Environment and
Climate Change Canada

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CANADA – NEWFOUNDLAND AND LABRADOR

MEMORANDUM OF AGREEMENT FOR WATER QUANTITY SURVEYS

REPORT FOR FISCAL YEAR 2021-2022

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LETTER OF TRANSMITTAL

TO: Jean-François Cantin
Administrator for Canada

Haseen Khan
Administrator for the Department of Environment and Climate Change, Newfoundland and Labrador

We hereby submit an annual report for the fiscal year 2021-2022 covering activities under the Memorandum of Agreement for Water Quantity Surveys for Newfoundland and Labrador.

Members
Coordinating Committee

Government of Canada

Rene Savoie

Digitally signed by: Rene Savoie
DN: CN = Rene Savoie email = rene.savoie@ec.gc.ca C = CA O = ECCC OU = NHS
Date: 2023.01.20 09:49:17 -04'00'

René Savoie
Environment Canada and Climate Change

Government of Newfoundland and Labrador

Paula Dawe

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Date: 2023.01.20 10:26:57 -03'30'

Paula V Dawe
Dept. of Environment and Climate Change, Newfoundland and Labrador

EXECUTIVE SUMMARY

In 1975, Canada and its provincial partners signed Memoranda of Agreement for Water Quantity Surveys. The purpose of the Agreement is to provide a mechanism to harmonize the hydrometric data collection, processing and distribution, as well as a procedure to cost-share the activities of the program.

The COVID-19 pandemic continued in 2021-22, which continued to affect various aspects of the operation of the hydrometric network including access to Labrador, fewer station visits, only one field technician per vehicle, lower actual costs, and delays in infrastructure renewal projects.

During this reporting period, one provincial station was closed. More details on these stations are given in section 3 of this report.

In addition to the regular hydrometric activities, a survey of site conditions was done during fiscal year 2021-2022.

Currently 110 stations, over 99% of the network, are equipped with satellite telemetry and 1 station has modem telemetry using standard phone lines which means that 98% of the network is reporting in real-time. Only 1 station has no telemetry.

The actual share of the province ($999K) was 2.7% higher than the original estimate plus the provincial contribution in equipment ($1027K). Financial details are given in section 5 of this report.

1. INTRODUCTION

This report covers the activities under the Canada/Newfoundland and Labrador Memorandum of Agreement for Water Quantity Surveys for the fiscal year 2021-2022.

The operation of an integrated network of hydrometric stations in Newfoundland and Labrador is cost-shared between Water Survey Division, Meteorological Service of Canada, Environment Canada (DOE), and Newfoundland and Labrador, Department of Environment and Climate Change under a Memorandum of Agreement (MOA).

The core of this report has been divided in 5 main sections:

The *Hydrologic Conditions* section provides a brief description of the hydrologic conditions that were encountered during 2021-2022.

The *Coordinators Meeting* section highlights the discussions undertaken during the year.

The *Network Characteristics* section includes a brief summary of the changes from the previous year. Also available is a breakdown of the responsibility classification for each category as well as a description of the other operational activities such as sediment, real-time, etc.

The *Operations* section includes a brief description of the operational activities for the year. This section lists the details of partner shares and invoices issued, as agreed to in Schedule D Estimates (Appendix B).

The report also includes a section on *Construction and Projects* which contains a brief description of the special projects.

In addition, the following Appendices have been included:

Appendix A SCHEDULE C STATION LISTING 2021-2022
Appendix B SIGNED SCHEDULE D 2021-2022
Appendix C Summary of Cumulative Annual Costs 1975-76 to 2021-2022
Appendix D Hydrometric Infrastructure and Construction in Atlantic Canada Project Summary Report 2021–2022

2.0 HYDROLOGIC CONDITIONS

Streamflow and Water Level Conditions

Below are flow tables based on Apr-Dec 2021 approved data and Jan-Mar 2022 preliminary data for five major rivers in Newfoundland and Labrador. Historical Extremes updated to 2021 data. The final information can be found online for all monitored sites in Newfoundland and Labrador at: www.wateroffice.ec.gc.ca

Rocky River 02ZK001 (Eastern NL)
(Drainage Area 301 KM2)

Year	MEAN FLOW	FOR THE		HISTORICAL EXTREMES **			
2021/2022	(M/3S)	MONTH					
		MAXIMUM	MINIMUM	MONTHLY		DAILY	
		(DAY)	(DAY)	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM
				(YEAR)	(YEAR)	(YEAR)	(YEAR)
April	11.3	33.9	4.37	35.8	7.89	133	1.8
2021	D	(11)	(26)	(1964)	(1979)	(2004)	(1959)
May	2.64	5.37	1.22	25.7	3.51	91.6	1.5
2021	DR	(1)	(22) R	(1985)	(1962)	(1985)	(1962)
June	2.17	4.52	1.2	18.5	2.04	87.1	0.65
2021	D	(5)	(3)	(1990)	(1957)	(1988)	(1951)
July	6.25	40.4	0.733	13.8	0.81	93.9	0.42
2021		(21)	(18)	(1981)	(1949)	(1988)	(1949)
August	4.33	14.8	1.75	30.6	0.548	199	0.2
2021		(1)	(24)	(1970)	(1949)	(2007)	(1950)
September	7.7	33.1	1.84	19.6	0.628	216	0.24
2021		(20)	(2)	(2004)	(1961)	(2004)	(1961)
October	9.89	24.5	4.21	27.2	3.68	124	0.69
2021		(1)	(18)	(1970)	(1949)	(1953)	(1961)
November	16.1	49.4	3.78	25.8	3.95	125	1.9
2021		(16)	(5)	(1956)	(1948)	(1956)	(1948)
December	18.5	58.4	6.12	31.1	7.53	174	2.6
2021	E	(12)	(27)	(1953)	(1986)	(1953)	(1961)
January	23.4	173	6.17	28.7	4.77	146	1.8
2022	E	(30) R	(1)	(1952)	(1988)	(1951)	(2010)
Feburary	33.7	203	9.65	36.9	2.26	294	1.2
2022	E	(5)	(28)	(1962)	(1975)	(1962)	(1961)
March	12.4	58	5.45	39.8	3.2	200	0.93
2022		(13)	(7)	(1994)	(1963)	(1994)	(1963)

Deficiency for the period or daily number. 25% are less than the lower quartile (below normal)

Excessive for the period or daily number. 25% are greater than the upper quartile (above normal)

Record for the period or daily number (Preliminary)

Gander River 02YQ001 (Central NL)
(Drainage Area 4450 KM2)

Year	MEAN FLOW	FOR THE		HISTORICAL EXTREMES **			
2021/2022	(M/3S)	MONTH					
		MAXIMUM	MINIMUM	MONTHLY		DAILY	
		(DAY)	(DAY)	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM
				(YEAR)	(YEAR)	(YEAR)	(YEAR)
April	413	772	152	513	44.4	925	22.8
2021	E	(14)	(30)	(1987)	(1967)	(1993)	(1950)
May	81.7	145	50.7	451	90.3	761	50.4
2021	DR	(1)	(23)	(1967)	(1958)	(2001)	(2006)
June	32.3	55.2	18.8	198	37.7	336	18.1
2021	DR	(1)	(30)	(2009)	(1979)	(2010)	(1979)
July	13.4	17.9	10.8	148	13.9	206	9
2021	DR	(2)	(25)	(2010)	(1975)	(2006)	(1975)
August	10.8	13.8	8.95	179	6.92	378	4.8
2021	D	(6)	(28)	(1980)	(1987)	(1980)	(1987)
September	52.1	83.4	9.49	196	4.16	527	2.8
2021		(23)	(2)	(1984)	(1961)	(2004)	(1961)
October	78.8	114	57.6	269	9.88	597	3.3
2021		(28)	(15)	(1981)	(1950)	(2003)	(1961)
November	96	128	69.1	242	37.2	398	14.8
2021	D	(23)	(12)	(1962)	(1961)	(2003)	(1961)
December	185	281	93.8	272	36.9	549	28.4
2021	E	(14)	(31)	(2004)	(1985)	(1977)	(1985)
January	228	479	84.2	352	36.3	1170	25.3
2022	E	(20)	(3)	(1983)	(1985)	(1983)	(1985)
Feburary	240	502	118	288	18.6	688	14.8
2022	E	(21)	(17)	(1969)	(1961)	(1984)	(1961)
March	176	253	83.2	275	17.2	560	9.8
2022	E	(16)	(12)	(1988)	(1950)	(1992)	(1961)

Deficiency for the period or daily number. 25% are less than the lower quartile (below normal)

Excessive for the period or daily number. 25% are greater than the upper quartile (above normal)

Record for the period or daily number (Preliminary)

Upper Humber River 02YL001 (Western NL)
(Drainage Area 2110 KM2)

Year	MEAN FLOW	FOR THE		HISTORICAL EXTREMES **			
2021/2022	(M/3S)	MONTH					
		MAXIMUM	MINIMUM	MONTHLY		DAILY	
		(DAY)	(DAY)	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM
				(YEAR)	(YEAR)	(YEAR)	(YEAR)
April	202	349	89.6	288	19.2	749	9.2
2021	E	(8)	(1)	(1934)	(1967)	(1987)	(1955)
May	116	200	54.3	383	127	879	35.8
2021	DR	(11)	(21)	(1993)	(1983)	(1993)	(1983)
June	35	160	8.32	354	25.8	1010	8.5
2021	D	(30)	(26) R	(1933)	(1979)	(1984)	(1951)
July	73.7	271	24.9	140	9.3	555	3.9
2021	E	(24)	(17)	(1939)	(1987)	(1933)	(1986)
August	54.2	175	13.2	103	3.91	447	1.6
2021		(7)	(30)	(1973)	(1940)	(1973)	(1940)
September	123	292	17	162	15.2	504	1.6
2021	E	(4)	(1)	(1944)	(1946)	(1955)	(1940)
October	116	317	24.5	167	24.7	530	8
2021	E	(20)	(17)	(1977)	(1948)	(1957)	(1954)
November	76.5	148	33.1	177	42.6	813	8.8
2021		(26)	(11)	(1962)	(1986)	(1935)	(1948)
December	105	248	26.1	156	11.4	736	6.8
2021	E	(9)	(31)	(1954)	(1986)	(1935)	(1986)
January	91.7	190	24.3	129	10.2	663	4
2022	E	(19)	(1)	(1950)	(1971)	(1983)	(1990)
Feburary	66.8	191	30.1	106	5.91	348	3.7
2022	E	(21)	(15)	(1969)	(1975)	(1969)	(1993)
March	54.4	155	11.5	141	7.8	530	4
2022	E	(17)	(11)	(1979)	(1959)	(1936)	(1992)

Deficiency for the period or daily number. 25% are less than the lower quartile (below normal)

Excessive for the period or daily number. 25% are greater than the upper quartile (above normal)

Record for the period or daily number (Preliminary)

02ZB001 Isle Aux Morts River (South Western NL)
(Drainage Area 205 KM2)

Year	MEAN FLOW	FOR THE		HISTORICAL EXTREMES **			
2021/2022	(M/3S)	MONTH					
		MAXIMUM	MINIMUM	MONTHLY		DAILY	
		(DAY)	(DAY)	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM
				(YEAR)	(YEAR)	(YEAR)	(YEAR)
April	52.7	213	8.81	46.3	3.62	325	0.696
2021	ER	(3)	(17)	(1994)	(1967)	(2003)	(2004)
May	13.6	58.3	2.65	51.1	6.16	226	2.18
2021	D	(23)	(21)	(1994)	(1986)	(1972)	(2010)
June	7.71	48.2	1.4	34.7	2.58	259	0.79
2021		(27)	(16)	(1972)	(1976)	(1985)	(1976)
July	7.76	25.5	1.78	22.7	1.17	102	0.35
2021		(23)	(19)	(1981)	(1989)	(1993)	(1989)
August	3.04	11.5	0.583	17.9	1.39	124	0.34
2021	D	(3)	(30)	(2007)	(1978)	(1990)	(1978)
September	18.6	77	1.11	23.7	3.53	176	0.71
2021	E	(27)	(1)	(1998)	(1973)	(2005)	(1969)
October	11.4	40.5	1.46	31	5.65	178	1.13
2021		(24)	(17)	(1972)	(1963)	(1977)	(2001)
November	43.8	470	2.87	38.3	7.7	348	1.6
2021	ER	(24) R	(10)	(1967)	(2000)	(2006)	(1970)
December	24.8	139	4.32	43	3.13	434	0.83
2021	E	(7)	(31)	(1990)	(1994)	(1990)	(2007)
January	26.6	95.5	3.88	24	1.22	219	0.57
2022	ER	(6)	(28)	(1986)	(1991)	(1986)	(1991)
Feburary	15.7	118	2.74	31.1	0.923	243	0.41
2022	E	(19)	(28)	(1996)	(1975)	(1996)	(1991)
March	8.01	81.6	1.97	38.9	0.737	410	0.34
2022		(13)	(2)	(1979)	(2004)	(1996)	(1987)

Deficiency for the period or daily number. 25% are less than the lower quartile (below normal)

Excessive for the period or daily number. 25% are greater than the upper quartile (above normal)

Record for the period or daily number (Preliminary)

03QC001 Eagle River (Labrador)
(Drainage Area 10900 KM2)

Year	MEAN FLOW	FOR THE		HISTORICAL EXTREMES **			
2021/2022	(M/3S)	MONTH					
		MAXIMUM	MINIMUM	MONTHLY		DAILY	
		(DAY)	(DAY)	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM
				(YEAR)	(YEAR)	(YEAR)	(YEAR)
April	602	979	57.3	311	8.33	2460	7.2
2021	ER	(15)	(2)	(2010)	(1993)	(1983)	(1993)
May	927	1280	763	1400	106	2690	11.8
2021		(24)	(15)	(1971)	(1967)	(1971)	(1975)
June	718	889	517	1810	265	2990	127
2021		(9)	(16)	(1985)	(2005)	(1985)	(2005)
July	223	630	87.4	638	119	1330	71.4
2021		(1)	-31	(1985)	(1976)	(1980)	(1976)
August	86.2	106	70.5	495	102	1320	64
2021	DR	(30)	(27)	(1989)	(1988)	(1967)	(2008)
September	257	419	101	521	84.1	827	59
2021		(18)	(1)	(1976)	(1984)	(1976)	(1984)
October	226	287	169	515	100	705	78.4
2021		(6)	(19)	(1978)	(1973)	(1966)	(1973)
November	197	713	90.5	488	65.3	695	51
2021		(30) R	(22)	(1995)	(2002)	(1980)	(1974)
December	266	725	145	218	36.3	410	27.5
2021	ER	(1) R	(31)	(1995)	(1974)	(2005)	(1974)
January	93.7	141	57	98.9	22.4	108	19
2022	E	(1) R	(31)	(1969)	(1975)	(1969)	(1993)
Feburary	39	55.4	31.2	86.2	14.9	90.6	11.8
2022		(1)	(28)	(1969)	(1993)	(1969)	(1993)
March	29.1	31	28.3	78.7	9.64	119	8.2
2022		(1)	(31)	(1969)	(1993)	(1979)	(1993)

Deficiency for the period or daily number. 25% are less than the lower quartile (below normal)

Excessive for the period or daily number. 25% are greater than the upper quartile (above normal)

Record for the period or daily number (Preliminary)

3.0 COORDINATORS MEETINGS

The coordinators met in person once and were in frequent communication via e-mail correspondence and conference calls. Discussions ranged from operating costs, capital plan, and priority of stations.

Also, during the fiscal year 2021-22, the Newfoundland and Labrador (NL) Strategic Planning Working Group was initiated out of a need for strategic long-term planning of the hydrometric program that was recognized by both the Water Resources Management Division (WRMD) of the Newfoundland and Labrador Department of Environment and Climate Change (NLECC) and the Water Survey of Canada (WSC) of the National Hydrological Service (NHS) of Environment and Climate Change Canada (ECCC). The objectives of the group were to:

i. Work towards increased transparency and resource sharing between NHS and WRMD;
ii. Collectively develop an understanding of the cost variables and operational challenges in the NL Hydrometric Program;
iii. Enable identification of potential mitigation measures for cost increases including unrealized efficiencies;
iv. Develop a range of strategic scenarios for the future management of the program and possible outcomes of each approach from an affordability and human resource perspective; and
v. Recommend interim steps necessary to fulfill the strategic scenarios moving forward to meet the hydrological monitoring needs of the province of NL.

The Working Group worked together towards systemically identifying potential solutions to operational challenges and fiscal constraints. The strategic management approaches explored were intended to be within the framework of sustainability, both in terms of financial and human resource capacities. The Working Group aimed to chart the path forward collaboratively for the sustainable management of the hydrometric program in Newfoundland and Labrador while meeting the hydrological monitoring needs of the data users.

The Working Group was comprised of key representatives of both WRMD and NHS who have operational knowledge and expertise on the hydrometric program in Newfoundland and Labrador. The Working Group members included Paula Dawe (Manager – Drinking Water & Wastewater Section, WRMD), Janice McCarthy (Environmental Engineer, WRMD), Daniel Humber (Environmental Engineer, WRMD), René Savoie (District Manager, Hydrometric Operations Atlantic, NHS), Luc Bernard (Head of Operations, Hydrometric Operations Atlantic, NHS), Perry Pretty (Hydrometric Supervisor, NL, NHS), Aaron Thompson (Manager, Engineering, Technical and Data Services East, NHS), Derek Elliott (Senior Engineer, Innovation Technologies, NHS), Jean-François Cantin (Chief Hydrological Operations Eastern Canada, NHS) and Jenny Hayward (Engineer, NHS).

The Working Group was facilitated with a series of bi-weekly meetings hosted virtually on MS Teams between December 2021 and May 2022 (total of 10 meetings equivalent to 2 full working days). Each meeting focused on a specific element of the hydrometric operations and working group members collaboratively examined costs associated with each of the operational cost drivers. Members also took turns presenting on various topics (e.g., human

resources, air charter logistics and costs, equipment purchasing, provincial and federal perspectives of the program, program costing analysis, etc.). A draft report titled "Hydrometric Program Strategic Planning Working Group Report – Newfoundland and Labrador" was co-authored by members of the working group from both WRMD and NHS. This report summarizes the NL operational management and cost drivers and presented various strategic management scenarios. The report findings were co-presented by Dawe and Hayward to all the Atlantic program administrators and key stakeholders at a Face-to-Face meeting with Atlantic Canadian provincial partners in June 2022.

The findings of the Working Group have been instrumental to help chart a sustainable operational path forward for the hydrometric program operation in Newfoundland and Labrador. The costing analysis developed as a deliverable of the report has been used to support budgetary funding requests. This type of in-depth and collaborative engagement between a provincial partner and NHS was a worthwhile effort and enabled us to proactively envision the future of the program on a longer term time frame of the next 5 to 10 years. We anticipate the groundwork founded in the Working Group will continue to be built upon to ensure a collaborative program management approach moving forward together.

4.0 NETWORK CHARACTERISTICS

Water Survey of Canada operates 113 hydrometric stations in Newfoundland and Labrador. The station classifications are listed in the next Table. ‘

In 2021-22, one provincial station was decommissioned:

- Little Barachois River Near Placentia 02ZK003

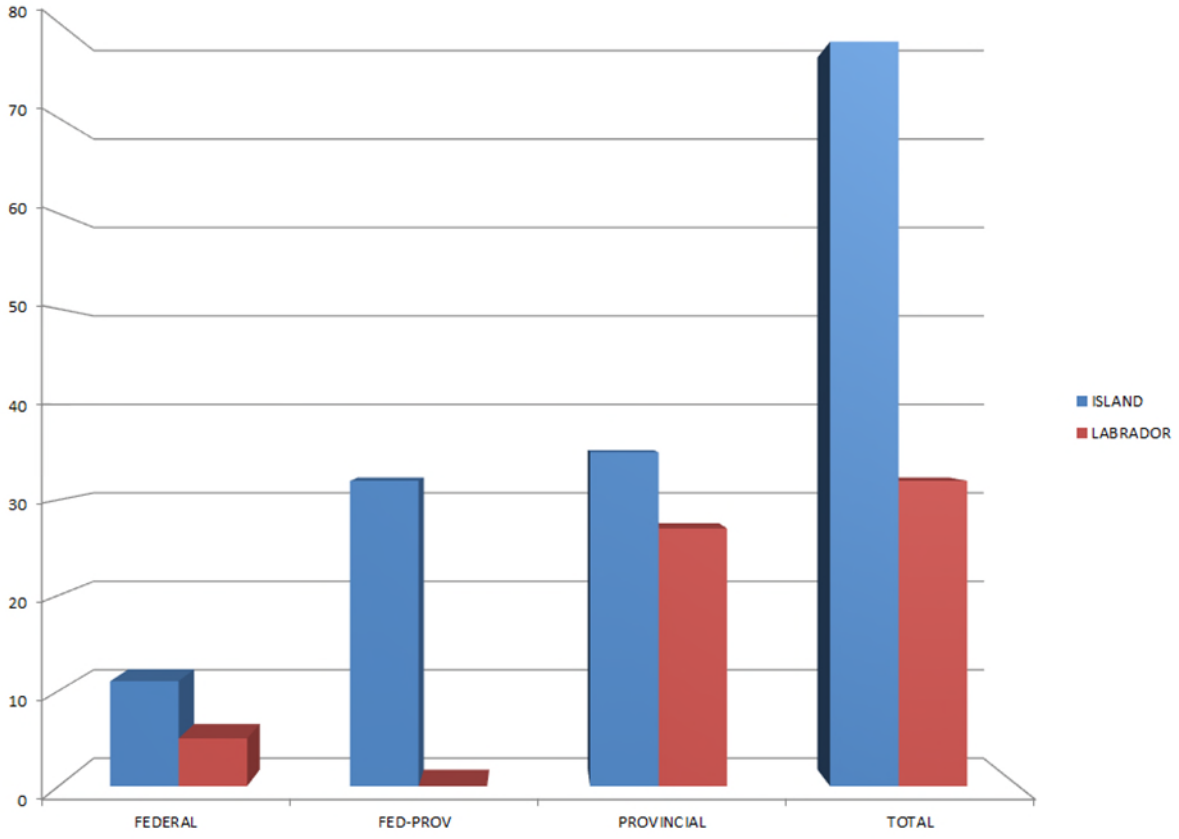
The province currently operates 4 Provincial-Contributed stations, which are listed in Appendix A.
Water Survey of Canada also takes water samples at 5 different sites for water quality purposes on behalf of the Newfoundland and Labrador Department of Environment and Climate Change. These sites are converted in station units in order to have their cost calculated under this agreement.

Under the Canada–Newfoundland and Labrador Memorandum of Agreement, 110 stations were operated in 2021-2022. The complete station list is available in Appendix A. The stations classifications are as follow:

Table 3.1: *Station classification based on Newfoundland and Labrador*

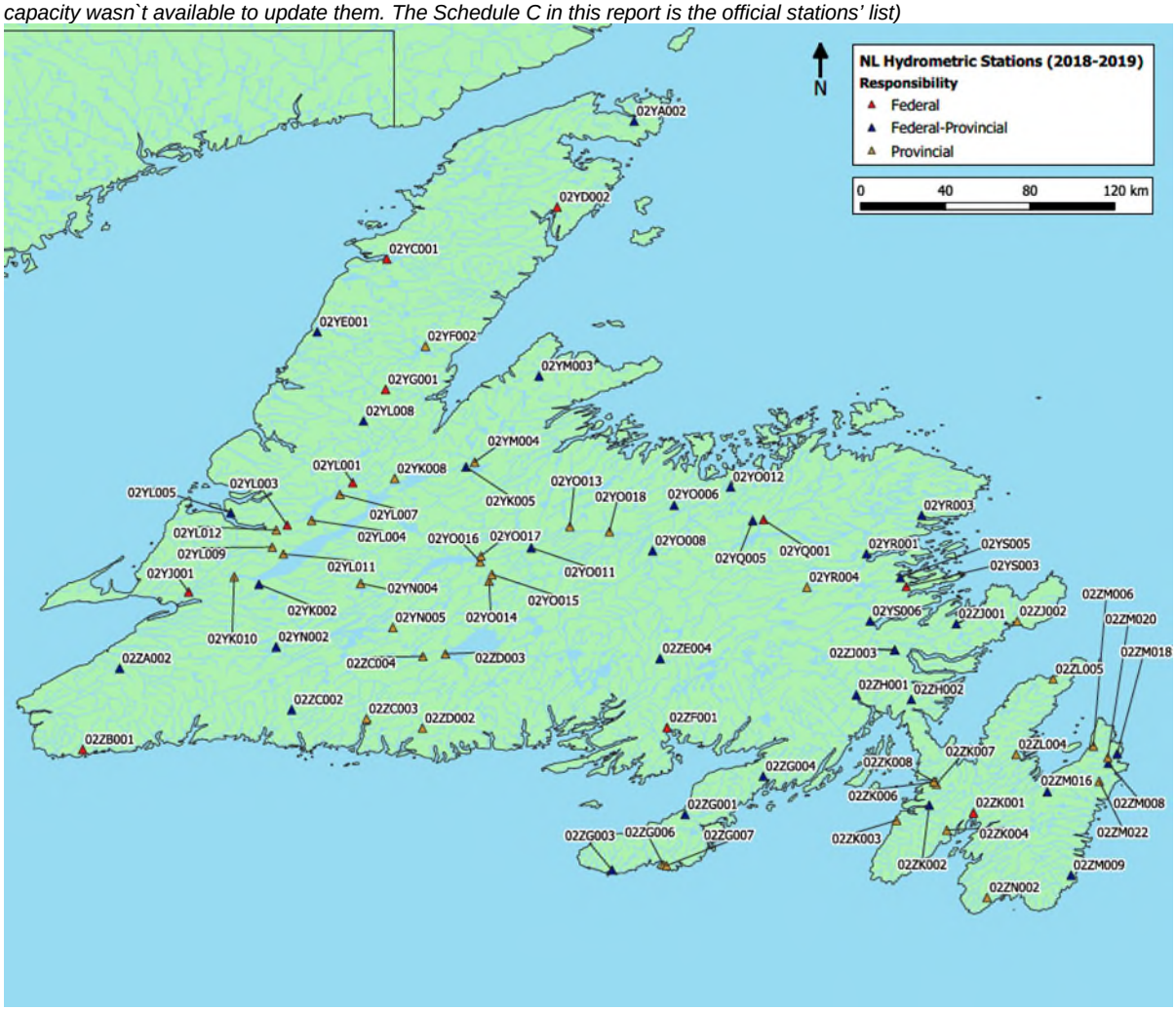
NEWFOUNDLAND AND LABRADOR			
CLASSIFICATION	**ISLAND**	**LABRADOR**	**TOTAL**
FEDERAL	11	5	**16**
FED-PROV	32	0	**32**
PROVINCIAL	35	27	**62**
TOTAL	**78**	**32**	**110**

Graph 3.1: *Distribution of station classification for Newfoundland and Labrador*



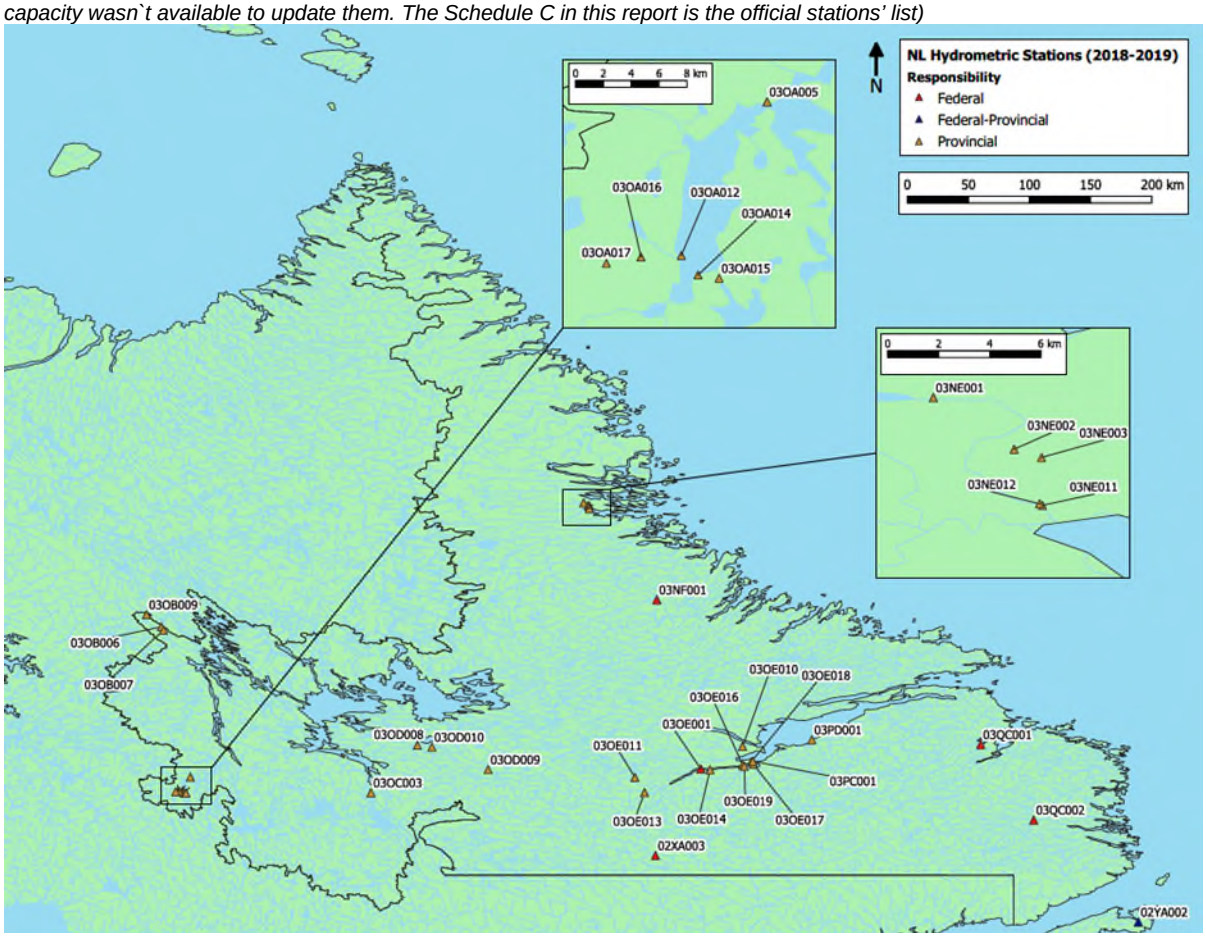
Graph 3.2: *Location and designation of the hydrometric network in Newfoundland*

Please note that this map is for reference only and are showing stations for the fiscal year 2018-2019. Due to Covid, GIS capacity wasn`t available to update them. The Schedule C in this report is the official stations' list)



Graph 3.3: *Location and designation of the hydrometric network in Labrador*

Please note that this map is for reference only and are showing stations for the fiscal year 2018-2019. Due to Covid, GIS capacity wasn`t available to update them. The Schedule C in this report is the official stations' list)



5.0 OPERATIONS

A true costing approach has been utilized to derive the station costs for this fiscal year in accordance with the agreement. The costs were apportioned based on the station classification and then totaled to determine each parties share. Employee benefit costs on salary and data management costs have been included and attributed to all parties as agreed on by the National Administrator's meeting in Quebec City, October 1999. The Newfoundland and Labrador Department of Environment and Climate Change was credited with the total amount of $34,321 for the contribution to the Partnership. The details of those contributions are listed in the next table.

The following table summarizes the estimated and the actual costs to operate the provincial share of the stream gauging network in Newfoundland and Labrador for 2021-2022.

STREAMFLOW AND WATER LEVEL COSTS FOR NEWFOUNDLAND AND LABRADOR

	2021/22	2021/22
OPERATIONAL	**Planned**	**Actuals**
Salaries (Including benefits 27%)	$ 606,344	$ 648,335
Hydrometric Operations O&M	$ 354,574	$348,824
Capital	$59,563	$64,179
Real Property Credit	-$9,600	-$9,600
Real Time Web Cam	-$7,350	-$7,350
Weather Station	-$4,305	-$4,305
Equipment purchased by the province *		-$13,066
TOTALS	**$ 999,226**	**$1,027,017**

* The equipment purchased by the province was not part of the signed schedule D but it accounted for a provincial contribution to the program. In FY 21/22, 3 FTS loggers and one bubbler were purchased by the province and handed to WSC for a total of $43,554. WSC is giving a 30% credit of the total value which is the federal portion of the network.

SUMMARY OF TOTAL EXPENDITURES 2021-2022

CATEGORY	FEDERAL	NEWFOUNDLAND AND LABRADOR	TOTAL
Hydrometric operations (O&M)	$ 148,145	$348,824	**$496,969**
Capital	39,449	$64,179	**$103,628**
Salaries + 27%	$286,938	$ 648,335	**$935,273**
Construction & Major Maintenance	$ 437,959		**$437,959**
TOTAL	**$912,491**	**$1,061,338**	**$1,973,829**

The signed version of the Schedule D can be found in the Appendix B

O&M Expenditures Details

ITEM	EXPENDITURE (Fiscal year 21/22)
112 - MINERAL PRODUCTS	14,782
022 - TELECOMMUNICATION SERVICES	4,416
021 - POSTAGE, FREIGHT, EXPRESS, AND CARTAGE	9,678
040 - BUSINESS SERVICES	6,123
070 - UTILITY SERVICES	1,312
025 - TRAVEL-PUBLIC SERVANTS	43,441
325 - MISCELLANEOUS EXPENDITURES	223
065 - REPAIR OF MACHINERY AND EQUIPMENT	20,427
122 - ACQUISITION OF INFORMATICS EQUIPMENT AND PARTS	117
117 - MISCELLANEOUS GOODS AND PRODUCTS	4,350
124 - ACQUISITION OF EQUIPMENT AND FURNITURE INCLUDING PARTS	33,902
046 - PROTECTION SERVICES	3,574
056 - RENTAL OF AIRCRAFT AND SHIPS	191,923
044 - TRAINING AND EDUCATIONAL SERVICES	170
043 - SCIENTIFIC AND RESEARCH SERVICES	10,471
115 - PERSONAL GOODS	1,395
053 - RENTAL OF MACHINERY	311
121 - ACQUISITION OF MACHINERY AND MACHINERY PARTS	633
116 - METALS AND METAL PRODUCTS	1,146
082 - SPECIAL FEES AND SERVICES	120
026 - TRAVEL-NON-PUBLIC SERVANTS	310
TOTAL	**$ 348,824.00**

6.0 CONSTRUCTION & SPECIAL PROJECTS

For fiscal year 21-22, the overall strategy for infrastructure and construction in Newfoundland and Labrador is to prioritize renewal work at sites with multiple issues. These priorities include the following: decommissioning inactive cableways, assessing and remediation of environmental liabilities, decommissioning inactive stilling wells with poor-condition shelters, replacing poor-condition shelters with OHS issues, and dismantling inactive station shelters.

The province undertook GNSS surveys for CVGD2013 datum conversion at the following sites in 2021-22:

02YL009	CORNER BROOK LAKE AT LAKE OUTLET
02YL012	STEADY BROOK ABOVE CONFLUENCE TO HUMBER RIVER
02YL001	UPPER HUMBER RIVER NEAR REIDVILLE
02YL004	SOUTH BROOK AT PASADENA
02YO018	EXPLOITS RIVER AT CHARLIE EDWARDS POINT
02YK005	SHEFFIELD BROOK NEAR TRANS CANADA HIGHWAY
02YO017	RED INDIAN LAKE AT INDIAN POINT
03OE016	CHURCHILL RIVER AT HAPPY VALLEY
03OE011	PINUS RIVER
03OE013	CHURCHILL RIVER ABOVE GRIZZLE RAPIDS
03OE001	CHURCHILL RIVER ABOVE UPPER MUSKRAT FALLS
03OE018	CHURCHILL RIVER AT END OF MUD LAKE ROAD
02ZG001	GARNISH RIVER NEAR GARNISH
02ZG004	RATTLE BROOK NEAR BOAT HARBOUR
02ZG006	OUTFLOW OF GREBES NEST POND
02ZG007	OUTFLOW OF UNNAMED POND SOUTH OF LONG POND
02ZK001	ROCKY RIVER NEAR COLINET
02ZN002	ST. SHOTTS RIVER NEAR TREPASSEY
02YK008	BOOT BROOK AT TRANS CANADA HIGHWAY
02YL003	HUMBER RIVER A HUMBER VILLAGE BRIDGE
02YL008	UPPER HUMBER RIVER ABOVE BLACK BROOK
02YM004	INDIAN BROOK DIVERSION ABOVE BIRCHY LAKE
02YO008	GREAT RATTLING BROOK ABOVE TOTE RIVER CONFLUENCE
02YO011	EXPLOITS RIVER BELOW NOEL PAULS BROOK
02YO013	EXPLOITS RIVER AT BADGER
02YO019	BADGER BROOK BELOW FOOT BRIDGE

Further details of construction and special projects can be found in a report titled “Hydrometric Infrastructure and Construction in Atlantic Canada Project Summary Report 2021 – 2022” which is attached to this report in Appendix D.

Appendix A

SCHEDULE "C" NEWFOUNDLAND AND LABRADOR 2021-2022

H -water level data
Q - flow data
M - manual gauge
R - automatic recording gauge

C - continuous record
M - miscellaneous record
S - seasonal record

Status	Station No	Station Name	Class	Stn units	fed	prov	com	Operator	Rmt	Record Q	Record H	Record R	Record C	Operating Period	Date Est'd	Drainage Area
	FEDERAL															
ACTIVE	02ZF001	BAY DU NORD RIVER AT BIG FALLS	Federal 4	1.2	1.2	0	0	WSC	1	1		1	1	Jan-Dec	1950	1170
ACTIVE	02YQ001	GANDER RIVER AT BIG CHUTE	Federal 4	1	1	0	0	WSC		1		1	1	Jan-Dec	1949	4400
ACTIVE	02YJ001	HARRYS RIVER BELOW HIGHWAY BRIDGE	Federal 4	1	1	0	0	WSC		1		1	1	Jan-Dec	1968	640
ACTIVE	02YL003	HUMBER RIVER AT HUMBER VILLAGE BRIDGE	Federal 4	1	1	0	0	WSC		1		1	1	Jan-Dec	1982	7860
ACTIVE	02ZB001	ISLE AUX MORTS RIVER BELOW HIGHWAY BRIDGE	Federal 1	1	1	0	0	WSC		1		1	1	Jan-Dec	1962	205
ACTIVE	02YG001	MAIN RIVER AT PARADISE POOL	Federal 4	1.2	1.2	0	0	WSC	1	1		1	1	Jan-Dec	1986	627
ACTIVE	02YD002	NORTHEAST BROOK NEAR RODDICKTON	Federal 4	1	1	0	0	WSC		1		1	1	Jan-Dec	1959	624
ACTIVE	02ZK001	ROCKY RIVER NEAR COLINET	Federal 1	1	1	0	0	WSC		1		1	1	Jan-Dec	1948	285
ACTIVE	02YS003	SOUTHWEST BROOK AT TERRA NOVA NATIONAL PARK	Federal 1	1	1	0	0	WSC		1		1	1	Jan-Dec	1967	36.7
ACTIVE	02YL001	UPPER HUMBER RIVER NEAR REIDVILLE	Federal 1	1	1	0	0	WSC		1		1	1	Jan-Dec	1928	2110
ACTIVE	02YC001	TORRENT RIVER AT BRISTOL'S POOL	Federal 4	1	1	0	0	WSC		1		1	1	Jan-Dec	1980	200
ACTIVE	03QC002	ALEXIS RIVER NEAR PORT HOPE SIMPSON	Federal 4	1.2	1.2	0	0	WSC	1	1		1	1	Jan-Dec	1978	2310
ACTIVE	03OE001	CHURCHILL RIVER ABOVE UPPER MUSKRAT FALLS	Federal 4	0.6	0.6	0	0	WSC	1			1	1	Jan-Dec	1948	92500
ACTIVE	03QC001	EAGLE RIVER ABOVE FALLS	Federal 4	1.2	1.2	0	0	WSC	1	1		1	1	Jan-Dec	1966	10900
ACTIVE	02XA003	LITTLE MECATINA RIVER ABOVE LAC FOURMONT	Federal 2	1.2	1.2	0	0	WSC	1	1		1	1	Jan-Dec	1979	4540
ACTIVE	03NF001	UGJOKTOK RIVER BELOW HARP LAKE	Federal 4	1.2	1.2	0	0	WSC	1	1		1	1	Jan-Dec	1979	7570
	Total Federal Newfoundland			**11.4**	**11.4**	**0.0**	**0.0**	**11.0**								
	Total Federal Labrador			**5.4**	**5.4**	**0.0**	**0.0**	**5.0**								
	Total Federal Newfoundland & Labrador			**16.8**	**16.8**	**0.0**	**0.0**	**16.0**								
	FEDERAL - PROVINCIAL															
ACTIVE	02YA002	BARTLETTS RIVER NEAR ST. ANTHONY	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1986	33.6
ACTIVE	02ZH002	COME-BY-CHANCE RIVER NEAR GOOBIES	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1961	43.3
ACTIVE	02ZE004	CONNE RIVER AT OUTLET OF CONNE POND	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1988	99.5
ACTIVE	02YO011	EXPLOITS RIVER BELOW NOEL PAULS BROOK	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1985	6300
ACTIVE	02ZG001	GARNISH RIVER NEAR GARNISH	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1958	205
ACTIVE	02ZC002	GRANDY BROOK BELOW TOP POND BROOK	Fed-Prov 3	1.20	0.60	0.60	0	WSC	1	1		1	1	Jan-Dec	1982	230
ACTIVE	02YO008	GREAT RATTLING BROOK ABOVE TOTE RIVER CONFLUENCE	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1984	823
ACTIVE	02YE001	GREAVETT BROOK ABOVE PORTLAND CREEK POND	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1983	95.7
ACTIVE	02ZA002	HIGHLANDS RIVER AT TRANS CANADA HIGHWAY	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1982	72
ACTIVE	02YR003	INDIAN BAY BROOK NEAR NORTHEAST ARM	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1981	554
ACTIVE	02YK002	LEWASSEECHJEECH BROOK AT LITTLE GRAND LAKE	Fed-Prov 3	1.20	0.60	0.60	0	WSC	1	1		1	1	Jan-Dec	1952	470
ACTIVE	02YN002	LLOYDS RIVER BELOW KING GEORGE IV LAKE	Fed-Prov 3	1.20	0.60	0.60	0	WSC	1	1		1	1	Jan-Dec	1980	469
ACTIVE	02YR001	MIDDLE BROOK NEAR GAMBO	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1959	267
ACTIVE	02ZK002	NORTHEAST RIVER NEAR PLACENTIA	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1979	89.6
ACTIVE	02YO006	PETERS RIVER NEAR BOTWOOD	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1981	177
ACTIVE	02ZH001	PIPERS HOLE RIVER AT MOTHERS BROOK	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1952	764
ACTIVE	02ZG004	RATTLE BROOK NEAR BOAT HARBOUR	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1981	42.7
ACTIVE	02YL005	RATTLER BROOK NEAR MCIVERS	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1985	17
ACTIVE	02YQ005	SALMON RIVER NEAR GLENWOOD	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1987	80.8
ACTIVE	02ZG003	SALMONIER RIVER NEAR LAMALINE	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1980	115
ACTIVE	02ZM009	SEAL COVE BROOK NEAR CAPPAHAYDEN	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1979	53.6
ACTIVE	02YK005	SHEFFIELD BROOK NEAR TRANS CANADA HIGHWAY	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1972	391
ACTIVE	02ZJ003	SHOAL HARBOUR RIVER NEAR CLARENVILLE	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1985	106
ACTIVE	02ZM016	SOUTH RIVER NEAR HOLYWOOD	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1983	17.3
ACTIVE	02ZJ001	SOUTHERN BAY RIVER NEAR SOUTHERN BAY	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1976	67.4
ACTIVE	02YO012	SOUTHWEST BROOK AT LEWISPORTE	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1989	47.7
ACTIVE	02YM003	SOUTH WEST BROOK NEAR BAIE VERTE	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1980	93.2
ACTIVE	02YS005	TERRA NOVA RIVER AT GLOVERTOWN	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1985	2000
ACTIVE	02YL008	UPPER HUMBER RIVER ABOVE BLACK BROOK	Fed-Prov 3	1.20	0.60	0.60	0	WSC	1	1		1	1	Jan-Dec	1988	471
ACTIVE	02ZM018	VIRGINIA RIVER AT PLEASANTVILLE	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1984	10.7
ACTIVE	02YS006	NORTHWEST RIVER AT TERRA NOVA NATIONAL PARK	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1994	663
ACTIVE	02ZM008	WATERFORD RIVER AT KILBRIDE	Fed-Prov 3	1.00	0.50	0.50	0	WSC		1		1	1	Jan-Dec	1974	52.7
	Total Federal - Provincial Newfoundland			**32.8**	**16.4**	**16.4**	**0.0**	**32.0**								
	Total Federal - Provincial Labrador			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**								
	Total Federal - Provincial Newfoundland & Labrador			**32.8**	**16.4**	**16.4**	**0.0**	**32.0**								

PROVINCIAL

ACTIVE	02ZL005	BIG BROOK AT LEAD COVE	Prov 1	1.00	0.00	1.00	0.00	WSC		1		1	1	Jan-Dec	1985	11.2
ACTIVE	02YK008	BOOT BROOK AT TRANS-CANADA HIGHWAY	Prov 1	1	0	1	0	WSC		1		1	1	Jan-Dec	1985	20.4
ACTIVE	02YL009	CORNER BROOK LAKE AT LAKE OUTLET	Prov 1	0.4	0	0.4	0	WSC			1	1	1	Jan-Dec	1990	
ACTIVE	02YL007	DEER LAKE NEAR GENERATING STATION	Prov 1	0.4	0	0.4	0	WSC			1	1	1	Jan-Dec	1987	
ACTIVE	02YO015	EAST POND BROOK BELOW EAST POND	Prov 1	1	0	1	0	WSC		1	1	1	1	Jan-Dec	2006	
ACTIVE	02YO014	TRIBUTARY TO GILL'S POND BROOK	Prov 1	1	0	1	0	WSC		1	1	1	1	Jan-Dec	2006	
ACTIVE	02YK010	GRAND LAKE EAST OF GRAND LAKE BROOK	Prov 1	0.6	0	0.6	0	WSC	1		1	1	1	Jan-Dec	1988	
ACTIVE	02YO013	EXPLOITS RIVER AT BADGER	Prov 1	0.4	0	0.4	0	WSC			1	1	1	Jan-Dec	2003	
ACTIVE	02YO016	EXPLOITS RIVER NEAR MILLERTOWN	Prov 1	1	0	1	0	WSC		1	1	1	1	Jan-Dec	2006	
ACTIVE	02YO018	EXPLOITS RIVER at Charlie Edwards Point	Prov1	1	0	1	0	WSC		1		1	1	Jan-Dec	2009	
ACTIVE	02YO017	Red Indian Lake at Indian Point	Prov1	0.4	0	0.4	0	WSC			1	1	1	Jan-Dec	2009	
ACTIVE	02ZC004	GRANITE LAKE AT EAST END	Prov2	0.6	0	0.6	0	WSC	1		1	1	1	Jan-Dec	2001	
ACTIVE	02ZD002	GREY RIVER NEAR GREY RIVER	Prov2	1.2	0	1.2	0	WSC	1	1		1	1	Jan-Dec	1969	1340.0
ACTIVE	02YM004	INDIAN BROOK DIVERSION ABOVE BIRCHY LAKE	Prov 1	1	0	1	0	WSC		1		1	1	Jan-Dec	1990	
ACTIVE	02ZM020	LEARYS BROOK AT PRINCE PHILIP DRIVE	Prov 1	1	0	1	0	WSC		1		1	1	Jan-Dec	1985	17.8
REMOVE	02ZK003	~~LITTLE BARACHOIS RIVER NEAR PLACENTIA~~	Prov 1	1	0	1	0	WSC		1		1	1	Jan-Dec	1983	37.2
ACTIVE	02ZK004	LITTLE SALMONIER RIVER NEAR NORTH HARBOUR	Prov 1	1	0	1	0	WSC		1		1	1	Jan-Dec	1983	104.0
ACTIVE	02ZK007	RATTLING BROOK BIG POND	Prov2	0.4	0	0.4	0	WSC			1	1	1	Jan-Dec	2006	
ACTIVE	02ZK006	RATTLING BROOK BELOW BRIDGE	Prov2	1	0	1	0	WSC		1		1	1	Jan-Dec	2006	
ACTIVE	02ZK008	Rattling Brook below Plant Discharge	Prov1	1	0	1	0	WSC		1		1	1	Jan-Dec	2009	
ACTIVE	02ZM006	NORTHEAST POND RIVER AT NORTHEAST POND	Prov 1	1	0	1	0	WSC		1		1	1	Jan-Dec	1953	3.6
ACTIVE	02ZM022	RAYMOND BROOK AT OUTLET OF BAY BULLS BIG POND	Prov 1	1	0	1	0	WSC		1		1	1	Jan-Dec	1988	
ACTIVE	02ZJ002	SALMON COVE RIVER NEAR CHAMPNEYS	Prov 1	1	0	1	0	WSC		1		1	1	Jan-Dec	1983	73.6
ACTIVE	02ZL004	SHEARSTOWN BROOK AT SHEARSTOWN	Prov 1	1	0	1	0	WSC		1		1	1	Jan-Dec	1983	28.9
ACTIVE	02YL004	SOUTH BROOK AT PASADENA	Prov 1	1	0	1	0	WSC		1		1	1	Jan-Dec	1983	58.5
ACTIVE	02YL012	Steady Book above Confluence of Humber river	Prov 1	1	0	1	0	WSC		1		1	1	Jan-Dec	2014	58.5
ACTIVE	02ZN002	ST. SHOTTS RIVER NEAR TREPASSEY	Prov 1	1	0	1	0	WSC		1		1	1	Jan-Dec	1985	15.5
ACTIVE	02YN004	STAR BROOK ABOVE STAR LAKE	Prov	1.2	0	1.2	0	WSC	1	1		1	1	Jan-Dec	2000	276.0
ACTIVE	02YR004	TRITON BROOK ABOVE GAMBO POND	Prov 1	1	0	1	0	WSC		1		1	1	Jan-Dec	2002	
ACTIVE	02YN005	VICTORIA LAKE AT NORTHEAST CONTROL STRUCTURE	Prov2	0.6	0	0.6	0	WSC	1		1	1	1	Jan-Dec	2003	
ACTIVE	02ZD003	R.R. POND NEAR GRANITE LAKE	Prov2	0.6	0	0.6	0	WSC	1		1	1	1	Jan-Dec	2003	
ACTIVE	02YF002	CAT ARM RESERVOIR NEAR SPILLWAY	Prov2	0.6	0	0.6	0	WSC	1		1	1	1	Jan-Dec	1994	
ACTIVE	02ZC003	WHITE BEAR RIVER ABOVE BIG INDIAN BROOK	Prov2	0.9	0	0.9	0	WSC	1	1		1	1	Seasonal	1996	
ACTIVE	02ZG006	OUTFLOW OF GREBES NEST POND	Prov2	1.0	0	1.0	0	WSC		1	1	1	1	Jan-Dec	2016	
ACTIVE	02YO019	Badger Brook Below Foot Bridge	Prov	0.5	0	0.5	0	WSC		1	1	1	1	Jan-Dec	2017	
ACTIVE	02ZG007	OUTFLOW OF UNNAMED POND SOUTH OF LONG POND	Prov2	1.0	0	1.0	0	WSC		1	1	1	1	Jan-Dec	2016	
ACTIVE	03OC003	ATIKONAK RIVER ABOVE PANCHIA LAKE	Prov2	1.2	0	1.2	0	WSC	1	1		1	1	Jan-Dec	1972	15100.0
ACTIVE	03NE003	CAMP POND AT SOUTHWEST END	Prov	0.6	0	0.6	0	WSC	1		1	1	1	Jan-Dec	2002	
ACTIVE	03NE002	CAMP POND BROOK BELOW CAMP POND	Prov	1.2	0	1.2	0	WSC	1	1		1	1	Jan-Dec	2002	
ACTIVE	03OA012	Luce Brook below Tinto Pond	Prov	1.2	0	1.2	0	WSC	1	1	1	1	1	Jan-Dec	2006	
ACTIVE	03OA014	Wabush Lake at Dolamite Rd	Prov	1.2	0	1.2	0	WSC	1	1	1	1	1	Jan-Dec	2006	
ACTIVE	03OA005	Wabush Lake at Lake Outlet	Prov	1.2	0	1.2	0	WSC	1	1		1	1	Jan-Dec	1978	4480.0
ACTIVE	03OE011	PINUS RIVER	Prov	1.2	0	1.2	0	WSC	1	1		1	1	Jan-Dec	1998	772.0
ACTIVE	03NE011	REID BROOK Below Tributary	Prov	1.2	0	1.2	0	WSC	1	1		1	1	Jan-Dec	2003	
ACTIVE	03NE001	REID BROOK AT OUTLET OF REID POND	Prov	1.2	0	1.2	0	WSC	1	1		1	1	Jan-Dec	2002	
ACTIVE	03NE012	TRIBUTARY to Reid Brook	Prov	1.2	0	1.2	0	WSC	1	1		1	1	Jan-Dec	2003	
ACTIVE	03OE013	CHURCHILL RIVER ABOVE GRIZZLE RAPIDS	Prov	0.6	0	0.6	0	WSC	1		1	1	1	Jan-Dec	2008	
ACTIVE	03OE014	CHURCHILL RIVER 6.15KMS BELOW MUSKRAT FALLS	Prov	0.6	0	0.6	0	WSC	1		1	1	1	Jan-Dec	2008	
REMOVE	03PD001	~~Lake Melville East of Little River~~	Prov1	0.6	0	0.6	0	WSC	1		1	1	1	Jan-Dec	2010	
ACTIVE	03PC001	Churchill River at English Point	Prov1	0.6	0	0.6	0	WSC	1		1	1	1	Jan-Dec	2010	
ACTIVE	03OB007	Elross Creek below Pinette Lake Inflow	Prov2	1.2	0	1.2	0	WSC	1	1		1	1	Jan-Dec	2011	
ACTIVE	03OA015	Flora Creek below Trans Labrador Highway	Prov2	1.2	0	1.2	0	WSC	1	1		1	1	Jan-Dec	2012	
ACTIVE	03OB009	Joan Brook below outlet of Joan Lake	Prov	1.2	0	1.2	0	WSC		1	1	1	1	Jan-Dec	2016	
ACTIVE	03OA016	Dumbell stream above Dumbell Lake	Prov	1.2	0	1.2	0	WSC		1	1	1	1	Jan-Dec	2016	
ACTIVE	03OD008	Churchill River Above Churchill Falls Tailrace	Prov	0.6	0	0.6	0	WSC		1	1	1	1	Jan-Dec	2017	
ACTIVE	03OD009	Churchill River below Metchin River	Prov	0.6	0	0.6	0	WSC		1	1	1	1	Jan-Dec	2017	
ACTIVE	03OD010	Churchill River Below Churchill Falls Tailrace	Prov	0.6	0	0.6	0	WSC		1	1	1	1	Jan-Dec	2017	
ACTIVE	03OE017	Mud Lake at outlet tributary at Mud Lake	Prov	0.6	0	0.6	0	WSC			1	1	1	Jan-Dec	2017	
ACTIVE	03OA017	Pumphouse Stream above Drum Lake	Prov	1.2	0	1.2	0	WSC		1	1	1	1	Jan-Dec	2017	
ACTIVE	03OE019	Churchill River Below Outlet of Traverspine River	Prov	0.6	0	0.6	0	WSC			1	1		Jan-Dec	2018	
ACTIVE	03OE018	Churchill River at End of Mud Lake Road	Prov	0.6	0	0.6	0	WSC			1	1	1	Jan-Dec	2018	
ACTIVE	03PB002	Goose Bay at Rabbit Island	Prov	0.6	0	0.6	0	WSC			1	1	1	Jan-Dec	2018	
ACTIVE	03OE016	Churchill River at Happy Valley	Prov	0.6	0	0.6	0	WSC			1	1	1	Jan-Dec	2018	
ACTIVE	03OB006	Goodream Creek above Triangle Lake	Prov	0.4	0	0.4	0	WSC			1	1	1	Jan-Dec	2018	
ACTIVE	TBD	Goose River at Bridge	Contributed	0	0	0	0	WRMD			1	1	1	Jan-Dec	2018	

Total Provincial Newfoundland	**29.8**	**0.0**	**29.8**	**0.0**	**36.0**
Total Provincial Labrador	**24.4**	**0.0**	**24.4**	**0.0**	**29.0**
Total Provincial Newfoundland & Labrador	**54.2**	**0.0**	**54.2**	**0.0**	**65.0**
Grand Total Newfoundland	**74.0**	**27.8**	**46.2**	**0.0**	**79.0**

Grand Total Labrador							**29.8**	**5.4**	**24.4**	**0.0**	**34.0**								
Grand Total Newfoundland and Labrador							**103.8**	**33.2**	**70.6**	**0.0**	**113.0**								
ASHKUI WATER QUALITY SAMPLING SITES																			
ACTIVE		CAPE CARIBOU RIVER					0.10	0	0.10	0	WSC								
ACTIVE		Dominion Lake					0.10	0	0.10	0	WSC								
ACTIVE		Seal Lake Narrows					0.10	0	0.10	0	WSC								
ACTIVE		Susan River					0.10	0	0.10	0	WSC								
ACTIVE		Wuchusk lake					0.10	0	0.10	0	WSC								
ACTIVE		NASKAUPI RIVER BELOW NASKAUPI LAKE					0.10	0	0.10	0	WSC								
	Total Water Quality Sampling Sites Labrador						**0.60**	**0.00**	**0.60**	**0.00**	**6.00**								

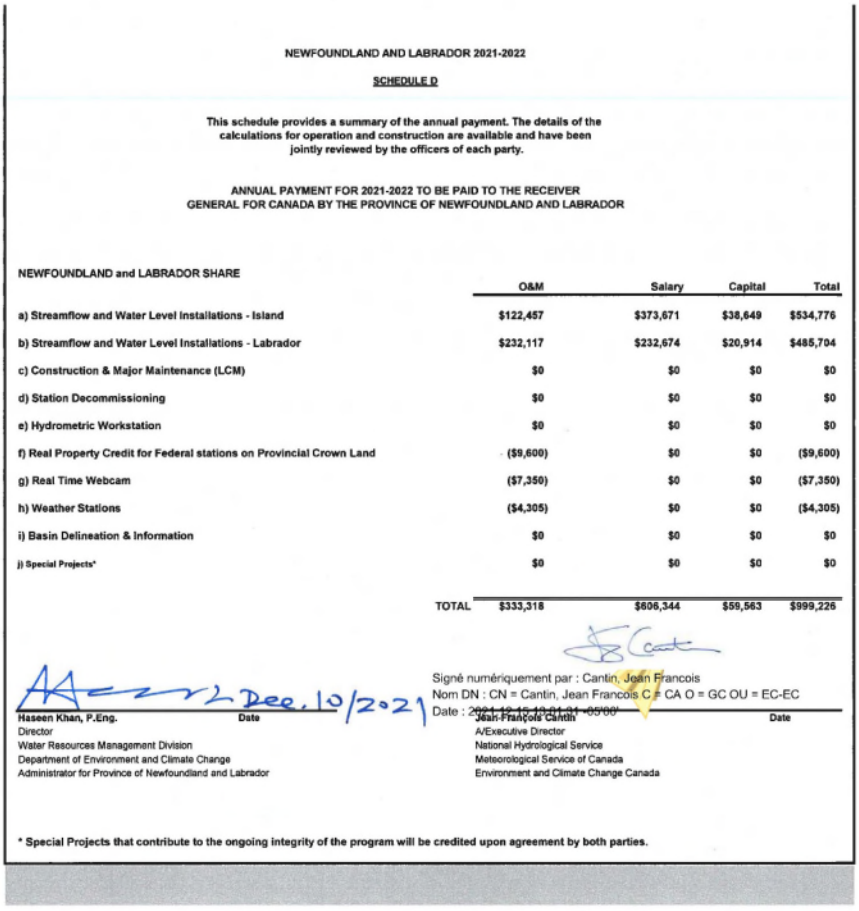
Dec. 10/2021

Haseen Khan, P.Eng. **Date**
Director
Water Resources Management Division
Department of Environment and Climate Change
Administrator for Province of Newfoundland and Labrador

Jean-François Cantin **Date**
A/Executive Director
National Hydrological Service
Meteorological Service of Canada
Environment and Climate Change Canada

Signé numériquement par : Cantin, Jean Francois
Nom DN : CN = Cantin, Jean Francois C = CA O = GC OU = EC-EC
Date : 2021.12.15 13:04:29 -05'00'

Appendix B SIGNED SCHEDULE D 2021-2022



NEWFOUNDLAND AND LABRADOR 2021-2022

SCHEDULE D

This schedule provides a summary of the annual payment. The details of the calculations for operation and construction are available and have been jointly reviewed by the officers of each party.

ANNUAL PAYMENT FOR 2021-2022 TO BE PAID TO THE RECEIVER GENERAL FOR CANADA BY THE PROVINCE OF NEWFOUNDLAND AND LABRADOR

NEWFOUNDLAND and LABRADOR SHARE

	O&M	Salary	Capital	Total
a) Streamflow and Water Level Installations - Island	$122,457	$373,671	$38,649	$534,776
b) Streamflow and Water Level Installations - Labrador	$232,117	$232,674	$20,914	$485,704
c) Construction & Major Maintenance (LCM)	$0	$0	$0	$0
d) Station Decommissioning	$0	$0	$0	$0
e) Hydrometric Workstation	$0	$0	$0	$0
f) Real Property Credit for Federal stations on Provincial Crown Land	($9,600)	$0	$0	($9,600)
g) Real Time Webcam	($7,350)	$0	$0	($7,350)
h) Weather Stations	($4,305)	$0	$0	($4,305)
i) Basin Delineation & Information	$0	$0	$0	$0
j) Special Projects*	$0	$0	$0	$0
TOTAL	$333,318	$606,344	$59,563	$999,226

Dec. 10/2021

Signé numériquement par : Cantin, Jean Francois
Nom DN : CN = Cantin, Jean Francois C = CA O = GC OU = EC-EC
Date : 2021.12.13 13:01:31 -05'00'

Haseen Khan, P.Eng. Date
Director
Water Resources Management Division
Department of Environment and Climate Change
Administrator for Province of Newfoundland and Labrador

Jean-François Cantin Date
A/Executive Director
National Hydrological Service
Meteorological Service of Canada
Environment and Climate Change Canada

* Special Projects that contribute to the ongoing integrity of the program will be credited upon agreement by both parties.

Appendix C Summary of Cumulative Annual Costs 1975-76 to 2021-2022

SUMMARY OF ACTUAL ANNUAL COSTS AND PAYMENTS
1975-76 TO 2021- 2022

	SCHEDULE "D" PAYMENTS BY PROVINCE OF NEWFOUNDLAND								ACTUAL PROVINCIAL SHARE				PROVINCIAL +CREDIT	
YEAR	Hydrometric Op.	Humber River Met Station	Inkind Equipment Purchased by NL	In kind Equipment Credit	Sediment	Construction	Total	Hydromet	Sediment	Construction	Total	Debit	Curent Balance
1975-76	$ 37,800				$ -	$ 3,600	$ 41,400	$ 36,238	$ -	$ 2,177	$ 38,415	$ 2,985	$ 2,985.00
1976-77	$ 32,340				$ -	$ 12,000	$ 44,340	$ 37,840	$ -	$ 1,573	$ 39,413	$ 4,927	$ 7,912.00
1977-78	$ 35,520				$ -	$ 24,480	$ 60,000	$ 38,700	$ -	$ 13,963	$ 52,663	$ 7,337	$ 15,249.00
1978-79	$ 56,775				$ 1,400	$ 11,825	$ 70,000	$ 51,371	$ 679	$ 26,000	$ 78,050	-$ 8,050	$ 7,199.00
1979-80	$ 68,338				$ 933	$ 25,729	$ 95,000	$ 62,256	$ 896	$ 22,476	$ 85,628	$ 9,372	$ 16,571.00
1980-81	$ 78,639				$ 1,475	$ 6,000	$ 86,114	$ 83,518	$ 1,064	$ 7,703	$ 92,285	-$ 6,171	$ 10,400.00
1981-82	$ 83,523				$ 3,750	$ 14,000	$ 101,273	$ 100,726	$ 3,114	$ 16,560	$ 120,400	-$ 19,127	-$ 8,727.00
1982-83	$ 96,542				$ 3,744	$ 55,000	$ 155,286	$ 102,735	$ 5,886	$ 47,224	$ 155,845	-$ 559	-$ 9,286.00
1983-84	$ 141,457				$ 4,470	$ 38,000	$ 183,927	$ 136,917	$ 6,906	$ 37,864	$ 181,687	$ 2,240	-$ 7,046.00
1984-85	$ 168,244				$ 7,350	$ 52,000	$ 227,594	$ 168,247	$ 5,295	$ 48,662	$ 222,204	$ 5,390	-$ 1,656.00
1985-86	$ 195,563				$ 7,650	$ 36,787	$ 240,000	$ 191,580	$ 6,324	$ 39,203	$ 237,107	$ 2,893	$ 1,237.00
1986-87	$ 211,706				$ 6,975	$ 34,641	$ 253,322	$ 222,843	$ 4,413	$ 35,136	$ 262,392	-$ 9,070	-$ 7,833.00
1987-88	$ 213,634				$ 6,975	$ 42,000	$ 262,609	$ 220,934	$ 3,597	$ 47,957	$ 272,488	-$ 9,879	-$ 17,712.00
1988-89	$ 245,221				$ 6,300	$ 15,000	$ 266,521	$ 237,249	$ 4,683	$ 16,148	$ 258,080	$ 8,441	-$ 9,271.00
1989-90	$ 253,392				$ 5,173	$ 30,000	$ 288,565	$ 274,004	$ 5,571	$ 21,264	$ 300,839	-$ 12,274	-$ 21,545.00
1990-91	$ 260,691				$ 5,925	$ -	$ 266,616	$ 266,058	$ 4,809	$ 2,532	$ 273,399	-$ 6,783	-$ 28,328.00
1991-92	$ 264,591				$ 6,450	$ -	$ 271,041	$ 234,222	$ 5,649	$ -	$ 239,871	$ 31,170	$ 2,842.00
1992-93	$ 276,655	-$ 3,173			$ 3,825	$ -	$ 277,307	$ 254,430	$ 4,713	$ -	$ 259,143	$ 18,164	$ 21,006.00
1993-94	$ 274,156	-$ 3,173			$ 3,700	$ 21,000	$ 295,683	$ 276,163	$ 3,505	$ 20,496	$ 300,164	-$ 4,481	$ 16,525.00
1994-95	$ 303,700	-$ 8,200			$ 3,200	$ -	$ 298,700	$ 288,835	$ 3,220	$ -	$ 292,055	$ 6,645	$ 23,170.00
1995-96	$ 310,272	-$ 16,232			$ 1,375	$ -	$ 295,415	$ 292,860	$ 1,180	$ -	$ 294,040	$ 1,375	$ 24,545.00
1996-97	$ 236,427	-$ 6,784			$ -	$ -	$ 229,643	$ 229,643	$ -	$ -	$ 229,643	$ -	$ 24,545.00
1997-98	$ 172,334	-$ 5,165			$ -	$ -	$ 167,169	$ 175,042			$ 175,042	-$ 7,873	$ 16,672.00
1998-99	$ 151,439	-$ 4,808			$ -	$ -	$ 146,631	$ 154,159	$ -	$ -	$ 154,159	-$ 7,528	$ 9,144.24
1998-99		Adjustment credit to modernization				$ -		$ -	$ -	$ -		-$ 24,677	-$ 15,532.76
1999-00	$ 147,934	-$ 4,686			$ -	$ -	$ 143,248	$ 152,829	$ -	$ -	$ 152,829	-$ 9,581	-$ 25,113.89
2000-01	$ 165,270	-$ 5,231			$ -	$ -	$ 160,039	$ 158,561	$ -	$ -	$ 158,561	$1,477.67	-$ 23,636.22
2001-02	$ 166,997	-$ 5,119			$ -	$ -	$ 161,878	$ 158,634	$ -	$ -	$ 158,634	$3,244.05	-$ 20,392.17
2002-03	$ 172,639	-$ 5,369			$ -	$ -	$ 167,270	$ 169,865	$ -	$ -	$ 169,865	-$2,595.38	-$ 22,987.55
2003-04	$ 178,699	-$ 4,924			$ -	$ -	$ 173,775	$ 175,735	$ -	$ -	$ 175,735	-$1,960.00	-$ 24,947.55
2004-05	$ 420,834	-$ 5,395			$ -	$ -	$ 415,439	$ 407,849	$ -	$ -	$ 407,849	$7,590.00	-$ 17,357.55
2005-06	$ 425,082	-$ 5,395	$ 5,077	$ 1,523	$ -	$ -	$ 421,210	$ 393,104	$ -	$ -	$ 393,104	$28,105.88	$ 10,748.33
2006-07	$ 477,365	-$ 5,395	$ 20,400	$ 6,120	$ -	$ 1,500	$ 479,590	$ 445,337	$ -	$ 1,144	$ 446,481	$33,108.73	$ 43,857.06
2007-08	$ 548,813	-$ 6,697	$ 67,600	$ 20,280	$ -	$ 1,368	$ 563,764	$ 537,469	$ -	$ 3,663	$ 541,131	$22,632.70	$ 66,489.75
2008-09	$ 605,612	-$ 8,258	$ 56,400	$ 16,900	$ -	$ 14,404	$ 628,658	$ 622,512	$ -	$ 8,998	$ 631,510	-$2,852.00	$ 63,637.75
2009-10	$ 647,777	-$ 8,125	$ 11,000	$ 3,300	$ -	$ 20,500	$ 663,452	$ 669,641	$ -	$ 21,068	$ 690,709	-$27,257.00	$ 36,380.75
2010-11	$ 677,540	-$ 8,110	$ 35,663	$ 10,699	$ -	$ 15,000	$ 695,129	$ 692,904	$ -	$ 34,502	$ 727,406	-$32,277.00	$ 4,103.75
2011-12	$ 694,839	$ 9,291	$ 57,837	$ 17,351			$ 721,481	$ 826,078			$ 826,078	-$104,597.00	-$ 100,493.25
2012-13	$ 806,826	-$ 9,983	$ 18,040	$ 5,412			$ 802,255	$ 804,546			$ 804,546	-$2,291.00	-$ 102,784.25
2013-14	$ 832,689	-$ 9,983	$ 16,821	$ 5,046			$ 827,752	$ 806,657			$ 806,657	$21,095.30	-$ 81,688.95
2014-15	$ 861,167	-$ 10,133	$ 44,046	$ 13,214			$ 864,248	$ 806,396			$ 806,396	$57,851.80	-$ 23,837.15
2015-16	$ 803,974	-$ 10,133	$ 3,343	$ 1,003			$ 794,844	$ 785,933			$ 785,933	$8,911.00	-$ 14,926.15
2016-17	$ 750,644	-$ 10,133	$ 15,551	$ 4,665			$ 745,176	$ 817,843			$ 817,843	-$72,666.70	-$ 87,592.84
2017-18	$ 987,293	-$ 10,133	$ 9,255	$ 2,777			$ 979,937	$ 929,538			$ 929,538	$50,398.50	-$ 37,194.34
2018-19	$ 981,142		$ 18,594	$ 5,578			$ 986,720	$ 988,310			$ 988,310	-$1,589.80	-$ 38,784.15
2019-20	$ 977,768		$ 20,437	$ 6,131			$ 983,899	$ 1,001,763			$ 1,001,763	-$17,863.90	-$ 56,648.05
2020-21	$ 975,240		$ 39,509	$ 11,853			$ 987,093	$ 934,810			$ 934,810	$52,282.70	-$ 4,365.35
2020-22	$ 999,226		$ 43,554	$ 13,066			$ 1,012,292	$ 1,040,083			$ 1,040,083	-$27,791.00	-$ 32,156.35
											Net total		-$ 32,156.35
NOTES.	A positive net total indicates funds owed to the Province.												

Appendix D Hydrometric Infrastructure and Construction in Atlantic Canada Project Summary Report

1. Introduction

This report provides a summary of the infrastructure and construction projects that were initiated and/or completed in Atlantic Canada in 2021 – 2022. In addition, outstanding project tasks are outlined herein. Projects were selected based on their alignment with priorities for Treasury Board infrastructure renewal spending. Where possible, an approach was taken to renew stations that have multiple Treasury Board eligible issues. Efforts were made to group similar projects together to reduce overall project costs. These Treasury Board priorities include the following:

- Decommission inactive cableways;
- Retrofit cableways where they are still needed;
- Assess and remediate/risk assess environmental liabilities (e.g., creosote, total petroleum hydrocarbons (PHC), mercury, lead);
- Replace/repair shelters that are in unsafe/unusable condition; and
- Decommission inactive wells with shelters in poor condition.

This past fiscal (2021 – 2022) was year four of five years of committed funds for the Treasury Board infrastructure renewal program.

1.1. Environmental Liabilities

Federal funding for contaminated sites may be leveraged for our stations through the Federal Contaminated Site Action Program (FCSAP). National Contaminated Sites Classification System (NCSCS) scoring is required for each candidate station to be able to access this funding. This funding may be used beyond the planning horizon of the Treasury Board renewal funds to help tackle outstanding environmental contamination on the longer term

2. New Brunswick

2.1. Overall Strategy

The strategy for infrastructure and construction renewal in New Brunswick includes replacement of poor shelters over inactive stilling wells or that pose OHS concerns, decommissioning of inactive cableways or retrofit to bank operated when needed, and addressing of potential environmental liabilities that are outstanding. Overall, efforts are made to prioritize projects that have multiple issues at the sites and group similar work together for cost saving purposes.

During this past fiscal, priority was to replace shelters that were in poor condition over wells that required decommissioning. The priority was on this because the shelter floors were in questionable condition and could pose a fall hazard for ECCC personnel. Another priority was to begin to address the shelters that are located in the floodplain of the Saint John River (SJR) that were subject to severe flooding in 2018 and 2019, and that have Occupational Health and Safety (OHS) and environmental issues.

A priority for New Brunswick is to decommission inactive cableways and retrofit those that are still required to bank-operated cableways (BOC). As of 2021 there were 8 locked out cableways in New Brunswick for use even for BOC operations due to not meeting the National safety standards. In many cases, the cableways require collection of additional information before determining a path forward for high water discharge measurements. There is one operational BOC located at 01AK001 Shogomoc Stream near Trans Canada.

Lastly, an important priority for New Brunswick is to characterize the environmental liabilities associated with our historical use of the stations. This includes re-visiting potential mercury-contaminated stations where other work is to be conducted at the station. Specifically, this work targets end-of life of the shelters, and addresses remaining potential mercury impacts under the

shelters. This past year the potential for minor PHC contamination in some of the stilling wells was encountered. This was legacy contamination from PHC products used historically as an anti-freeze agent in the wells. In addition, there is some potential for lead paint use on older style shelters.

2.2. 01BQ001 Northwest Miramichi River at Trout Brook (FP)

Figure 1 shows the former cableway at 01BQ001 Northwest Miramichi River at Trout Brook that was in poor condition and was no longer required. Therefore, the cableway was decommissioned on August 26, 2021 (Figure 2).

Figure 1. Left bank of former cableway at 01BQ001 Northwest Miramichi River at Trout Brook (Photograph taken on July 4, 2016).

Figure 2. Post construction site at 01BQ001 Northwest Miramichi River at Trout Brook (Photograph August 26, 2021).

2.3. 01BP002 Catamaran Brook at Repap Road Bridge (F)

The stilling well at 01BP002 Catamaran Brook at Repap Road Bridge was in poor condition and posed an OHS risk (Figure 3). The well was no longer required as it had been converted to a pressure water level system (Figure 4), therefore, the well was decommissioned October 19, 2021. During the site reconnaissance visit in July the presence of an unidentified hydrocarbon product present as free phase in the well was encountered.

Environmental consultants retained through Public Services and Procurement Canada (PSPC) conducted a preliminary environmental assessment of the PHC contamination. This work was conducted with a batch of seven other stilling wells in the Maritimes.

Figure 3. Gauge house and stilling well at 01BP002 Catamaran Brook at Repap Road Bridge (Photograph taken June 6, 2020).

Figure 4. New tilting mast and cabinet at 01BP002 Catamaran Brook at Repap Road Bridge (Photograph taken December 7, 2020).

2.3.1. Environmental Assessment, Decommissioning, and Remediation

Environmental consultants were retained through PSPC as a result of encountering potential TPH contamination to conduct a preliminary environmental site assessment (Figure 5). This work was conducted with a batch of seven other stilling wells in the Maritimes. The results from this testing indicated the presence of free product in the frost tube which exceeded the applicable guidelines for the Maritimes. Other samples included groundwater, soil, and sediment which were all within the acceptable limits of the applicable guidelines.

The decommissioning of the well was done in accordance with the recommendations from the report provided from the environmental assessments conducted through the PSPC. Figure 6 shows the well filled in after the water and sediment had been pumped out to be properly disposed. The site of the old well was restored using top soil and seeded to encourage new growth (Figure 7). It should be noted that there is no need for any further work at this site.

Figure 5. Well water in the stilling well at 01BP002 showing free phase layer (photograph taken July 9, 2020).

Figure 6. Well filled in with layers of sand and bentonite at 01BP002 (photograph taken October 19, 2021).

Figure 7. View looking at the site post-decommissioning and soil remediation (photograph taken October 19, 2021).

2.4. 01BS001 Coal Branch River at Beersville (FP)

Figure 8 shows the former stilling well and gauge house at 01BS001 Coal Branch River at Beersville. This gauge house was in poor condition, which posed an OHS risk to ECCC personnel servicing the station. Similar to Catamaran Brook, historical review of the station indicated that there was potential for PHC contamination. Therefore, additional information was required to be collected prior to decommissioning this well. This well was also included in the preliminary environmental assessment conducted by environmental consultants hired by PSPC.

In the interim in 2020, a new aluminum tilting mast was installed on the far bank of the river (right bank), near the guardrail to the bridge, and in the right of way of the road as shown in Figure 9. This was installed onto a single three-inch diameter screw pile. The hydrometric monitoring equipment has been moved and installed into the new shelter.

Figure 8. Gauge house and stilling well at 01BS001 Coal Branch River at Beersville (photograph taken on November 15, 2019).

Figure 9. New tilting mast and enclosure at 01BS001 Coal Branch at Beersville (photograph taken November 18, 2020).

2.4.1. Environmental Assessment, Decommissioning, and Remediation

The final report for the preliminary environmental assessment that was conducted by environmental consultants hired by PSPC has been received. The findings indicate that there was PHC impacts that exceeded provincial guidelines in the well bottom sediment and within the well water of the frost tube. Two soil samples were taken from the installation of a shallow monitoring well between the stilling well and river edge (Figure 10 and 11). Both soil samples reported concentrations for petroleum hydrocarbons below the applicable guidelines. Remediation of the groundwater and well sediment was recommended prior to the decommissioning of the well for this site.
This recommendation was followed in the decommissioning of this well. Figure 12 shows the well being pumped which was conducted July 22, 2021. The well was then cleaned on August 25, 2021. Finally, Figures 13 and 14 show the decommissioning and remediation of the well which was conducted October 20, 2021. It should be noted that there is no need for any further work at this site.

Figure 10. View of power auger used to install monitoring well (MW1) on January 20, 2021 (Photograph from GHD, 2021a).

Figure 11. View of monitoring well MW1 facing east on January 20, 2021 (Photograph from GHD, 2021a).

Figure 12. View of well water and sediment being pumped out (photograph taken July 22, 2021).

Figure 13. Shelter and well casing being removed from the site (photograph taken October 20, 2021).

Figure 14. View of the remediated area where the former shelter was located (photograph taken October 20, 2021).

2.5. 01BO001 Southwest Miramichi River at Blackville (F)

Figure 15 shows the former stilling well and shelter located at 01BO001 Southwest Miramichi River at Blackville. The shelter was in poor condition and posed an OHS concern. Therefore, this well was decommissioned January 12, 2022. This well was suspected of potential environmental contamination for PHC based on historical review. In addition, there was potential for mercury to remain at this station around the shelter. As a result of this potential contamination, a preliminary environmental assessment was conducted in conjunction with the seven other wells across the Maritimes, which was conducted by environmental consultants managed through PSPC.

Figure 15. Gauge house and stilling well at 01BO001 Southwest Miramichi River at Blackville (Photograph taken July 23, 2019).

2.5.1. Environmental Assessment, Decommissioning, and Remediation

A preliminary environmental assessment was conducted at this station to assess the potential for mercury, PHCs, and lead paint contamination. Water samples were collected and analyzed for PHC from the stilling well water and from a hand extended shallow monitoring well downgradient of the stilling well (Figure 16). There was a slight exceedance of surface water guidelines in the monitoring well and re-sampling was recommended to confirm. Soil samples were collected from surrounding soils and analyzed for PHC and were below guideline values. One sediment sample was collected from the bottom of the well and was within the guideline values for total petroleum hydrocarbons (TPH). Nine samples were collected and analyzed for mercury with two exceedances of residential/parkland guideline values. Further mercury sampling was recommended to delineate the contamination. Lead concentrations that exceeded provincial guidelines was detected in the shelter paint and therefore precautions were recommended for shelter demolition and disposal. The NCSCS score was obtained for this site.

The former stilling well was decommissioned January 12, 2022 in accordance with the recommendation in the report from the environmental assessment facilitated through a contract with PSPC. This included taking caution when handling the lead-based painted materials and having them disposed of at an approved facility. One soil sample returned with a mercury exceedance according to applicable guidelines. This soil was (estimated 0.54 m^3) was removed and placed in approved containers to disposed of at a licenced facility (Figure 17). Figures 18 and 19 show the decommissioning and remediation of the former well site.

Figure 16. Installation of the shallow monitoring well at 01BO001 by GHD. Photograph taken January 18, 2021 (GHD, 2021b).

Figure 17. View of mercury contaminated soil from soil remediation (photograph taken January 12, 2022).

Figure 18. View of the removal of the station well top at 01BO001. Photograph taken January 12, 2022 (GHD, 2022).

Figure 19. View of well and remedial area grading with rock. Photograph taken January 12, 2022 (GHD, 2022a).

2.5.2. Outstanding Work

It should be noted that site closure reporting still needs to obtained here from the Contaminated Sites division of the NB Department of Environment and Local Government and this is planned for FY 2022 – 23.

2.6. 01BTG02 Point de Bute Groundwater (PGW)

Figures 20 shows the shelter at 01BTG02 Point de Bute Groundwater prior to shelter improvements. This station is located in a cow pasture and the cows would often rub against the shelter which caused the shelter to tilt. This identified the need to fix the shelter and build a fence around the structure to prevent future tilting. A barbed wire fence with an access gate was constructed and installed November 18, 2021 (Figure 21).

Figure 20. View of tilting shelter at 01BTG02 prior to improvements (photograph taken August 6, 2021).

Figure 21. View of shelter after it levelled off and the installation of the fence (photograph taken November 18, 2021).

2.7. 01AK001 Shogomoc Stream near Trans Canada (FP)

The BOC has been updated with a Barossa Double drum unit in 2018 to facilitate conventional discharge measurements (Figure 22). The BOC was partially renovated in November 2020; however, additional renovations were needed to bring the BOC to operational standards. The additional renovations were conducted by an internal team from ECCC in November 2021. The renovations included the addition of ready-mix concrete bags to the right bank concrete mass anchor (Figures 23 and 24). Additional concrete was mixed on site and added to the right bank anchor in Nov. 2021. A total of 52 bags (66 lbs/30 kg/bag) were added to the anchor for a total weight of 1,560 kg addition. The final total weight of the anchor on RB is estimated at 6,500 kg (existing concrete + steel plates + additional concrete).The hardware and cable on the backstays for both banks were replaced (Figure 25). New aircraft warning markers were installed. A new load limiting leash was designed for the site to allow for a safer measurement. This BOC is now upgraded and operational and training of operations staff is anticipated for December 2022.

Figure 22. Barossa double drum winch bank-operated cableway at 01AK001 Shogomoc Stream near Trans Canada (Photograph November 4, 2021).

Figure 23. Constructing concrete formwork to upgrade the right bank mass anchor at 01AK001 Shogomoc Stream near Trans Canada (Photograph November 3, 2021).

Figure 24. Concrete and steel weight additions to the right bank concrete mass anchor at 01AK001 Shogomoc Stream near Trans Canada (Photograph November 5, 2021).

Figure 25. New hardware on the cableway backstays on the right bank at 01AK001 Shogomoc Stream near Trans Canada (Photograph November 5, 2021).

2.8. 01BV006 Pointe Wolfe River at Fundy National Park (F)

Figure 27 shows the stilling well, which is inactive at this site has been updated to the pressure system. This well is fully exposed with the top bent inward and welded shut. Figure 28 shows the shelter used to house the equipment for the pressure system. The stilling well and cableway at this location will eventually require decommissioning (Figure 29).

Figure 26. View of stilling well at 01BV006 with access hole cut for sampling purposes (photograph taken November 27, 2021).

Figure 27. Shelter containing the equipment for the pressure system. Photograph taken mid-November, 2021 (GHD, 2022d).

Figure 28. View of creosote-treated cableway timbers on the right bank of the river. Photograph taken mid-November, 2021 (GHD, 2022d).

2.8.1. Preliminary Environmental Assessment

A preliminary environmental assessment was conducted at this station to assess the potential for mercury, PHCs, and lead paint contamination. Surface soil samples from near the shelter determined lead and mercury contamination above applicable guidelines. A surface soil sample collected near the cableway resulted in concentrations of PAHs above the applicable guidelines for Environmental Health. Samples of wood from the cableway also showed exceedances in PAHs and hydrocarbons. A water sample taken from the stilling well indicated exceedance levels of hydrocarbons. The NCSCS

score was obtained for this site of 42.5 and it is low priority for action for Federal Contaminated Sites Action Plan (FCSAP) funding for contamination remediation.

2.8.2. Outstanding Work

The stilling well and cableway still require decommissioning and environmental remediation for PHC and mercury.

3. Nova Scotia and Prince Edward Island

3.1. Overall Strategy

The overall strategy for infrastructure and construction in Nova Scotia and Prince Edward Island (PEI) is to prioritize work at sites with multiple issues. The priority for renewal funds spending includes the following: decommissioning inactive cableways or retrofitting where required, assessing and remediation of environmental liabilities, and decommissioning inactive stilling wells with poor condition shelters.

A priority for Nova Scotia and PEI is to characterize historical environmental liabilities and remediate or risk assess them where needed. This includes re-visiting potentially mercury-contaminated stations where other work is to be conducted at the station. Specifically, this work targets end-of life of the shelters and addressing remaining potential mercury impacts under the shelters. This past year the potential for minor PHC contamination in some of the stilling wells was encountered. This was legacy contamination from PHC products used historically as an anti-freeze agent in the wells.

3.2. 01EE001 Medway River at Charleston (FP)

Figure 30 shows the former station at 01EE001 Medway River at Charleston. This shelter required dismantling and the well decommissioning, both of which were completed September 24, 2021. During the site reconnaissance visit on July 21, 2020, a water sample was collected from the water inside the concrete well and analyzed for TPH. The results indicated a resemblance of petroleum products and therefore further work was required to be conducted on this site for an environmental assessment prior to station decommissioning.

Figure 29. The stilling well and walk-in gauge house at the inactive station 01EE001 Medway River at Charleston (Photograph taken on July 21, 2020).

3.2.1. Environmental Assessment, Decommissioning, and Remediation

Environmental consultants were retained through PSPC as a result of encountering potential TPH contamination to conduct a preliminary environmental site assessment. This work was conducted with a batch of seven other stilling wells in the Maritimes. The results from the environmental assessment showed that the paint on the trim of the exterior of the shelter contained extractable lead and lead leachate concentrations exceeding applicable guidelines. Sediment samples from the bottom of the well also exceeded applicable guidelines for petroleum hydrocarbons. Other samples including water from the well and soil from a groundwater monitoring well did not exceed any concentrations of applicable guidelines.

During decommissioning caution was taken when handling the lead based painted materials which were disposed of at an approved disposal facility. The hydrocarbon impacted sediment at the bottom of the well was removed to be taken to an off-site approved soil handling facility prior to decommissioning of the hydrometric station and stilling well (Figure 31). The shelter was removed from the well once this was completed. The stilling well was then decommissioned with the well casing cut off below grade and the ground remediated (Figures 32 and 33). It should be noted that there is no need for any further work at this site.

Figure 30. View of sediment being removed from the stilling well prior to decommissioning to be taken to an approved soil handling facility (photograph taken September 22, 2021).

Figure 31. View of the broken well casing during the decommissioning (photograph taken September 22, 2021).

Figure 32. Restored ground where the former 01EE001 hydrometric station was located to match existing land cover (photograph taken September 22, 2021).

3.3. 01DL001 Kelley River (Mill Creek) at Eight Mile Ford (F)

Figure 34 shows the stilling well with the shelter and an A-frame of the cableway on the left bank. Historically, there was no way to access the left bank (home side) during high water events. A temporary gauge was set-up on the right bank of the same gauging pool to assess whether we can relocate this station to the easier to access right bank. Figure 35 shows the A-frame of the cableway located on the right bank of the river.

Figure 33. Shelter and an A-frame of the cableway on the left bank at 01DL001 (photograph taken July 22, 2020).

Figure 34. View of the A-frame on the right bank of Kelley River showing the inactive cablecar and the temporary gauge (photograph taken April 23, 2021).

3.3.1. Environmental Assessment

Environmental consultants were retained through PSPC because of historic information indicating potential TPH contamination to conduct a preliminary environmental site assessment. This work was conducted with a batch of seven other stilling wells in the Maritimes. The results from this environmental assessment showed that the sediment from the stilling well exceeded acceptable concentration guidelines for petroleum hydrocarbons, and the paint on the A-frames of the cableway exceeded lead concentration guidelines. Other samples including surface soil and water from the stilling well were all under the applicable guidelines. The NCSCS score was obtained for this site of 25.5 (not a priority of action) under the FCSAP.

3.3.2. Outstanding Work

During the 2021 -22 FY, the cableway required decommissioning and remediation. Confirmation of the relocation of the station to the right bank was still required.

3.4. 01ED007 Mersey River below Mill Falls (F)

Figure 36 shows the A-frame and platform of the cableway at 01ED007 Mersey River below Mill Falls. The anchor system of this BOC did not pass inspection conducted April 21, 2021 and therefore could not be used for operational discharge measurements. Anchor improvements were required at this site in order to have this BOC operational. Additional mass was added to the anchor base to the anchor system on both sides of the river (Figure 37 and 38). Concrete was poured on both concrete mass anchors. A total of 103 bags (66 lb/bag) of concrete ready mix was mixed and poured on site. This included 65 bags applied to the left bank and 38 bags applied to the right anchor (6,600 lbs/3000 kg total). New dimensions of the right bank anchor: 1.3 x 0.85 x 1.6 m (LxWxH) (volume 1.77 m^3; mass 4,240 kg). New dimensions of the left bank anchor: 1.3 x 0.83 x 1.6 m (LxWxH) (volume 1.73 m^3; 4,144 mass kg). Figures 39 and 40 shows the handrails that were added to the platform to reduce OHS fall concerns. Warning signs were also added to the cableway platform as well as a lock to reduce the risk to public safety as this station is located near a walking trail.

Figure 35. View of the cableway at 01ED007 on the left bank of Mersey River (photograph taken August 9, 2020).

Figure 36. Additional mass added to the cableway anchor system on the left bank (photograph taken November 19, 2021).

Figure 37. Additional mass added to the cableway anchor system on the right bank (photograph taken November 19, 2021).

Figure 38. View of the railing added to the cableway platform on the left bank (photograph taken November 19, 2021).

Figure 39. View of the renovated BOC at 01ED007 Mersey River below Mill Falls on the left bank (Photograph taken November 19, 2021).

3.5. 01DP004 Middle River of Pictou at Rocklyn (P)

Figure 40 shows the former shelter and stilling well located at 01DP004 Middle River of Pictou at Rocklyn. This stilling well was decommissioned and the station was moved due to erosion on the left bank of the river. This station was converted to a pressure system July 28, 2021 (Figure 41), therefore, the well was no longer required. The riverbank was restored with a selection of vegetation native to the region for a naturalized erosion protection approach.

Figure 40. Former stilling well and shelter on left bank of Middle River of Pictou (photograph taken January 28, 2021).

Figure 41. New look-in shelter housing the pressure system at 01DP004 (photograph taken September 29, 2021).

3.5.1. Environmental Assessment

A preliminary environmental assessment was conducted that sampled the water and sediment at the bottom of the stilling well. Neither sample had concentration of a contaminant that exceeded relevant guidelines. The stilling well was decommissioned September 27, 2021 (Figure 43). Site restoration was completed for the bank including seeding the ground to encourage new growth and discourage the erosion of the bank (Figure 44). It should be noted that there is no need for any further work at this site.

Figure 42. View of the removal of the shelter during the decommissioning at 01DP004 (photograph taken September 27, 2021).

Figure 43. Restored and stabilized bank with native vegetation (Bayberry, Summer Sweet and Red Osier Dogwood) at 01DP004 after well was cut below grade and filled in (photograph taken September 29, 2021).

3.6. 01AC003 Carruthers Brook near St. Anthony (FP)

Figure 45 shows the stilling well at 01AC003 Carruthers Brook near St. Anthony is in poor condition as the shelter is leaning. This station has been converted to a pressure system therefore, the stilling well is no longer required. Based on historical information this well had potential PHC contamination; therefore, an environmental assessment was required prior to decommissioning the stilling well.

Figure 44. Tilting shelter located at 01AC003. Photograph taken late-October, 2021 (GHD, 2022c).

3.6.1. Preliminary Environmental Assessment

Environmental consultants were retained through PSPC because of historic information indicating potential PHC contamination to conduct a preliminary environmental site assessment. This work was conducted with a batch of three other stilling wells in the Maritimes. The results from this assessment showed that soil within 1 m of the stilling well contained concentrations of hydrocarbons that slightly exceeded the applicable guidelines. The paint from the exterior of the shelter showed exceedances of lead contamination according to applicable guidelines. Water from the stilling well was sampled and reported exceedances of hydrocarbons. Other groundwater samples taken from outside the stilling well all reported below the applicable guidelines as well as the soil samples taken from the groundwater monitoring wells. The NCSCS score of was obtained for this site of 46.3 (low priority for action) with the FCSAP.

3.6.2. Outstanding Work

The decommissioning of the stilling well and gauge house is still required at this station along with environmental remediation.

4. Newfoundland and Labrador

4.1. Overall Strategy

The overall strategy for infrastructure and construction in Newfoundland and Labrador is to prioritize renewal work at sites with multiple issues. These priorities include the following: decommissioning inactive cableways, assessing and remediation of environmental liabilities, decommissioning inactive stilling wells with poor condition shelters, replacing poor condition shelters with OHS issues, and dismantling inactive station shelters.

These priorities include decommissioning cableways that are inactive and no longer required or able to be retrofitted to BOCs. The majority of cableways in Newfoundland have wooden A-frames and many are treated with creosote as a wood preservative. These A-frames are generally aging and at the end of their lifespan. Some of the cableways have creosote foundation blocks that require special environmental consideration.

Another priority for Newfoundland and Labrador is to characterize historical environmental liabilities and remediate or risk assess them where needed. This includes re-visiting potentially mercury-contaminated stations where other work is to be conducted at the station. Specifically, this work targets the end-of life of the shelters and addressing remaining potential mercury impacts under the

shelters. This past year the potential for minor PHC contamination in some of the stilling wells was encountered. This was legacy contamination from PHC products used historically as an anti-freeze agent in the wells. In addition, there is some potential for lead paint use in older style shelters. In addition, there is creosote treated wood products two stilling wells and used in the cableways that can have associated environmental and handling considerations.

Priorities also include decommissioning of inactive stilling wells that are under shelters in poor condition that may pose an OHS fall risk. We are finding that many of these wells also have legacy PHC contamination that requires special consideration and procedures for decommissioning. In the short term, reduction of the risk associated with this includes pumping out the stilling well water and associated PHC product.

Finally, other important priorities include replacement of poor condition shelters especially where there is OHS risks or potential environmental liabilities. These include the stations that are remotely accessed in Labrador that are logistically challenging to access and conduct new construction. There are still some shelters that are inactive, but have not been dismantled, which require re-visiting.

4.2. 02YC001 Torrent River at Bristol's Pool (F)

This station had an inactive former gauge house consisting old steel casing well and look-in style shelter that is in poor condition (Figures 45 and 46). The current gauge house is not associated with this well and the current gauge house is in good condition requiring no work. During a site visit in July 2019, potential PHC product was observed in the stilling well. This old well required decommissioning so that it does not pose a risk to the public or environment. In addition, there is a manned cableway constructed of pressure treated timbers that was no longer required that required decommissioning (Figure 47).

4.2.1. Environmental Assessment

Environmental consultants were retained through PSPC for this project since there was potential for PHC observed. In December 2020, they conducted an intrusive investigation of the area surrounding the old well to develop an understanding of the extent of the potential contamination. This included grubbing of the site to improve site access with the heavy equipment (Figures 48 and 49). As well, they installed two monitoring wells and conducted hand dug test pit sampling.

The results from the sampling showed that soil samples taken in the vicinity of the former stilling well were all above the applicable guidelines for petroleum hydrocarbons. The water from the stilling well also contained concentrations of hydrocarbons above the applicable guidelines. The wooden cableway was creosote-treated. The paint samples from the shelter also exceeded applicable guidelines for lead concentration and leachability. The NCSCS score was obtained for this site of 49.2 (low priority for action) with FCSAP.

4.2.2. Outstanding Work

Decommissioning of the stilling well, shelter, and cableway and environmental remediation work still needed to be completed in 2021. The work was pushed to June 2022 because winter weather hampered site access and due to delays in issuance of a permit. Site closure reporting is still pending as of November 2022 for this project.

Figure 45. Abandoned stilling well and look-in shelter at 02YC001 Torrent River at Bristol's Pool (Photograph taken on July 15, 2019).

Figure 46. Abandoned stilling well and look-in shelter at 02YC001 Torrent River at Bristol's Pool (Photograph taken July 15, 2019).

Figure 47. Inactive manned cableway at 02YC001 Torrent River at Bristol's Pool (Photograph taken July 15, 2019).

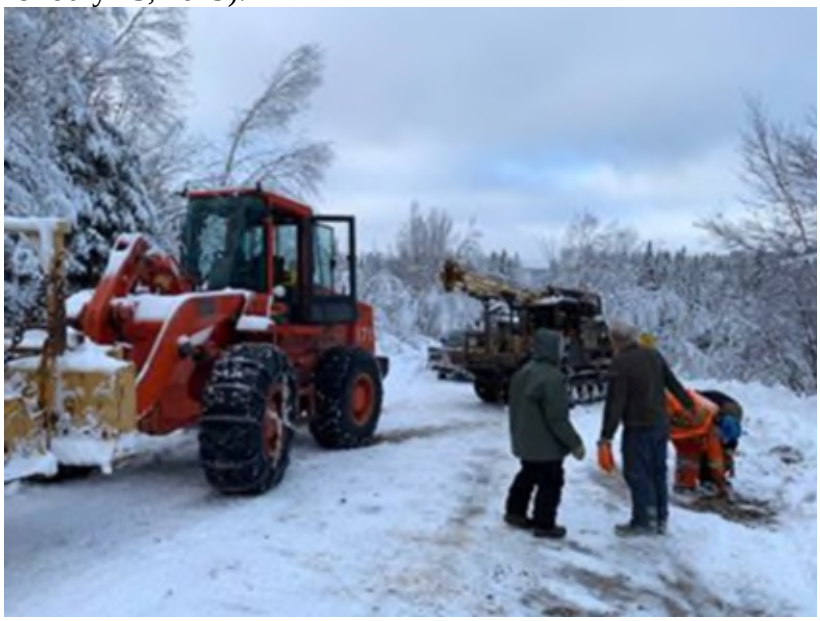


Figure 48. Equipment deployment on site for environmental assessment work. Photograph taken December 2020 (GHD, 2021c).

Figure 49. Drill rig entering the site. Photograph taken December 2020 (GHD, 2021c).

4.3. 02ZB001 Isle aux Morts River below Highway Bridge (F)

Figure 50 shows the former inactive concrete stilling well and walk-in shelter that was in poor condition at this station. The site also has a cableway with one wood creosote treated A-frame located on the right bank (Figure 51). A new shelter was installed by the PSPC retained contractors which was an aluminum tilting mast style look-in shelter mounted on a pre-cast concrete pad (Figure 52).

Figure 50. Walk-in shelter above the concrete stilling well at 02ZB001 Isle aux Morts below Highway Bridge (Photograph taken June 21, 2012).

Figure 51. Inactive manned cableway located at 02ZB001 Isle aux Morts below Highway Bridge (Photograph taken November 21, 2007).

Figure 52. New aluminum tilting mast style look-in shelter installed on a pre-cast concrete pad at 02ZB001 Isle aux Morts River below Highway Bridge (Photograph taken February 10, 2022).

4.3.1. Environmental Assessment, Decommissioning, and Remediation

The historical information of the site indicated that there was potential for PHC and confirmed creosote use at the station and therefore environmental consultants were retained through PSPC to conduct an environmental assessment. Findings indicated PHC contamination exceedances of the regulatory criteria in the groundwater of the monitoring wells and in the stilling well water. There will likely be a requirement to remove soil (~8 m^3) from around the well in addition to the concrete casing removal. Additional soil removal will be required at the A-frame for the cableway and off-site disposal at a specialized facility. There will be a requirement to re-visit this site after decommissioning to re-sample the monitoring wells to verify that post-remediation PHC concentrations in groundwater are below regulatory criteria.

The cableway and shelter were decommissioned between February 8 to 16, 2022. The water and sediment from the well were pumped out before decommissioning began. This was transported to an off-site approved disposal facility for treatment. After the removal of the shelter the concrete stilling

well was excavated and concrete debris was removed from the site (Figure 53). The well was filled in with an appropriate combination of bentonite seal, surge rock and silty sandy material. The hydrocarbon impacted soil was excavated and transported to an approved disposal facility. The remediated areas were backfilled with silty sandy material. The creosote-treated wood from the cableway was removed and sampled to be determined that it was non-hazardous thus was transported to a disposal facility (Figure 54). A post remedial sampling was conducted and reported PHC levels below the applicable guidelines. It should be noted the site closure was obtained here and there is no need for any further work.

Figure 53. View looking south of the excavation of the concrete stilling well. Photograph taken February 9, 2022 (GHD, 2022e).

Figure 54. View of the north side of the river following the backfilling of the area of the former A-frame of the cableway. Photograph taken February 10, 2022 (GHD, 2022e).

4.4. 02YO011 Exploits River below Noel Pauls Brook (FP)

Figure 55 shows the former shelter located at 02YO011 Exploits River below Noel Pauls Brook. This shelter is no longer required as a new look-in shelter was to be installed and the equipment was transferred to the new look-in during the removal of the shelter (Figure 56). The former inactive cableway at this site is shown in Figure 57. As the cableway was inactive and the equipment was to be transferred to the new look-in, the shelter and cableway at this location were no longer required and therefore decommissioned in February 2022.

Figure 55. View of former shelter at 01YO011 (photograph taken July 17, 2019).

Figure 56. Look-in shelter and pre-cast concrete pad at 01YO011 (photograph taken February 23, 2022).

Figure 57. View of former creosote treated timber cableway A-frame and platform located on the left bank of Exploits River (photograph taken July 17, 2019).

4.4.1. Environmental Assessment, Decommissioning, and Remediation

A preliminary environmental assessment was conducted at this station to assess the potential for hydrocarbons and lead paint contamination. Groundwater samples were collected and the results showed that the hydrocarbon concentrations were all below applicable guidelines. The soil samples came back with lead concentrations above the applicable criterion however, after further consideration the level of contamination was determined a low risk to terrestrial birds at the site therefore, determined not to be a chemical of potential concern. The hydrocarbons in the soil samples remained below applicable guidelines.

Prior to the decommissioning of the cableway and shelter siltation control barriers were placed downgradient from the work area. On the left bank of the river the A-frame and platform were removed and the rope wire and anchor block were removed from the right bank side from the cableway (Figure 58). The former wooden shelter was also removed as part of the decommissioning. Suspected creosote-treated wood from the cableway was removed from the site and taken to an approved hazardous waste and disposal facility.

Remediation activities were also completed including approximately 45 tonnes of PAH impacted soil excavated and removed from the site (Figure 59). This was taken to an approved treatment and disposal facility. The remediation areas were filled with clean imported rock. Post-remediation work

was also completed consisting of groundwater samples tested for PAH contaminations. These sample results showed that the PAH contaminations remained below the applicable guidelines.

Figure 58. View of cableway decommissioning on the left bank (photograph taken February 22, 2022).

Figure 59. View following the removal of the PAH contaminated soil near the former cableway. Photograph taken February 23, 2022 (GHD, 2022b).

4.5. 02ZK001 Rocky River near Colinet (F)

Figure 60 shows the former walk-in gauge house at this station, which was located over a creosote stave stilling well. There is confirmed creosote treated wooden staves at this station and potential for PHC contamination (Figure 61). Therefore, environmental consultants were retained through PSPC to conduct an environmental assessment of the site to inform the well decommissioning and remediation.

Figure 60. Former walk-in shelter above the stilling well at 02ZK001 Rocky River near Colinet (Photograph taken on July 18, 2019).

Figure 61. Creosote stave well at 02ZK001 Rocky River near Colinet (Photograph taken on July 18, 2019).

4.5.1. Environmental Assessment, Decommissioning, and Remediation

The final report for the preliminary environmental assessment that was conducted by environmental consultants hired by PSPC indicated that the water in the stilling well contained modified TPH concentrations above the applicable guidelines. There was no sediment present in the bottom of the stilling well. Soil samples taken around the shelter showed indication of contamination exceedances for the applicable guidelines. The groundwater collected from groundwater monitoring wells also exceeded applicable guidelines for hydrocarbons. The concentration from the stilling well water sample was the highest and therefore this was determined to be the source of the issue. Soil samples taken from around the area of the shelter showed no signs of contaminate exceedances. From these tests it was not required to removed soil around the stilling well however, due to ECCC internal guidelines it is common practice to remove the soil 1 m around a creosote-treated wood structures. The creosote-treated timber stilling well was decommissioned February 8, 2022. This decommissioning consisted of the removal of the former shelter. It was determined from analytical results that the creosote-treated wood was considered at non-hazardous waste therefore could be disposed at a landfill that accepts C&D waste. The water in the stilling well was pumped out using a pump, portable tote, and a vacuum truck. Due to the remote location of the site the water had to be pumped from the well into the portable tote, then from the tote into the vacuum truck to be transported to an approved disposal facility for treatment and disposal. A total of approximately 7.1 tonnes of PHC/PAH impacted soil was removed from around the former stilling well and transported to an approved facility for treatment and disposal (Figure 62). The location of the former stilling well was then filled with a bentonite seal followed by surge rock and silty sand. Post remedial sampling was done and results showed that all samples reported PAH and PHC concentrations below applicable guidelines. The shelter was relocated nearby.

Figure 62. View following the removal of the potentially contaminated soil around the former stilling well. Photograph taken February 10, 2022 (GHD, 2022f).

Figure 63. View of the new location of the shelter at 02ZK001 Rocky River near Colinet. Photograph taken in February 8, 2022 (GHD, 2022f).

4.6. 02YS005 Terra Nova River at Glovertown (FP)

Figure 64 shows the former shelter and stilling well at 02YS005 Terra Nova River at Glovertown sitting on creosote-treated wood blocks. Figure 65 shows the creosote-treated wooden cableway at this site. The shelter and cableway were decommissioned between January 24 and February 2, 2022. There is confirmed creosote-treated wood at this station and potential for PHC and mercury contamination. Therefore, environmental consultants were retained through PSPC to conduct an environmental assessment of the site to inform the well decommissioning and remediation. Figure 66 shows the new aluminum tilting mast for look-in style shelter installed to replace the old shelter on the former cableway concrete mass anchor.

Figure 64. View of former shelter at 02YS005 Terra Nova River at Glovertown (photograph taken July 17, 2019).

Figure 65. Creosote-treated wooden cableway at 02YS005 Terra Nova River at Glovertown on left bank of the river (photograph taken July 17, 2019).

Figure 66. New aluminum tilting mast for look-in style shelter at 02YS005 Terra Nova River at Glovertown installed on the former cableway concrete mass anchor (Photograph taken February 1, 2022).

4.6.1. Environmental Assessment, Decommissioning, and Remediation

A preliminary environmental assessment was conducted at this site July 23, 2021. This assessment including sampling soil around the shelter to be tested for the presence of mercury and PHC contamination, soil samples collected from around the cableway were tested for PHC contamination. The results showed that there no issues with mercury contamination as all levels were reported below the applicable guidelines. The soil samples collected near the cableway and shelter that were tested for PHC contamination all showed contamination levels above the applicable guidelines. The NCSCS score of 62.3 was obtained for this site (Class 2). As per recommendation from this preliminary environmental assessment, additional sampling was conducted prior to decommissioning. The soil and groundwater samples collected for this analysis were testing for the presence of hydrocarbons

and lead. A soil PAH concentrations for two parameters were above the applicable criterion in a soil sample collected at the footing of the shelter. The remaining soil samples reported contamination concentrations below applicable guidelines. One groundwater sample collected from a location adjacent to the cableway platform exceeded PAH concentrations for the applicable guideline while the other two groundwater samples remained below the guideline.
The decommissioning work consisted of the removal of the wooden shelter and foundation posts, and the removal of the cableway. All creosote-treated wood from the decommissioning was transported to an approved facility for disposal. Soil remediation was also required as a result of the detected contaminants in the environmental assessments. Approximately 32 tonnes of PAH impacted soil was excavated and transported to and approved site for treatment and disposal (Figure 66). The remediated areas were filled in with clean imported material. Post remedial sampling was also conducted to ensure the groundwater to ensure PAH concentrations remained below the applicable criterion.

Figure 67. View of the location that the PAH contaminated soil was excavated (photograph taken January 25, 2022).

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