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October 17, 2023

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 September 2023

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

Shirley A. Walsh
Senior Legal Counsel, Regulatory
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Encl.

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Monthly Energy Supply Report for the Island Interconnected System for September 2023

October 17, 2023

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, as contained in Hydro's Quarterly 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 September 2023.¹

2.0 System Hydrology

Reservoir inflows in September 2023 were 28% 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	2023 (GWh)	2022 (GWh)	20-Year Average (GWh)	Minimum Storage Limit (GWh)	Maximum Operating Level (GWh)	Maximum Operating Level (%)
30-Sep-2023	1,840	2,177	1,822	1,145	2,452	75

The aggregate reservoir storage level on September 30, 2023 was 1,840 GWh, which is 25% below the seasonal maximum operating level and 61% above the minimum storage limit.³ Overall, inflows across

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 hours).

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 Hydro's system in September were approximately 28% above the long-term historical average. Inflows
2 to the reservoirs of the Bay d'Espoir system were 132% of average during the month, while inflows to
3 the Hinds Lake Reservoir were 109% of average. Inflows to the Cat Arm Reservoir were slightly below
4 the long-term historical average at 88% of average. Throughout the first half of September, many of
5 Hydro's reservoirs received steady rain which kept inflows above average, with multiple days of rain in
6 the 10–35 mm range, particularly in the Bay d'Espoir system. Inflows decreased in the second half of
7 September however, with negligible precipitation received during the last week of the month.

8 Bay d'Espoir Unit 5 was offline for a pair of brief planned outages during September. The first of these
9 occurred from September 5 to 7, 2023 and the second planned outage took place from
10 September 17 to 19, 2023. The unit at the Upper Salmon Hydroelectric Generating Station ("Upper
11 Salmon Station"), as well as Bay d'Espoir Unit 6, both remained offline on outage for the full month of
12 September 2023.

13 Figure 1 plots the 2022 and 2023 storage levels, minimum storage limits, maximum operating level
14 storage, and 20-year average aggregate storage for comparison.

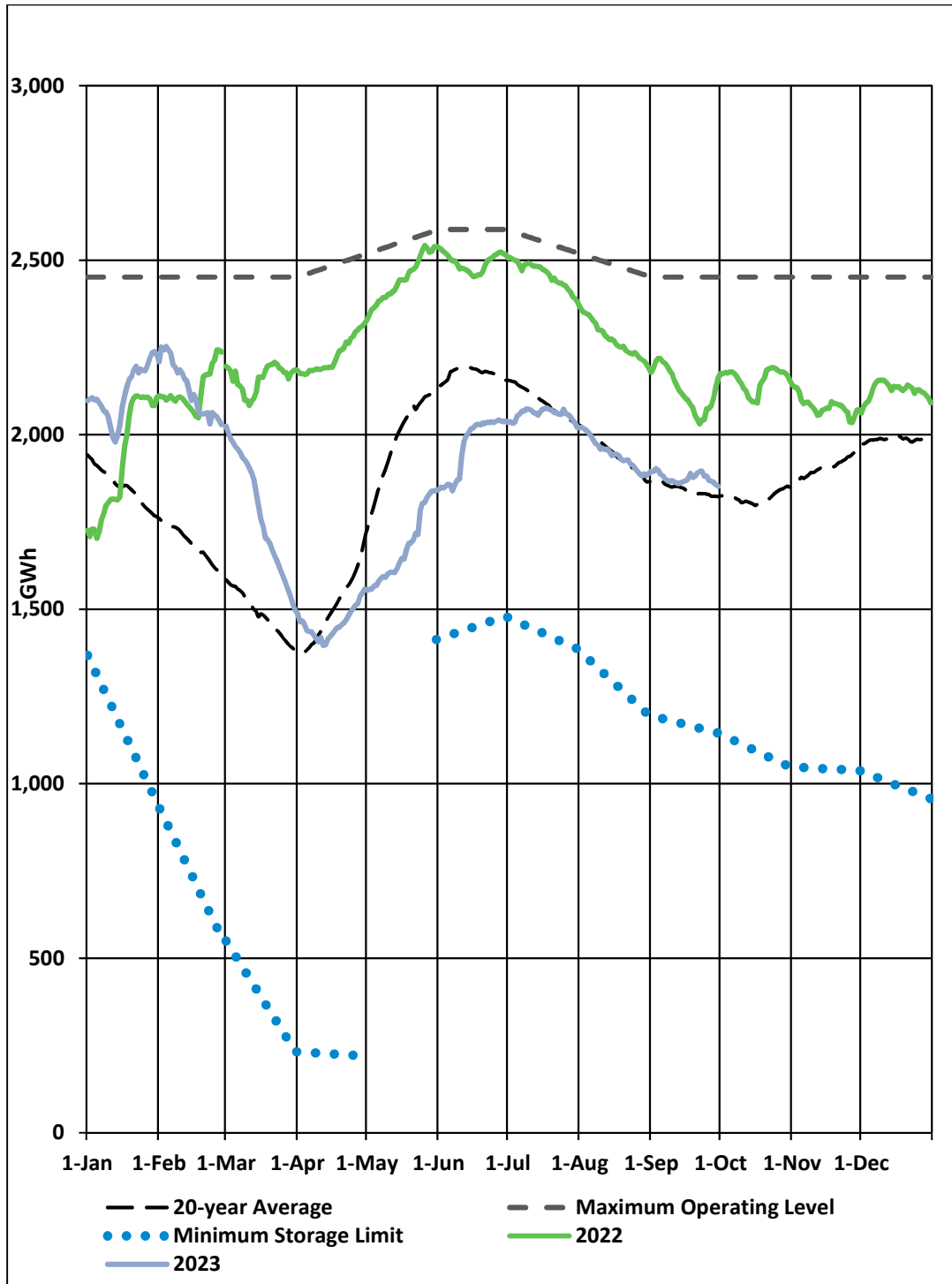


Figure 1: Total System Energy Storage⁴

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),⁵ the Board approved Hydro’s application for approval of a Pilot Agreement for the Optimization of Hydraulic Resources (“Pilot Agreement”).⁶ 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 a log of imported and exported energy transactions under the Pilot Agreement during the month. No ponding imports or exports occurred in September 2023.

2.2 Spill Activity

Bypass flows at North Salmon Spillway continued throughout September 2023 to support Long Pond Reservoir storage while the unit at the Upper Salmon Station is offline. Bypass at this location is expected to continue until the unit at the Upper Salmon Station is released for service, currently estimated for late November 2023. Spill was not required at any additional locations in September 2023.

A summary of the amount spilled or bypassed in both MCM⁷ and GWh for September 2023 as well as year-to-date (“YTD”) totals are provided in Table 2. Appendix A provides a log of spill avoidance export transactions during the month.⁸ Energy exports to mitigate spill were not required in September 2023.

Table 2: Spill Activity⁹

	Burnt Dam Spillway		Granite Canal Bypass		Upper Salmon Bypass		Cat Arm Spillway	
	MCM	GWh	MCM	GWh	MCM	GWh	MCM	GWh
30-Sep-2023	0	0	0	0	316.2	41.2	0	0
YTD Total	122.7	80.8	19.8	1.9	2855.3	372.3	40.7	36.6

⁵ *Public Utilities Act*, RSNL 1990, c P-47, Board Order No. P.U. 49(2018), Board of Commissioners of Public Utilities, December 18, 2018.
⁶ The Third Amended and Restated Pilot Agreement for the Optimization of Hydraulic Resources was approved as per *Public Utilities Act*, RSNL 1990, c P-47, Board Order No. P.U. 35(2022), Board of Commissioners of Public Utilities, December 16, 2022.
⁷ Million cubic metres (“MCM”).
⁸ Pursuant to the Pilot Agreement, exporting when system load is low allows for sustained 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.
⁹ Numbers may not add due to rounding.

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 September 2023. Corner Brook Pulp and Paper (“CBPP”) repaid 0.2 GWh of energy to Energy Marketing as per the Temporary Energy Exchange Agreement during the month of September 2023. This energy was also exported over the Maritime Link.

4.0 Thermal Production

No Holyrood Thermal Generating Station (“Holyrood TGS”) units were online for generation requirements during September 2023 and total energy production from the Holyrood TGS was 0 GWh during the month. Unit 3 at the Holyrood TGS operated in sync condense mode for a total of 169.7 hours during September. The operating hours for the Holyrood TGS and the Hardwoods, Stephenville, and Holyrood Gas Turbines are summarized in Table 3. Standby generation was not required to support reservoir storage. Operation of the Holyrood Gas Turbine during the month was for testing purposes, as well as due to transmission lines TL201/TL217 transmission limits.

Table 3: Holyrood TGS and Gas Turbines Operating Hours

	Operating Hours	Synch Condense Hours	Available Hours
Holyrood TGS			
Unit 1	0	0	0
Unit 2	0	0	0
Unit 3	0	169.7	169.7
Gas Turbines			
Hardwoods	0	720.0	720.0
Stephenville	0	0	0
Holyrood	6.8	0	712.1

5.0 Unit Deratings

Unit 1 at the Holyrood TGS was offline for the planned annual maintenance outage for the entire month of September 2023.

Unit 2 at the Holyrood TGS was offline for the planned annual maintenance outage, which was scheduled to conclude on September 23, 2023. The unit remained offline on a forced extension to the planned outage for the remainder of September as a result of cracking discovered on the low pressure turbine blades.¹⁰

Unit 3 at the Holyrood TGS was offline for the total plant outage from August 15 to September 23, 2023. On September 23, 2023 it was returned to service in synchronous condenser mode and remained online as a synchronous condenser for the remainder of September.

The Hardwoods Gas Turbine was available for the full month of September 2023.

The Holyrood Gas Turbine was available at full capacity for the entire month of September 2023 with the exception of a planned outage on September 15, 2023 to replace faulty disc cavity thermocouples.

The Stephenville Gas Turbine remained unavailable during the full month of September 2023, due to damage to the generator resulting from the failure of a generator cooling fan. The exact return to service date is currently unknown, but is currently estimated to be January 2024.

¹⁰ As previously reported in “2023–2024 Winter Readiness Planning Report,” Newfoundland and Labrador Hydro, October 13, 2023, cracking on the low pressure blades on Unit 2 turbine at the Holyrood TGS will render the unit unavailable until mid-March 2024.

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)	Cumulative Avoided Spill Energy (MWh)
Opening Balance				73,427
Total ²	-	-	-	

¹ Numbers may not add due to rounding.

² As of September 30, 2023.

Appendix B

Production and Purchases



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

	September 2023	YTD September 2023
Hydro Generation (Hydro)		
Bay d'Espoir		
Unit 1	40.4	370.0
Unit 2	38.7	366.0
Unit 3	31.9	237.0
Unit 4	16.6	187.6
Unit 5	10.1	165.0
Unit 6	0.0	163.4
Unit 7	46.8	561.9
Subtotal Bay d'Espoir	184.4	2,050.9
Upper Salmon	0.0	108.9
Granite Canal	21.1	184.0
Hinds Lake	33.8	308.2
Cat Arm		
Unit 1	31.5	270.7
Unit 2	31.2	304.5
Subtotal Cat Arm	62.7	575.2
Paradise River	2.2	21.4
Star Lake	9.3	107.3
Rattle Brook	1.4	12.2
Nalcor Exploits	41.5	473.6
Mini Hydro	0.0	0.0
Total Hydro Generation (Hydro)	356.3	3,841.7
Thermal Generation (Hydro)		
Holyrood TGS		
Unit 1	0.0	150.9
Unit 2	0.0	200.8
Unit 3	0.0	126.2
Subtotal Holyrood TGS Units	0.0	477.9
Holyrood Gas Turbine and Diesels	0.3	15.1
Hardwoods Gas Turbine	0.0	1.6
Stephenville Gas Turbine	0.0	1.5
Other Thermal	0.0	0.3
Total Thermal Generation (Hydro)	0.3	496.4
Purchases		
Requested Newfoundland Power and Vale CBPP	0.0	0.1
Capacity Assistance	0.0	0.0
Firm Energy Power Purchase Agreement	0.0	0.0
Secondary	2.8	23.0
Co-Generation	2.1	30.4
Subtotal CBPP	4.9	53.3
Wind Purchases	10.9	127.8
Maritime Link Imports ²	0.0	0.2
New World Dairy	0.1	1.7
LIL Imports ³	121.9	1,906.8
Maritime Link Exports ^{4,5}	110.2	1,357.4
Net LIL Delivery to IIS ⁶	11.7	549.4
Total Purchases	137.8	2,089.9
Total⁷	494.4	6,428.1

¹ Gross generation.

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

³ Includes purchases as a result of testing activity as well as deliveries that are then exported over the Maritime Link.

⁴ Totals include the provision of emergency and inadvertent energy to Nova Scotia Power Inc., provision of the Nova Scotia Block, the Supplemental Block, and export activity conducted by Energy Marketing including the export of CBPP repaid energy and spilled energy on Hydro's behalf.

⁵ Physical delivery of the Nova Scotia Block will only occur when the LIL is online and able to transfer power. CBPP energy repaid to Energy Marketing may be used to supply the Nova Scotia Block while the LIL is offline.

⁶ 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.

⁷ Actuals reflect rounded values to the nearest tenth of a GWh. Differences between total versus addition of individual components due to rounding.