12-0008-058.pdf	Wastewater treatment System Manole Details	DWG
14	238-12-0008-063.pdf	Wastewater treatment System Oil Separators 1 & 2 Location and Installation	DWG
15	238-12-0008-072.pdf	Liquid Waste System: Waste Oil Water Separator Installation & Sump Pump Piping Mods	DWG
16	238-12-0008-073.pdf	Liquid Waste System: Misc. Details for Waste Oil Water Separator Instalation & Sump Pump Piping Mods	DWG
17	238-12-0008-083.pdf	Cathodic Protection of Underground Separator Tanks	DWG
18	730-DMX-Internal Expanding Band 5-C.pdf	Standard Reline internal Expanding Band 5-C	DWG
19	1403-140-C-198.pdf	Holyrood Generating Station - Stage II Powerhouse Yard Services	DWG
20	1403-140-C198-R7.pdf	Holyrood Generating Station - Stage II Powerhouse Yard Services	DWG
21	2018 Stack Liner UT readings comparison.xlsx	2018 Stack Liner UT readings comparison	Excel
22	2021 Boiler Stack Inspection and Concrete Overhaul Reports-Crosbie World.pdf	Holyrood Thermal Generating Station: Boiler Stack Inspection and Concrete Repairs	Doc
23	2022 TISF Tracker.xlsx	2022 TISF TRacker	Excel
24	2023 Marine Terminal Shoreline Boardwalk Inspection-Final.pdf	2023 Marine Terminal Shoreline Boardwalk Inspection-Final	Doc
25	2023 TISF Tracker.xlsx	2023 TISF Tracker	Excel
26	2024 TISF Tracker.xlsx	2024 TISF Tracker	Excel
27	2415-18 Report Stack #1 (Low Res).pdf	Holyrood Thermal Generating Station Stack #1 Report	Report
28	2415-18 Report Stack #2 (Low Res).pdf	Holyrood Thermal Generating Station Stack #2 Report	Report
29	2415-18 Report Stack #3 (Low Res).pdf	Holyrood Thermal Generating Station Stack #3 Report	Report
30	258543-0000-BA10-RPT-0001 (1).pdf	Holyrood Marine Terminal 10 Year Life Extension	Doc
31	362320-S-1-RevA.pdf	Uint 3 - Discharge Pipe Repair Profiles, Sections and Notes	DWG
32	980485_2024-08-08_Holyrood_Newfoundland Labrador Hydro_10380257_TG1_Endwinding_Bump_Test.pdf	Newfoundland & Labrador Hydro Holrood - End Winding Vibration test Report	Report
33	AMS-2022-40 - Holyrood Boiler Stack Concrete Repair - Inspection Report - Stack 1.pdf	Boiler Stack Inspection and Concrete Repairs Stack 1	Report
34	AMS-2022-40 - NL Hydro - Holyrood Boiler Stacks Concrete Repair - Inspection Report - Stack 2.pdf	Boiler Stack Inspection and Concrete Repairs Stack 2	Report
35	AMS-2022-40 - NL Hydro - Holyrood Boiler Stacks Concrete Repair - Inspection Report - Stack 3.pdf	Boiler Stack Inspection and Concrete Repairs Stack 3	Report
36	Armature Winding Resistance_d3162041-_Completed.pdf	Armature Winding Resistance	Doc
37	B&W Memo - HTGS HP Heaters w attachments.pdf	B&W Memo - HTGS HP Heaters w attachments	Memo
38	Chemical Tanks Inspection Summary Report.pdf	Chemical Tanks Inspection Summary Report	Report
39	Clarifier Recommendations.pdf	Clarifier Reccomendations	Memo
40	Clear Well Findings-Recommendations.pdf	Clear Well Findings-Recommendations	Memo
41	Clip from Capital Proposal-For information purposes on current condition.docm	Clip from Capital Proposal-For information purposes on current condition	Report
42	Complete_with_Docusign_24-114-06_-_Jetty_Ins.pdf	24-114-06 - Marine terminal Gravity Fender Inspection	Report
43	d316303_Field Measurements_Completed.pdf	Field Measurements	Report
44	DFB-REG-211775-MRB.pdf	Manufacturing Record Book	Report
45	DMX Reline Installation Guide.pdf	DuroMaxx Steel Reinforced PE Liner Pipe Unloading, Handling & installation Guide	Form
46	Final Photo and Condition Report - Pump house Roofs.pdf	Final Photo and Condition Report - Pump house Roofs	Report
47	Final Photo Report 2022 Outbuildings Mechanic Shop Welding Shop and Watertreatment Plant.pdf	Final Photo Report 2022 Outbuildings Mechanic Shop Welding Shop and Watertreatment Plant	Report
48	Hatch HRD Civil Condition Assessment - Final Report.pdf	Hatch HRD Civil Condition Assessment - Final Report	Report
49	Holyrood GS Unit #1 HP Feedwater Heaters ER-20230531-1393 - email.pdf	Holyrood GS Unit #1 HP Feedwater Heaters ER-20230531-1393 - email.pdf	Memo
50	Holyrood Stack #1 and #2 Close Out Binder - 2023.pdf	Holyrood Protective treatment Completions Dossier Stacks 1 & 2	Report
51	J159405-001-Rev.R1 - T252 Internal Profilometry.pdf	J159405-001-Rev.R1 - T252 Internal Profilometry	Report
52	JBC-24-C-010-HTGS Ladder Inspections-Final 2024.06.26.pdf	JBC-24-C-010-HTGS Ladder Inspections-Final	Report
53	NACE Inspection Results.pdf	NACE Inspection Results	Memo
54	Photo Report - NL Hydro - Roof Hatch (2 Thermal Plant Rd., Holyrood, NL) Job# 028-457068-311 (2022-12-05 17_48_55 UTC) (2).pdf	Photo Report - NL Hydro - Roof Hatch (2 Thermal Plant Rd., Holyrood, NL)	Report
55	Photo Report - NL Hydro - Roof Inspections (2 Thermal Plant Rd., Holyrood, NL) Job# 028-460703-310 (2023-01-09 18_47_22 UTC).pdf	Photo Report - NL Hydro - Roof Inspections (2 Thermal Plant Rd., Holyrood, NL)	Report
56	Photo Report - NL Hydro - Roof Level 5 (2 Thermal Plant Rd., Holyrood, NL) Job# 028-457069-311 (2).pdf	Photo Report - NL Hydro - Roof Level 5 (2 Thermal Plant Rd., Holyrood, NL)	Report
57	Photo Report - NL Hydro - Roof Level 7 (2 Thermal Plant Rd., Holyrood, NL) Job# 028-457067-311 (2).pdf	Photo Report - NL Hydro - Roof Level 7 (2 Thermal Plant Rd., Holyrood, NL)	Report
58	Photo Report - NL Hydro - Roof Level 11 (2 Thermal Plant Rd., Holyrood, NL) Job# 028-456611-311 (2023-01-09 13_22_37 UTC).pdf	Photo Report - NL Hydro - Roof Level 11 (2 Thermal Plant Rd., Holyrood, NL)	Report
59	Retaining Ring Inspection Report.pdf	Ultrasonic and Eddy Current Inspection of Holyrood Unit 1 Generator Retaining Rings July 2024	Report
60	Sand Filter 1 and 2 laser scan details.pdf	Sand Filter 1 and 2 laser scan details	Report
61	Sand Filter 3-2.xls	Sand Filter 3-2.xls	Excel
62	Seal Pit Headwall - Sketch R1.pdf	Seal Pit Headwall - Sketch R1	DWG
63	SF1 East.xls	SF1 East	Excel
64	SF1 North.xls	SF1 North	Excel

65	SF1 South.xls	SF1 South	Excel
66	SF1 West.xls	SF1 West	Excel
67	SF2.xls	SF2	Excel
68	SF3.xls	SF3	Excel
69	SF3-Corrosion Closeup-1.png	SF3-Corrosion Closeup-1	Photo
70	SF3-ISO.png	SF3-ISO	Photo
71	SF3-Manway.png	SF3-Manway	Photo
72	SF3-Nozzle.png	SF3-Nozzle	Photo
73	stage 2 floor drains.pdf	Powerhouse Ground Floor Drainage Plan & Details	DWG
74	UAV Inspection Report - 22-114-04 - Pumphouse 2.pdf	22-114-04 Pumphouse 2 Sump Inspections	Report
75	Unit 1 #4 HP Heater ET Det Data.XLS	Unit 1 #4 HP Heater ET Det Data	Ecel
76	Unit 1 #4 HP Heater ET Report (2024-06-25) - Acuren Group Inc.pdf	Unit 1 #4 HP Heater ET Report (2024-06-25) - Acuren Group Inc	Report
77	Unit 1 HP Heater #5 (2024-09-18) ET Report - Acuren Group Inc.pdf	Unit 1 HP Heater #5 (2024-09-18) ET Report - Acuren Group Inc	Report
78	Unit 1 HP Heater #5 ET Det Data.XLS	Unit 1 HP Heater #5 ET Det Data	Excel
79	Unit 3 #5 HP Heater ET Det Data.XLS	Unit 3 #5 HP Heater ET Det Data	Excel
80	Unit 3 #5 HP Heater ET Report (2024-06-27) - Acuren Group Inc.pdf	Unit 3 #5 HP Heater ET Report (2024-06-27) - Acuren Group Inc	Report
81	WTP Condition Assessment-2010 Draft only.pdf	Water treatment Plant Condition Assessment	Report
82	WWEB Upgrades As-Build Drawings.pdf	WWEB Upgrades As-Built Drawings	DWG
83	wwtp condition assessment 2010.pdf	Waste Water Treatment Plant Condition Assessment 2010	Report
84	,Stage1drainage system.pdf	Foundation Drainage Plan at Elev. 11'-2"	DWG
85	1. North Caustic Soda Tank Baysteel OOS API 653 Inspection Report.pdf	North Caustic Soda Tank Out-Of-Service Inspection	Doc
86	2. South Caustic Soda Tank Baysteel OOS API 653 Inspection Report.pdf	South Caustic Soda Tank Out-Of-Service Inspection	Doc
87	3. WWTP Caustic Soda Tank Baysteel OOS API 653 Inspection Report.pdf	Caustic Soda Tank Waste Water Treatment Plant Out-of-Service Inspection	Doc
88	4. Caustic Soda Mixing Tank Baysteel OOS API 653 Inspection Report.pdf	Caustic Soda Mixing Tank Out-of-Service Inspection	Doc
89	5. Horizontal Caustic Soda Storage Tank Inspection Report.pdf	Caustic Soda Horizontal Storage Tank Out-OF-Service Inspection Report	Doc
90	6. North Bulk Acid Storage Tank Baysteel OOS API 653 Inspection Report.pdf	North Bulk Acid Storage Tank Out-Of-Service Inspection	Doc
91	7. South Bulk Acid Storage Tank Baysteel OOS API 653 Inspection Report.pdf	South Bulk Acid Storage Tank Out-Of-Service Inspection	Doc
92	8. Acid Tank Piping UT-190821MB-001 RD.pdf	Acid Tank Piping UT	Report
93	21-114-007_-_Pumphouse_2_inspection_report.pdf	Pumphouse 2 Sump Inspections	Report
94	23-114-05 - Pumphouse 2 - DRAFT.pdf	22-114-04 Pumphouse 2 Sump Inspections	Report

Appendix B: Capital Plan

	Unit 1 - Capital Plan (1000 CAD)												
Year	**Project**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**Total**
Annual Capital Project Allowance	Boiler Condition Assessment	1,300	1,339	1,379	1,421	1,463	1,507	1,552	1,599	1,647	1,696	1,747	**16,650**
	Unforeseen Failures & Latent Issues	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	1,305	1,344	**12,808**
2025	Flame Scanners Replacement	300											**300**
	HP heater No. 6 inspection & overhaul	300											**300**
2026	Lower slope Waterwalls Replacement		5,150										**5,150**
	Boiler Stop Valve Replacement		515										**515**
	LP Heaters Inspections		309										**309**
	HP heater No. 4 Replacement		1,030										**1,030**
	Condenser Inspection and Overhaul		515										**515**
	Overhaul west-side boiler feedwater pump (BFPW)		773										**773**
	Overhaul east-side cooling water pump (CWPE)		443										**443**
	Overhaul south-side condensate extraction pump (CEPS)		330										**330**
2027	Overhaul east-side boiler feed water pump (BFPE)			796									**796**
	Overhaul north-side condensate extraction pump (CEPN)			339									**339**
	Dearator Inspection & Overhaul			318									**318**
	Overhaul Turbine Valves			3,183									**3,183**
	Overhaul of Condensate and Feedwater Valves			1,061									**1,061**
2028	No Projects												**0**
2029	No Projects												**0**
2030	Overhaul Turbine Valves						3,478						**3,478**
	Overhaul Unit 1 Generator						1,159						**1,159**
2031	Overhaul west-side cooling water pump (CWPW)							513					**513**
	Overhaul north side vacuum pump (VPN)							263					**263**
2032	Overhaul west-side boiler feed water pump (BFPW)								922				**922**
2033	Overhaul east-side boiler feed water pump (BFPE)									950			**950**
	Overhaul Turbine Valves									3,800			**3,800**
	Overhaul Turbine									13,934			**13,934**
	Overhaul south side vacuum pump (VPS)									279			**279**
2034	No Projects												**0**
2035	No Projects												**0**
	Total Capital Upgrades Cost	**2,900**	**11,433**	**8,137**	**2,513**	**2,589**	**7,303**	**3,522**	**3,751**	**21,877**	**3,001**	**3,091**	**70,118**

	Unit 2 - Capital Plan (1000 CAD)												
Year	Project	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Annual Capital Project Allowance	Boiler Condition Assessment	1,300	1,339	1,379	1,421	1,463	1,507	1,552	1,599	1,647	1,696	1,747	**16,650**
	Unforeseen Failures and Latent Issues	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	1,305	1,344	**12,808**
2025	No Projects												**0**
2026	Lower slope Waterwall Replacement		5,150										**5,150**
	Overhaul Turbine Valves		3,090										**3,090**
	Overhaul Unit 2 Generator		1,030										**1,030**
	Condenser Inspection and Overhaul		515										**515**
	Dearator Inspection & Overhaul		309										**309**
	LP Heaters Inspection		309										**309**
	HP Heater No. 4, 5, and 6 Inspection		618										**618**
	Boiler Stop Valve overhaul		412										**412**
	Overhaul east-side cooling water pump (CWPE)		443										**443**
	Overhaul south-side condensate extraction pump (CEPS)		330										**330**
	Overhaul of Condensate and Feedwater Valves		1,030										**1,030**
2027	Overhaul south side vacuum pump (VPS)			233									**233**
	Overhaul north-side condensate extraction pump (CEPN)			339									**339**
2028	No Projects												**0**
2029	Overhaul west-side boiler feedwater pump (BFPW)					844							**844**
	Overhaul Turbine Valves					3,377							**3,377**
2030	Overhaul east-side boiler feedwater pump (BFPE)						869						**869**
2031	No Projects												**0**
2032	Overhaul Unit 2 Generator								1,230				**1,230**
	Overhaul Turbine								13,529				**13,529**
	Overhaul west-side cooling water pump (CWPW)								529				**529**
	Overhaul Turbine Valves								3,690				**3,690**
2033	Overhaul north side vacuum pump (VPN)									279			**279**
2034	No Projects												**0**
2035	No Projects												**0**
	Total Capital Upgrades Cost	**2,300**	**15,605**	**3,013**	**2,513**	**6,809**	**3,536**	**2,746**	**21,806**	**3,192**	**3,001**	**3,091**	**67,612**

	Unit 3 - Capital Plan (1000 CAD)												
Year	Project	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Annual Capital Project Allowance	Boiler Condition Assessment	1,300	1,339	1,379	1,421	1,463	1,507	1,552	1,599	1,647	1,696	1,747	**16,650**
	Unforeseen failures and latent issues	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	1,305	1,344	**12,808**
	Overhaul Turbine Valves	3,000											**3,000**
	Generator Condition Monitoring Equipment	337											**337**
	HP Heater No. 6 Inspection	300											**300**
	Flame Scanners Replacement	300											**300**
	Overhaul west side feedwater pump (BFPW)	750											**750**
	Overhaul Turbine	16,000											**16,000**
2026	Boiler Reheater Replacement		5,150										**5,150**
	Overhaul west-side cooling water pump (CWPW)		443										**443**
	Overhaul north-side condensate extraction pump (CEPN)		330										**330**
	Condenser Inspections and Overhaul		515										**515**
	Turbine Governor Spares		2,060										**2,060**
	HP Heater No.4 Inspection		309										**309**
	LP Heaters Inspections		309										**309**
2027	Overhaul east side boiler feedwater pump (BFPE)			796									**796**
	Overhaul south-side condensate extraction pump (CEPS)			339									**339**
	Overhaul Unit 3 Generator			1,061									**1,061**
2028	Overhaul Turbine Valves				3,278								**3,278**
	Dearator Inspection & Overhaul				328								**328**
	Overhaul of Condensate and Feedwater Valves				1,093								**1,093**
2029	No Projects												**0**
2030	No Projects												**0**
2031	Overhaul north side vacuum pump (VPN)							263					**263**
	Overhaul east-side cooling water pump (CWPE)							513					**513**
	Overhaul west side feedwater pump (BFPW)							896					**896**
	Overhaul Turbine Valves							3,582					**3,582**
2032	No Projects												**0**

	Unit 3 - Capital Plan (1000 CAD)												
Year	Project	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
2033	Overhaul east side boiler feedwater pump (BFPE)									950			**950**
	Overhaul Unit 3 Generator									1,267			**1,267**
2034	Overhaul Unit 3 Turbine										14,353		**14,353**
	Overhaul south side vacuum pump (VPS)										287		**287**
	Overhaul Turbine Valves										3,914		**3,914**
2035	No Projects												**0**
	Total Capital Upgrades Cost	**22,987**	**11,485**	**4,636**	**7,212**	**2,589**	**2,666**	**8,000**	**2,829**	**5,130**	**21,555**	**3,091**	**92,180**

	Synchronous Condenser - Capital Plan (1000 CAD)												
Year	Project	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
2027	Miscellaneous Components			1,591									**1,591**
2028	Powerhouse Building				983								**983**
2030	Exciter/Transformer						2,319						**2,319**
	Total Capital Upgrades Cost	**0**	**0**	**1,591**	**983**	**0**	**2,319**	**0**	**0**	**0**	**0**	**0**	**4,893**

	Common Facilities - Capital Plan (1000 CAD)												
Year	Project	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Annual Capital Project Allowance	In Service Failures	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	1,305	1,344	**12,808**
2025	Stage 1 & 2 Pump House Refurbishment	4,000											**4,000**
	Black Start and Emergency Power Diesel Gensets (Cable work)	500											**500**
2026	Marine Terminal Condition Assessment		1,030										**1,030**
	Repair water treatment and wastewater treatment equipment		2,060										**2,060**
	Plant Heating System Upgrades		6,180										**6,180**
	Buildings Refurbishment Work		1,545										**1,545**
	Upgrade DCS Controllers / Hardware		412										**412**
	Additional Air Cooled Compressor		103										**103**
	Level 2 Condition Assessment and repair of Fuel Piping		1,030										**1,030**
2027	Plant Heating System Upgrades			6,365									**6,365**
	Upgrade DCS Controllers / Hardware			424									**424**
	Overhaul Quarry Brook Dam			424									**424**
	Overhaul Marine Terminal Loading Arms			870									**870**
	Perform Level 2 Condition Assessment of Light Oil System			530									**530**
2028	CEMS Upgrade				328								**328**
2029	No Projects												**0**
2030	Overhaul Marine Terminal Loading Arms						951						**951**
2031	Fuel Tank 3 Out of Service Inspection							7,994					**7,994**
	Marine Terminal Condition Assessment							1,194					**1,194**
2032	Fuel Tank 1 Out of Service Inspection								3,690				**3,690**
2033	Day Tank Out of Service Inspection									633			**633**
	Overhaul Marine Terminal Loading Arms									1,039			**1,039**
2034	Fuel Tank 4 Out of Service Inspection										3,914		**3,914**
2035	No Projects												**0**
	Total Capital Upgrades Cost	**5,500**	**13,390**	**9,675**	**1,421**	**1,126**	**2,110**	**10,382**	**4,919**	**2,939**	**5,219**	**1,344**	**58,025**