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April 17, 2024

The 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: Monthly Energy Supply Report for the Island Interconnected System for March 2024

Enclosed please find Newfoundland and Labrador Hydro's Monthly Energy Supply Report for the Island Interconnected System as directed by the Board of Commissioners of Public Utilities.

Should you have any questions, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO

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Senior Legal Counsel, Regulatory
SAW/rr

Encl.

ecc:

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Monthly Energy Supply Report for the Island Interconnected System for March 2024

April 17, 2024

A report to the Board of Commissioners of Public Utilities



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1.0 Introduction

On February 8, 2016, the Board of Commissioners of Public Utilities (“Board”) requested Newfoundland and Labrador Hydro (“Hydro”) file a biweekly report containing, but not limited to, the following:

- 1) System Hydrology Report;
- 2) The thermal plant operated in support of hydrology;
- 3) Production by plant/unit; and
- 4) Details of any current or anticipated long-term derating.

In July 2016, the Board indicated that a monthly report would thereafter be sufficient. This report provides data for March 2024.¹

2.0 System Hydrology

Reservoir inflows in March 2024 were 139% above the month’s historical average.² Table 1 summarizes the aggregate storage position of Hydro’s reservoirs at the end of the reporting period.

Table 1: System Hydrology Storage Levels

Date	2024 (GWh)	2023 (GWh)	20-Year Average (GWh)	Minimum Storage Limit (GWh)	Maximum Operating Level (GWh)	Maximum Operating Level (%)
31-Mar-2024	1,979	1,483	1,403	338	2,452	81

The aggregate reservoir storage level on March 31, 2024 was 1,979 GWh, which is 19% below the seasonal maximum operating level and 486% above the minimum storage limit.³ Inflows to the reservoirs of the Bay d’Espoir System were 221% of average during March 2024, while inflows to the

¹ Effective April 2023, Hydro added Section 2.1 (Ponding), Section 2.2 (Spill Activity), and Appendix A (Ponding and Spill Transactions) within this report. “Newfoundland and Labrador Hydro – Streamlining of Quarterly Regulatory Report to Parties – Board’s Decision on Reporting,” Board of Commissioners of Public Utilities, May 11, 2023.

² Calculated in terms of energy (gigawatt hour [“GWh”]).

³ Minimum storage limits are developed annually to provide guidance in the reliable operation of Hydro’s major reservoirs—Victoria, Meelpaeg, Long Pond, Cat Arm, and Hinds Lake. The minimum storage limit is designed to indicate the minimum level of aggregate storage required such that if there was a repeat of Hydro’s critical dry sequence, or other less severe sequence, Hydro’s load can still be met through the use of the available hydraulic storage supplemented with maximized deliveries of power from the Muskrat Falls Hydroelectric Generating Facility over the Labrador-Island Link (“LIL”). Hydro’s long-term critical dry sequence is defined as January 1959 to March 1962 (39 months). Other dry periods are also considered during this analysis to ensure that no other shorter-term historic dry sequence could result in insufficient storage.

1 Hinds Lake Reservoir were 296% of average and inflows to the Cat Arm Reservoir were 381% of average.
2 Weather conditions across the Island reservoirs in March 2024 were mild with periods of rain and snow
3 melt, including significant rainfall events at the beginning and at the end of the month, resulting in the
4 above average inflows during the period.

5 From March 17, 2024 to March 21, 2024, the Paradise River Hydroelectric Generating Station was offline
6 due to a planned annual outage. The unit remained offline to troubleshoot a governor system issue
7 identified during startup; the issue was resolved the following day, and the unit released for service. The
8 Hinds Lake Hydroelectric Generating Station planned annual outage began on March 24, 2024 and
9 continued through the remainder of the month. On March 30, 2024, an unplanned outage occurred at
10 the Cat Arm Hydroelectric Generating Station due to transmission line icing. The unit was returned to
11 service the same day.

12 The second snow survey of 2024 was completed in mid-March 2024. The survey indicated that the snow
13 pack in the Bay d’Espoir watershed was below the historical average with snow-water equivalent
14 ranging between 30% and 62% of average. The least amount of snow-water equivalent was found at the
15 Burnt Pond Reservoir, while the highest amount of snow-water equivalent was found in the Upper
16 Salmon Reservoir. The Cat Arm and Hinds Lake watersheds were not surveyed due to inclement
17 weather; however, visual observation of the Hinds Lake watershed indicated the presence of snow
18 across the entire watershed.

19 Figure 1 plots the 2023 and 2024 storage levels, minimum storage limits, maximum operating level
20 storage, and 20-year average aggregate storage for comparison.

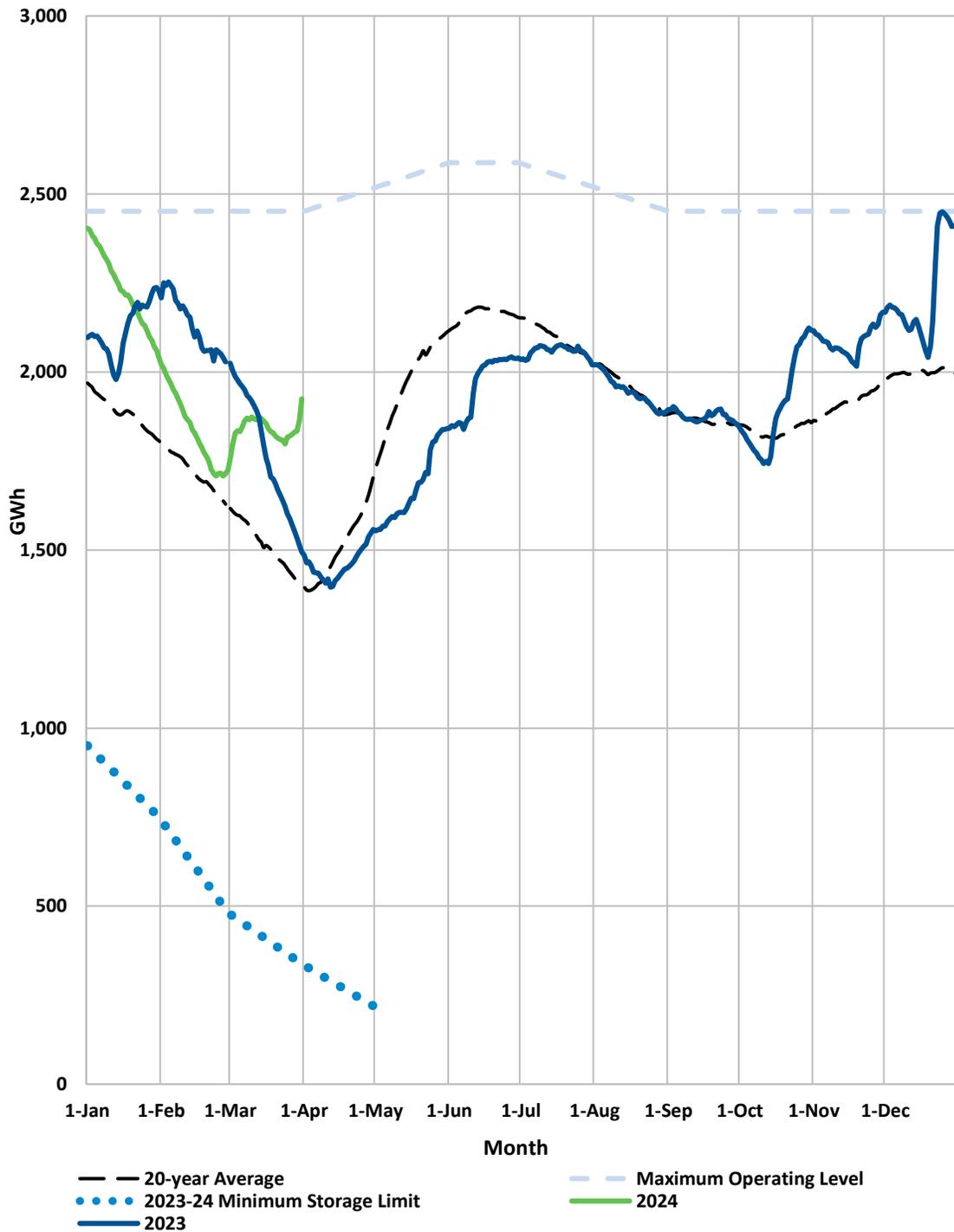


Figure 1: Total System Energy Storage⁴

⁴ Data points in Figure 1 represent storage at the beginning of each day. Table 1 reports the end-of-day storage values, which results in a small difference between the storage data presented in Table 1 and Figure 1.

2.1 Ponding

In Order No. P.U. 49(2018), the Board approved Hydro’s application for approval of a Pilot Agreement for the Optimization of Hydraulic Resources (“Pilot Agreement”).⁵ The intent of the Pilot Agreement is to optimize Hydro’s hydraulic resources through the strategic use of its storage capabilities, taking advantage of the variability of energy pricing in external markets over time.

Appendix A provides information regarding imported and exported energy transactions under the Pilot Agreement during the month; however, no ponding imports or exports occurred in March 2024.

2.2 Spill Activity

Due to high water levels and inflows resulting from mild weather, snowmelt, and rain, spill was required at the Burnt Dam Spillway in March 2024. Releases were required from March 1, 2024 to March 3, 2024, and from March 30, 2024 to March 31, 2024.

A summary of the amount spilled or bypassed in both MCM⁶ and GWh in March 2024, as well as year-to-date (“YTD”) totals can be found in Table 2. There were no opportunities to mitigate spill with energy exports in March 2024, as generation in impacted areas was maximized to the extent possible. Appendix A provides information regarding spill-avoidance export transactions undertaken during the month.⁷

Table 2: Spill Activity⁸

	Granite Canal Bypass		Upper Salmon Bypass		Burnt Dam Spillway	
	MCM	GWh	MCM	GWh	MCM	GWh
31-Mar-2024	-	-	-	-	12.8	8.4
YTD Total	5.9	0.6	3.9	0.5	12.8	8.4

3.0 Production and Purchases

Appendix B provides a breakdown of power purchases, including the import and export activity over the LIL and Maritime Link, and production by plant during March 2024. Deliveries made in March 2024

⁵ The Third Amended and Restated Pilot Agreement for the Optimization of Hydraulic Resources was approved as per Board Order No. P.U. 35(2022), and was extended as per Board Order No. P.U. 30(2023).

⁶ Million cubic metres (“MCM”).

⁷ Pursuant to the Pilot Agreement, exporting when system load is low allows for increased generation from Island hydraulic facilities and the utilization of water (energy) that would have otherwise been spilled, while not increasing the risk of spill elsewhere in the system.

⁸ Numbers may not add due to rounding.

1 under the power purchase agreement with Corner Brook Pulp and Paper Limited (“CBPP”) are also
 2 outlined in Appendix B.⁹ There was no energy repaid from CBPP to Energy Marketing under the
 3 Temporary Energy Exchange Agreement in March 2024.

4 **4.0 Thermal Production**

5 Units 1 and 3 at the Holyrood Thermal Generating Station (“Holyrood TGS”) were online for system
 6 generation requirements during March 2024. Total energy production from the Holyrood TGS was
 7 99.3 GWh during the month. The operating hours for the Holyrood TGS and the Hardwoods,
 8 Stephenville, and Holyrood Gas Turbines are summarized in Table 3. Standby generation was not
 9 required to support reservoir storage.

Table 3: Holyrood TGS and Gas Turbines Operating Hours

	Operating Hours	Synch Condense Hours	Available Hours
Holyrood TGS			
Unit 1	743.1	0	743.1
Unit 2	0	0	0
Unit 3	647.0	0	696.1
Gas Turbines			
Hardwoods	0.9	743.1	744.0
Stephenville	0	0	0
Holyrood	4.6	0	744.0

⁹ On February 1, 2024, Hydro entered into a six-month power purchase agreement with CBPP as per a directive from the Government of Newfoundland and Labrador on January 22, 2024, in Order in Council No. OC2024-013. The power purchase agreement with CBPP provides Hydro with 80 GWh of non-firm energy from February 1, 2024 through July 31, 2024 inclusive.

5.0 Unit Deratings

At the beginning of March 2024, Holyrood TGS Unit 1 was online and derated to 160 MW.¹⁰ On March 6, 2024, the unit was taken offline briefly to replace a faulty fuse holder in the potential transformer cabinet. The unit was returned to service approximately one hour later. The unit continued to operate with a capability of 160 MW for the remainder of March 2024.

Unit 2 at the Holyrood TGS was offline for the entire month of March 2024 due to a forced extension to the planned annual maintenance outage. This was a result of cracking discovered on the low pressure turbine blades.

Unit 3 at the Holyrood TGS was online and operating with full capability until March 27, 2024, when the unit was taken offline for a forced outage due to excessive steam leakage from an attemperator spray block valve. The valve was replaced, and the unit was returned to service with full capability on March 31, 2024.

The Hardwoods and Holyrood Gas Turbines were available for the full month of March 2024.

The Stephenville Gas Turbine remained unavailable during the month of March 2024 due to damage to the generator resulting from the failure of a generator cooling fan. After inspection and testing at the original equipment manufacturers (“OEM”) facility in the United States in December 2023, the rotor was returned to site in February 2024 and reinstalled in the unit on March 5, 2024. The exciter was also returned to site in mid-February 2024; however, it sustained damage during shipping and requires additional repairs. Upon inspection of the exciter, the OEM requires additional testing to ensure the reliability of the repairs. It is expected that the exciter will be returned to site in early May 2024; the unit is estimated to return to service by mid-June 2024.

¹⁰ Work is planned for the 2024 annual outage to restore full capability of the unit for the next operating season.

Appendix A

Ponding and Spill Transactions



Table A-1: Ponding Transactions¹

Date	Ponding Imports (MWh)	Ponding Exports (MWh)	Ponding Imports Purchased by Hydro (MWh)	Transfer of Pond Balance to Spill Avoidance (MWh)	Energy Losses to Export (MWh)	Cumulative Pondered Energy (MWh)
Opening Balance						-
Total ²	-	-	-	-	-	

Table A-2: Avoided Spill Energy¹

Date	Avoided Spill Exports (MWh)	Energy Losses to Export (MWh)	Transfer of Pond Balance to Spill Avoidance (MWh)	YTD Avoided Spill Energy (MWh)
Opening Balance				
Total ²	-	-	-	

¹ Numbers may not add due to rounding.

² As of March 31, 2024.

Appendix B

Production and Purchases



Table B-1: Generation and Purchases (GWh)¹

	March 2024	YTD March 2024
Hydro Generation (Hydro)		
Bay d'Espoir		
Unit 1	40.9	122.9
Unit 2	40.7	122.3
Unit 3	28.7	105.4
Unit 4	13.7	71.2
Unit 5	13.4	72.6
Unit 6	24.3	76.9
Unit 7	69.4	240.4
Subtotal Bay d'Espoir	231.0	811.7
Upper Salmon	58.4	158.6
Granite Canal	27.1	68.1
Hinds Lake	37.0	120.6
Cat Arm		
Unit 1	46.1	134.3
Unit 2	45.7	134.6
Subtotal Cat Arm	91.8	268.8
Paradise River	4.6	7.4
Star Lake	12.9	36.6
Rattle Brook	1.3	2.1
Nalcor Exploits	53.1	153.8
Mini Hydro	0.0	0.0
Total Hydro Generation (Hydro)	517.1	1,627.7
Thermal Generation (Hydro)		
Holyrood TGS		
Unit 1	53.2	160.5
Unit 2	0.0	0.0
Unit 3	46.1	139.2
Subtotal Holyrood TGS Units	99.3	299.8
Holyrood Gas Turbine and Diesels	0.3	4.0
Hardwoods Gas Turbine	0.0	0.1
Stephenville Gas Turbine	0.0	0.0
Other Thermal	0.0	0.0
Total Thermal Generation (Hydro)	99.6	304.0
Purchases		
Requested Newfoundland Power and Vale CBPP	0.0	0.0
Capacity Assistance	0.0	0.5
Power Purchase Agreement	18.4	33.7
Secondary	0.0	1.7
Co-Generation	0.0	10.6
Subtotal CBPP	18.4	46.6
Wind Purchases	16.6	53.5
Maritime Link Imports ²	0.0	0.0
New World Dairy	0.0	0.1
LIL Imports	261.6	842.7
Less: ML Exports ^{3,4}	192.0	534.8
Labrador Island Link Delivery to IIS ^{3,4}	69.6	307.9
Total Purchases	104.7	408.1
Total⁵	721.4	2,339.7

¹ Gross generation.

² Includes energy flows as a result of purchases and inadvertent energy.

³ LIL deliveries to the Island Interconnected System are calculated by total LIL imports of 261.6 GWh less Maritime Link Exports of 192.0 GWh.

⁴ Net energy delivered to the Island Interconnected System is less than the total energy delivery to Hydro under the Muskrat Falls Power Purchase Agreement because of transmission losses on the LIL.

⁵ Actuals reflect rounded values to the nearest tenth of a GWh. Differences between total versus addition of individual components due to rounding.