

1 Q. Please provide a detailed breakdown of the forecast operating and maintenance
2 costs (O&M) for the Muskrat Falls Project which were forecast in the June 23, 2017
3 Muskrat Falls Project Update to have increased from \$34 million to \$107 million and
4 provide the most recent forecast of the O&M costs, explaining the variances from
5 the June 23, 2017 forecast to the current forecast.

6

7

8 A. The 2021 base year O&M amount outlined in the June 23, 2017 Muskrat Falls
9 Project Update was actually \$109 million, not \$107 million. This figure included an
10 estimate of approximately \$35 million for Muskrat Falls (MF) (including \$9 million of
11 environmental costs), \$55 million for the Labrador-Island Link (LIL), and \$19 million
12 for the Labrador Transmission Assets (LTA).

13

14 Subsequent to the June 2017 update, as the establishment of the Power Supply
15 operations organization evolved, Nalcor further refined the O&M cost estimate for
16 the 2018 to 2021 period as part of the Corporate Budget 2018 and 2019 processes.
17 This was based on a detailed build-up of the O&M estimate during the Budget 2018
18 process, which was then updated as part of the Budget 2019 process. Further
19 details can be found in the “LCP 2018-2021 O&M Estimates Supporting Details 2-
20 March-2018”, attached as PUB-Nalcor-050, Attachment 1 and “LCP 2019-2021 O&M
21 Estimates Supporting Details 24-Oct-2018”, attached as PUB-Nalcor-050,
22 Attachment 2, both of which were filed by Hydro with the Board as part of
23 undertakings from the 2017 General Rate Application (GRA). The current forecast
24 that is comparable to the \$109 million O&M estimate is \$76 million.

Lower Churchill Project

Budget/Forecast 2018-2021

O&M Cost Supporting Details

Boundless Energy



March 2018



Confidential and Commercially Sensitive

Outline

1. Purpose
2. Background – 2018 Budget
3. Key Assumptions
4. O&M Cost Details
5. Labour Cost Details

Appendix A – SEM Contracts Overview

Purpose

- To provide additional details on the budget/forecast O&M costs for MF, LIL and LTA over the 2018 - 2021 period

Background – 2018 Budget

Introduction

- The following will demonstrate for LIL/LTA:
 - O&M model anchored to the **need for high degree of reliability and availability**
 - **Lean, cost-effective staffing levels** consistent with other reliability links (i.e. fully-staffed model)
 - Extension of a **proven team** with a track record of safe, reliable, cost-effective delivery to its customers
 - Deliberate and **prudent risk management** and operational contingencies for the early in-service period
- Similar approach will be taken for MF with greater emphasis on it found in the 2019 budget package given current schedule for First and Full Power

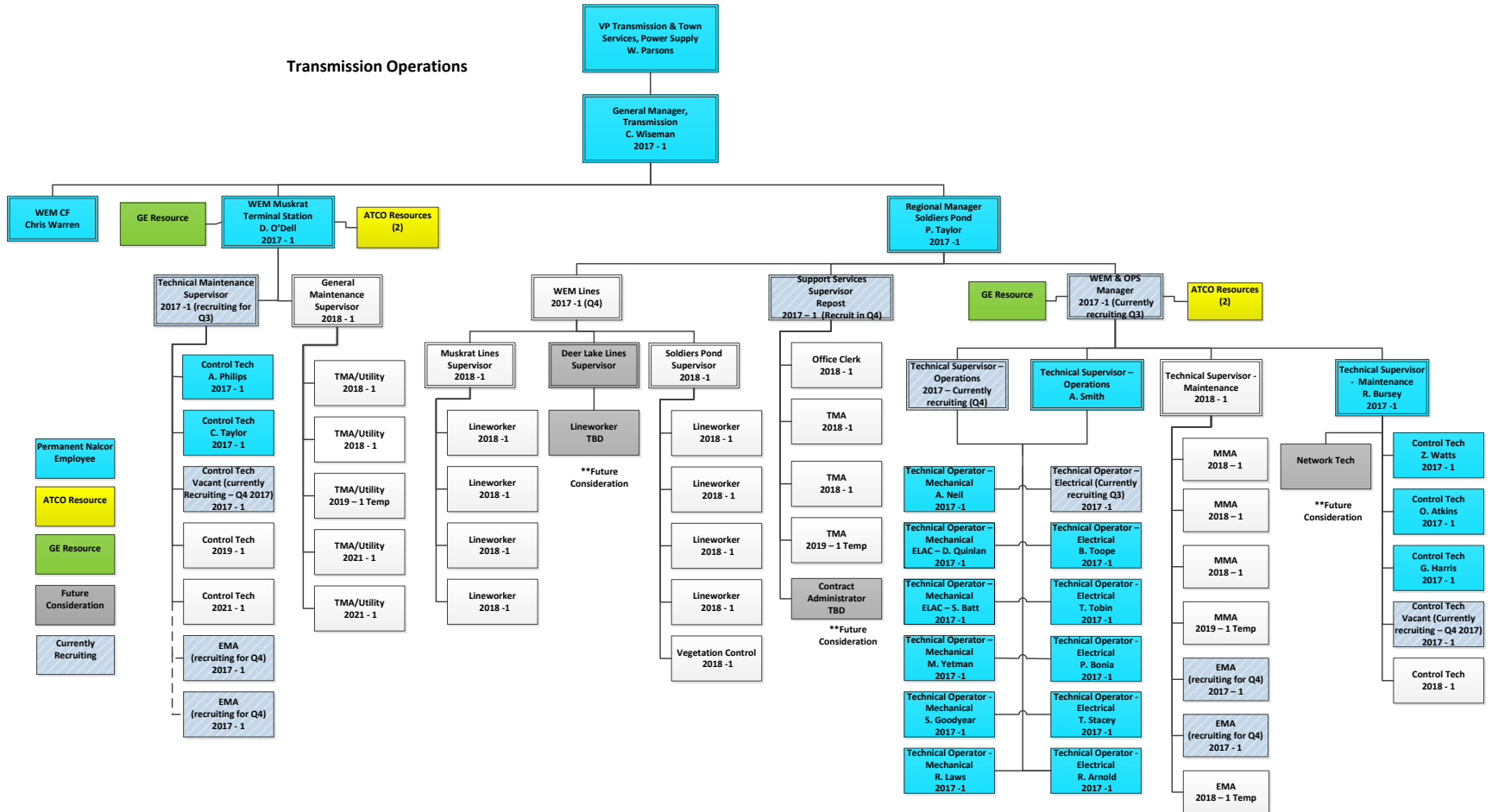
Reliability Considerations

- LTA/LIL will become the single most important source of the province's energy security
- Staffing levels informed by research into existing high-reliability links (i.e. fully-staffed model)
- Unstaffed and partially-staffed stations are the norm for merchant transmission links that are not critical to the operation of the electrical grid

Transmission Staffing Model

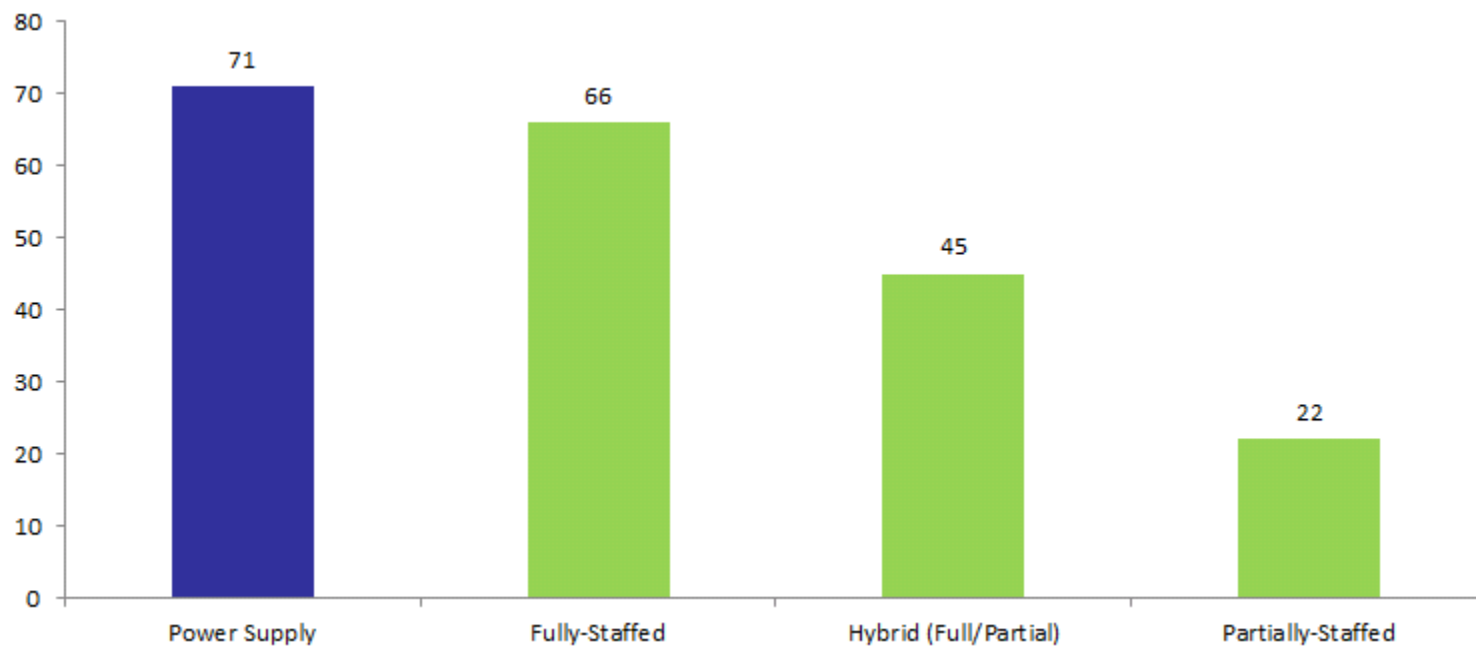
- Informed by work by TransGrid Solutions
 - Studied HVdc staffing at HQT, Manitoba Hydro, and Transpower New Zealand
 - Typical fully-staffed structure included 66 Full Time Equivalents (“FTEs”) including engineering support
- Nalcor’s Build the Production Organization (“BTPO”) structure adopted with some changes to reflect collective agreements with IBEW 1615 and 2351

Transmission Organization (September 2017)



Transmission Staffing Model

- FTE Counts for HVdc field and engineering



Budget Highlights and Assumptions - Operations

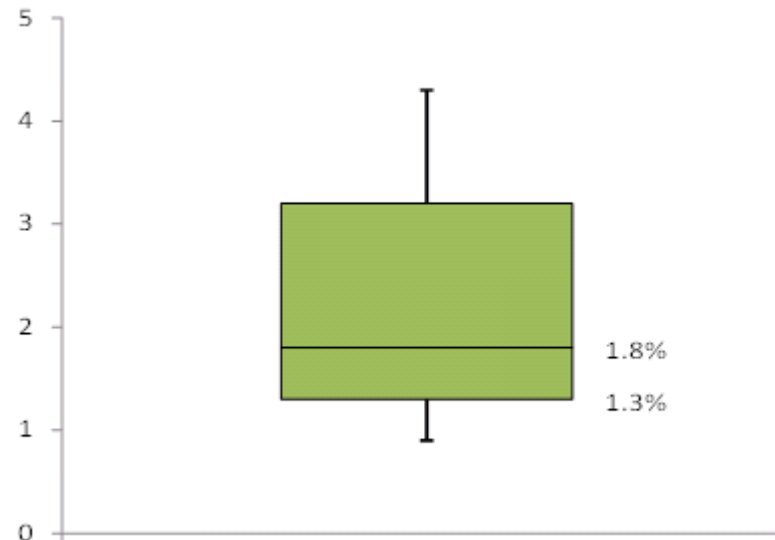
- Operating & Maintenance Cost (“O&M”) budget/forecast for 2018-2020 derived by starting with Base Year Estimate for 2021 (first full year of operations), and working backwards based on asset use requirements
- LTA and LIL will be available for interim use in 2018, to be capable of supporting Lab East load during winter 2017/18 (subject to GE commissioning not being delayed) and facilitate delivery of recall to NLH on a mono-pole basis starting by mid-year
- O&M costs for LTA is budgeted to be expensed in Q1 2018. O&M costs for LIL is budgeted to be expensed in Q2 2019, with costs prior to that being capitalized while bi-pole testing and commissioning activities are still underway (currently expected to be complete in Q1 2019). These O&M costs will be fully recovered through NLH through Transmission Use Payments prior to MF Full Power.
- O&M costs outlined herein based on best information currently available – LIL/LTA Transmission Use arrangements will include at least annual true-up mechanism, if required, to ensure NLH paying actual cost

Budget Highlights and Assumptions - Operations

- MF First and Full Power in Q4 2019 and Q3 2020, respectively – incurrence of MF O&M and recovery from NLH commences with Full Power through the Power Purchase Agreement (“PPA”)
- With MF Full Power, recovery of LIL/LTA O&M switches from Transmission Use Payments to payments under the Transmission Funding Agreement (“TFA”)/LIL Lease and Generator Interconnection Agreement (“GIA”)
- Any operational readiness costs prior to Q1 2018 for LTA, Q2 2018 for LIL and 2020 for MF will be funded under LCP/Transition to Operations (“TTO”) capital budget and recovered from NLH following MF Full Power through PPA/TFA
- Based on guidance from Nalcor’s auditors within IAS 16 and 23, Budget 2018 assumes interest costs will start being expensed for LTA in Q2 2018 and for LIL in Q2 2019, while depreciation for all LCP components will not commence until MF Full Power

Transmission Cost Benchmarking

- Distribution of Transmission O&M Costs as a percentage of Gross Asset Value



- Power Supply transmission costs at 1.2%

Total O&M Costs 2018-2021¹

(\$ millions)	Budget	Forecast	Forecast	Base Year
	2018	2019	2020	Forecast 2021
Operating Labour & Salaries	\$ 5.9	\$ 9.7	\$ 10.9	\$ 13.4
System Equipment Maintenance	14.2	24.2	27.9	33.0
Corporate & Engineering Support Labour & Salaries	3.3	12.3	13.0	14.3
Administration & Other Costs	3.7	6.3	9.0	14.8
	27.1	52.5	60.8	75.5
Environmental	0.2	0.4	3.4	9.4
Water Power Rental	-	-	5.2	15.6
IBA Payments	-	-	1.9	5.8
Total	\$ 27.3	\$ 52.9	\$ 71.3	\$ 106.3
Capital	\$ 19.7	\$ 10.9	\$ -	\$ -
Expense	7.6	42.0	71.3	106.3
Total	\$ 27.3	\$ 52.9	\$ 71.3	\$ 106.3

¹Represents costs associated with the operation of the assets and excludes construction period expenditures that are not eligible for capitalization in accordance with IFRS, but will be recovered through the long-term power supply and transmission related agreements with NLH following MF commissioning

O&M Costs 2018-2021 By Component

(\$ millions)	Budget	Forecast	Forecast	Base Year
	2018	2019	2020	Forecast 2021
LIL Operating Labour & Salaries	\$ 3.8	\$ 7.6	\$ 7.6	\$ 7.6
System Equipment Maintenance	12.1	21.8	21.8	21.9
Corporate & Engineering Support Labour & Salaries	1.8	8.9	7.8	6.8
Administration & Other Costs	2.4	4.8	5.4	7.3
Environmental	0.2	0.4	0.4	0.4
LIL Total	20.3	43.5	43.0	44.0
LTA Operating Labour & Salaries	2.1	2.1	2.1	2.1
System Equipment Maintenance	2.1	2.4	3.5	3.5
Corporate & Engineering Support Labour & Salaries	1.5	3.4	3.4	3.1
Administration & Other Costs	1.3	1.5	1.7	2.4
LTA Total	7.0	9.4	10.7	11.1
MF Operating Labour & Salaries	-	-	1.2	3.7
System Equipment Maintenance	-	-	2.6	7.6
Corporate & Engineering Support Labour & Salaries	-	-	1.8	4.4
Administration & Other Costs	-	-	1.9	5.1
Environmental	-	-	3.0	9.0
Water Power Rental	-	-	5.2	15.6
IBA Payments	-	-	1.9	5.8
MF Total	-	-	17.6	51.2
Total	\$ 27.3	\$ 52.9	\$ 71.3	\$ 106.3

Key Assumptions

Key Assumptions

Labour Costs

- Labour cost assumptions take into consideration historical benchmarking from existing Nalcor, NLH and CF operations, where applicable
- Operating labour costs based on FTE assumptions as at Q3 2017, prepared during Nalcor 2018 budget cycle
 - Transmission organizational structure has continued to evolve since then, with the establishment of a Nalcor Power Supply / CF O&M Agreement for LTA assets and the confirmation of jurisdiction for collective bargaining unit having subsequently occurred
- Corporate Support Services labour costs based on *budgeted hours x bill rate*, provided by support functions as part of the 2018 budget cycle
 - 2021 Base Year forecast based on projections as at Q3 2017
 - Base Year Equivalent Labour Hours = *Portion of FTE x 1,950 hours/year*
 - Finance costs assume dedicated LCP Finance and Commercial team of 10 FTEs (comparable to CF), with remaining FTE's representing an allocation for Nalcor Corporate Finance resources including Financial Reporting, Investment Evaluation, Tax, Treasury and AP/AR charging their time into the LCP Power Supply business unit
 - System Planning and Operations cost represent assumed Power Supply commitment to fund dedicated positions within NLSO related function
 - Executive costs represent a portion of the Power Supply Leadership team being charged into LCP O&M costs (ranging between 50-75%)
 - FTE's for other Corporate Support functions represent Nalcor Corporate resources charging their time into the LCP Power Supply business unit

Key Assumptions *(cont'd...)*

Labour Costs *(cont'd...)*

- Engineering Services costs based on FTE forecast as at Q3 2017, as provided by Power Supply Engineering Services
 - Full Power Supply Engineering Services department represents consolidation of existing Nalcor PETS and LCP engineering functions, and headcount neutral on an overall basis
 - Base Year Equivalent Labour Hours = *Portion of FTE x 1,584 hours/year*

System Equipment Maintenance (“SEM”) Costs

- System Equipment Maintenance budget based on original 2018 budget estimates, updated to reflect awarded contracts and projected requirements as at Q4 2017
- Appendix A includes an overview of the types of SEM contracts included under each component/category

Environment, Water Power Rentals & IBA

- Environment budget based on information provided by Nalcor Environment group
- Water Power Rental costs based on the Water Management Agreement as modeled by Investment Evaluation
- IBA Payments based on the Impacts and Benefits Agreement as modeled by Investment Evaluation

Key Assumptions *(cont'd...)*

Administration & Other Costs

- Considers historical benchmarking from existing Nalcor, NLH and CF operations, where applicable, and for the Base Year based on the following assumptions:

Category	Assumption
Community Betterment	Estimate for NCC commitments and Wellness Center
Professional Services	Based on history of Bay D'Espoir (Generation) and TRO (Transmission)
Transportation (fuel, mobile equip.)	\$900K per year for Direct Operations and \$54K per year for Shared Services
Travel	\$4-5K per employee per year for Direct Operations and Shared Services
Relocation	\$25K x 16 employees for Direct Operations
Office Space rental	\$15K per employee per year for Shared Services and \$60K per year for Soldier's Pond
Training	\$6K per employee per year for Direct Operations and \$2K per employee per year for Shared Services
Insurance	Provided by Nalcor Insurance group
Independent Engineer	Based on estimates for O&M Monitoring Services in the Independent Engineer contract
Office (copiers, supplies, phones, etc.)	\$3K per employee per year for Direct Operations and Shared services
Equipment Rentals	\$22K per month for Direct Operations
Safety Supplies	\$1K per employee per year for Direct Operations and Shared Services
Admin Fee IS	\$3K per employee per year for Direct Operations and Shared Services
Admin Fee HR and Safety	\$2K per employee per year (\$1.5K HR/\$0.5K Safety) for Direct Operations and Shared Services
NERC	Based on estimate provided by external consultant

Key Assumptions *(cont'd...)*

Contingency

- Base Year 2021 estimate, developed during Budget 2018 cycle and used as the starting point for prior year estimates, included a prudence contingency to address cost variations, escalation, etc. - based on 12% of total O&M Costs, less MF Water Rental and IBA payments (and carried in the SEM cost category in breakdown provided)
- Updated view on SEM costs included a drawdown of some contingency to reflect subsequent changes and actual awards

Allocations

- Shared costs and contingency were allocated to legal entities based on direct costs per year excluding MF Water Rental and IBA payments
- These allocations were calculated as follows:

	Base year			
	2018	2019	2020	2021
LIL	76%	82%	67%	52%
LTA	24%	18%	17%	13%
MF	0%	0%	16%	35%
	100%	100%	100%	100%

Key Assumptions *(cont'd...)*

Actual vs. Budget (Estimate) True-Up

- O&M costs outlined herein based on best **available** information **at the time the 2018 budget was established** – interim contractual arrangements for use of LIL/LTA prior to MF Full Power will include a quarterly true-up mechanism, if required, to ensure NLH paying actual cost
- PPA, TFA/LIL Lease and GIA already include a quarterly true-up mechanism for the long term arrangements following MF Full Power

O&M Cost Details

O&M Costs 2018-2021 By Component

(\$ thousands)	Budget	Forecast	Forecast	Base Year
	2018	2019	2020	Forecast 2021
LIL Operating Labour & Salaries	\$ 3,805.6	\$ 7,611.2	\$ 7,611.2	\$ 7,611.2
System Equipment Maintenance	12,157.0	21,872.2	21,809.0	21,908.2
Corporate & Engineering Support Labour & Salaries	1,817.6	8,873.5	7,836.8	6,795.6
Administration & Other Costs	2,355.3	4,831.2	5,359.4	7,251.3
Environmental	175.0	350.0	350.0	350.0
LIL Total	20,310.5	43,538.1	42,966.4	43,916.3
LTA Operating Labour & Salaries	2,068.2	2,068.2	2,068.2	2,068.2
System Equipment Maintenance	2,060.3	2,366.4	3,502.6	3,551.9
Corporate & Engineering Support Labour & Salaries	1,547.1	3,466.4	3,391.9	3,152.1
Administration & Other Costs	1,313.1	1,483.5	1,697.6	2,354.3
LTA Total	6,988.7	9,384.5	10,660.3	11,126.5
MF Operating Labour & Salaries	-	-	1,217.6	3,652.7
System Equipment Maintenance	-	-	2,576.8	7,560.0
Corporate & Engineering Support Labour & Salaries	-	-	1,783.1	4,408.2
Administration & Other Costs	-	-	1,870.0	5,145.4
Environmental	-	-	3,013.3	9,040.0
Water Power Rental	-	-	5,203.3	15,610.0
IBA Payments	-	-	1,946.7	5,840.0
MF Total	-	-	17,610.8	51,256.3
Total	\$ 27,299.2	\$ 52,922.6	\$ 71,237.5	\$ 106,299.1

O&M Cost Details by Component - LIL

(\$ thousands)	Budget	Forecast	Forecast	Base Year
	2018	2019	2020	Forecast 2021
Operating Labour & Salaries				
Salaries Perm/Term	\$ 2,520.3	\$ 5,040.5	\$ 5,040.5	\$ 5,040.5
Overtime (8%)	201.6	403.2	403.2	403.2
Burdens (33%)	831.7	1,663.4	1,663.4	1,663.4
Temporary Labour (10%)	252.0	504.1	504.1	504.1
	3,805.6	7,611.2	7,611.2	7,611
System Equipment Maintenance				
Stations	6,462.9	7,369.5	7,348.2	7,381.7
Facilities	2,719.4	4,423.4	4,410.6	4,430.7
Transmission	1,674.2	8,109.0	8,085.6	8,122.3
SOBI	1,300.5	1,970.3	1,964.6	1,973.5
	12,157.0	21,872.2	21,809.0	21,908.2
Corporate & Engineering Support Labour & Salaries				
Corporate Support Services	806.4	5,611.4	4,574.7	3,533.5
Engineering Services	1,011.2	3,262.1	3,262.1	3,262.1
	1,817.6	8,873.5	7,836.8	6,795.6
Administration & Other Costs				
Community Betterment	361.4	781.5	637.2	492.1
Professional Services	326.1	664.5	634.1	603.6
Transportation	320.5	644.4	636.2	628.0
Travel and relocation	298.4	606.8	582.3	557.6
Office space rental	230.3	497.9	405.9	313.5
Training	198.7	402.4	390.1	377.8
NERC	-	-	-	1,725.0
Insurance	-	-	316.6	949.9
Independent Engineer	-	-	245.5	189.6
Other (Office supplies, equipment rental, admin fees, etc)	619.9	1,233.7	1,511.5	1,414.2
	2,355.3	4,831.2	5,359.4	7,251.3
Environmental				
Environmental Effects Monitoring	175.0	350.0	350.0	350.0
Total	\$ 20,310.5	\$ 43,538.1	\$ 42,966.4	\$ 43,916.3

O&M Cost Details by Component - LTA

(\$ thousands)	Base Year			
	Budget 2018	Forecast 2019	Forecast 2020	Forecast 2021
Operating Labour & Salaries				
Salaries Perm/Term	\$ 1,369.6	\$ 1,369.6	\$ 1,369.6	\$ 1,369.6
Overtime (8%)	109.6	109.6	109.6	109.6
Burdens (33%)	452.0	452.0	452.0	452.0
Temporary Labour (10%)	137.0	137.0	137.0	137.0
	2,068.2	2,068.2	2,068.2	2,068.2
System Equipment Maintenance				
Stations	1,263.5	1,260.5	1,493.7	1,514.7
Facilities	592.0	589.1	698.1	707.9
Transmission	204.8	516.8	1,310.8	1,329.3
	2,060.3	2,366.4	3,502.6	3,551.9
Corporate & Engineering Support Labour & Salaries				
Corporate Support Services	1,276.3	1,209.5	1,135.0	895.2
Engineering Services	270.8	2,256.9	2,256.9	2,256.9
	1,547.1	3,466.4	3,391.9	3,152.1
Administration & Other Costs				
Community Betterment	113.6	168.5	158.1	124.7
Professional Services	323.9	335.5	333.3	326.2
Transportation	206.5	209.6	209.0	207.1
Travel and relocation	199.3	208.6	206.9	201.2
Office space rental	72.4	107.3	100.7	79.4
Training	105.6	110.3	109.4	106.6
NERC	-	-	-	575.0
Insurance	-	-	96.6	289.8
Independent Engineer	-	-	60.9	48.0
Other (Office supplies, equipment rental, admin fees, etc)	291.8	343.7	422.7	396.3
	1,313.1	1,483.5	1,697.6	2,354.3
Total	\$ 6,988.7	\$ 9,384.5	\$ 10,660.3	\$ 11,126.5

O&M Cost Details by Component - MF

(\$ thousands)	Budget	Forecast	Forecast	Base Year
	2018	2019	2020	Forecast 2021
Operating Labour & Salaries				
Salaries Perm/Term	\$ -	\$ -	\$ 806.4	\$ 2,419.0
Overtime (8%)	-	-	64.5	193.5
Burdens (33%)	-	-	266.1	798.3
Temporary Labour (10%)	-	-	80.6	241.9
	-	-	1,217.6	3,652.7
System Equipment Maintenance				
Facilities	-	-	1,199.0	3,518.0
Reservoir, Dams, Spillway	-	-	1,053.8	3,091.6
Powerhouse	-	-	324.0	950.4
	-	-	2,576.8	7,560.0
Corporate & Engineering Support Labour & Salaries				
Corporate Support Services	-	-	1,111.1	2,392.1
Engineering Services	-	-	672.0	2,016.1
	-	-	1,783.1	4,408.2
Administration & Other Costs				
Community Betterment	-	-	154.8	333.2
Professional Services	-	-	165.9	470.1
Transportation	-	-	42.1	118.9
Travel and relocation	-	-	79.0	214.6
Training	-	-	67.1	190.3
Insurance	-	-	920.0	2,760.0
Office space rental	-	-	98.6	212.3
Independent Engineer	-	-	59.6	128.4
Other (Office supplies, equipment rental, admin fees, etc)	-	-	282.9	717.6
	-	-	1,870.0	5,145.4
Environmental				
Environmental Effects Monitoring - Methylmercury	-	-	1,333.3	4,000.0
Environmental Effects Monitoring - Aquatic program	-	-	416.7	1,250.0
Environmental Effects Monitoring - Human health risk	-	-	333.3	1,000.0
Environmental Effects Monitoring - Other	-	-	725.0	2,175.0
Permits and other	-	-	205.0	615.0
	-	-	3,013.3	9,040.0
Water Power Rental	-	-	5,203.3	15,610.0
IBA Payments	-	-	1,946.7	5,840.0
Total	\$ -	\$ -	\$ 17,610.8	\$ 51,256.3

Labour Cost Details

Operating Labour Cost Detail by Geographic Location

(\$ thousands)

Entity	Location	FTE	Base Year			
			Budget 2018	Forecast 2019	Forecast 2020	Forecast 2021
LIL	Labrador	12	\$ 788.2	\$ 1,576.5	\$ 1,576.5	\$ 1,576.5
	Island	13	859.3	1,718.5	1,718.5	1,718.5
	Support	5	306.2	612.5	612.5	612.5
	Soldier's Pond	26	1,851.9	3,703.7	3,703.7	3,703.7
LIL Total		56	3,805.6	7,611.2	7,611.2	7,611.2
LTA	Labrador	16	2,068.2	2,068.2	2,068.2	2,068.2
MF	Labrador	27	-	-	1,217.6	3,652.7
Total		99	\$ 5,873.8	\$ 9,679.4	\$ 10,897.0	\$ 13,332.1

Includes overtime(8%), burdens(33%) and temporary labour(10%)

Operating Labour Cost Detail by Functional Discipline

(\$ thousands)

Entity	Discipline	FTE	Base Year Forecast			
			Budget 2018	Forecast 2019	Forecast 2020	Forecast 2021
LIL	Management & support services ¹	15	\$ 1,162.4	\$ 2,324.8	\$ 2,324.8	\$ 2,324.8
	Trades ²	41	2,643.2	5,286.4	5,286.4	5,286.4
LIL Total		56	3,805.6	7,611.2	7,611.2	7,611.2
LTA	Management & support services	4	561.0	561.0	561.0	561.0
	Trades	12	1,507.2	1,507.2	1,507.2	1,507.2
LTA Total		16	2,068.2	2,068.2	2,068.2	2,068.2
MF	Management & support services	6	-	-	278.3	835.0
	Trades	21	-	-	939.3	2,817.7
MF Total		27	-	-	1,217.6	3,652.7
Grand Total		99	\$ 5,873.8	\$ 9,679.4	\$ 10,897.0	\$ 13,332.1

Includes overtime(8%), burdens(33%) and temporary labour(10%)

¹Management & support services include managers, supervisors, administration and support staff

²Trades include front line and technical workers

Corporate Support & Engineering Services Details

(\$ thousands)

Department	FTE's ¹	Equivalent Labour hrs ¹	Budget 2018	Forecast 2019	Forecast 2020	Base Year Forecast 2021
Corporate Support Services						
Finance, IE & Treasury	13.8	26,813	\$ 655.3	\$ 2,146.1	\$ 2,146.0	\$ 2,146.1
System Planning & Operations	8.0	15,600	402.1	1,316.7	1,316.6	1,316.8
Executive	3.1	6,045	338.9	1,109.8	1,109.9	1,109.9
Environment	4.0	7,800	171.2	560.9	560.9	560.8
Supply Chain/Procurement	3.0	5,850	110.7	362.4	362.4	362.4
Network Services	2.0	3,900	92.2	302.0	302.1	301.9
Ind. Affairs/Comm Relations	1.0	1,950	78.4	256.7	256.7	256.7
Legal	1.0	1,950	64.5	211.4	211.4	211.3
Communications	1.0	1,950	50.7	166.1	166.1	166.1
Internal Audit	1.0	1,950	43.8	143.4	143.5	143.4
Safety	1.0	1,950	41.5	135.9	135.8	135.9
Insurance & Risk	0.5	975	33.4	109.5	109.4	109.5
	39.4	76,733	2,082.7	6,820.9	6,820.8	6,820.8
Engineering Services						
Engineering & technical specialties	22.4	35,483	840.0	3,558.1	3,966.0	4,781.9
Management & administration	12.9	20,429	442.0	1,960.9	2,225.0	2,753.2
	35.3	55,912	1,282.0	5,519.0	6,191.0	7,535.1
Total	74.7	132,645	\$ 3,364.7	\$ 12,339.9	\$ 13,011.8	\$ 14,355.9

¹ For Base Year Forecast

Corporate Support & Engineering Services Details – LIL

(\$ thousands)

Department	Equivalent Labour hrs ¹	Budget 2018	Forecast 2019	Forecast 2020	Base Year Forecast 2021
Corporate Support Services					
Finance, IE & Treasury	13,890	\$ 253.7	\$ 1,765.6	\$ 1,439.3	\$ 1,111.8
System Planning & Operations	8,081	155.7	1,083.3	883.0	682.2
Executive	3,132	131.2	913.0	744.4	575.0
Environment	4,041	66.3	461.4	376.2	290.5
Supply Chain/Procurement	3,031	42.8	298.1	243.1	187.7
Network Services	2,020	35.7	248.4	202.6	156.4
Ind. Affairs/Comm Relations	1,010	30.4	211.2	172.2	133.0
Legal	1,010	25.0	173.9	141.8	109.5
Communications	1,010	19.6	136.6	111.4	86.0
Internal Audit	1,010	17.0	118.0	96.2	74.3
Safety	1,010	16.1	111.8	91.1	70.4
Insurance & Risk	505	12.9	90.1	73.4	56.7
	39,751	806.4	5,611.4	4,574.7	3,533.5
Engineering Services					
Engineering & technical specialties	16,152	673.9	2,174.1	2,174.1	2,174.1
Management & administration	8,083	337.3	1,088.0	1,088.0	1,088.0
	24,235	1,011.2	3,262.1	3,262.1	3,262.1
Total	63,986	\$ 1,817.6	\$ 8,873.5	\$ 7,836.8	\$ 6,795.6

¹ For Base Year Forecast

Corporate Support & Engineering Services Details – LTA

(\$ thousands)

Department	Equivalent Labour hrs ¹	Budget 2018	Forecast 2019	Forecast 2020	Base Year Forecast 2021
Corporate Support Services					
Finance, IE & Treasury	3,519	\$ 401.6	\$ 380.5	\$ 357.1	\$ 281.7
System Planning & Operations	2,047	246.4	233.4	219.1	172.8
Executive	793	207.7	196.8	184.7	145.7
Environment	1,024	104.9	99.5	93.3	73.6
Supply Chain/Procurement	768	67.9	64.3	60.3	47.6
Network Services	512	56.5	53.6	50.3	39.6
Ind. Affairs/Comm Relations	256	48.0	45.5	42.7	33.7
Legal	256	39.5	37.5	35.2	27.7
Communications	256	31.1	29.5	27.6	21.8
Internal Audit	256	26.8	25.4	23.9	18.8
Safety	256	25.4	24.1	22.6	17.8
Insurance & Risk	128	20.5	19.4	18.2	14.4
	10,071	1,276.3	1,209.5	1,135.0	895.2
Engineering Services					
Engineering & technical specialties	10,193	166.1	1,384.0	1,384.0	1,384.0
Management & administration	6,429	104.7	872.9	872.9	872.9
	16,622	270.8	2,256.9	2,256.9	2,256.9
Total	26,694	\$ 1,547.1	\$ 3,466.4	\$ 3,391.9	\$ 3,152.1

¹ For Base Year Forecast

Corporate Support & Engineering Services Details – MF

(\$ thousands)

Department	Equivalent Labour hrs ¹	Budget 2018	Forecast 2019	Forecast 2020	Base Year Forecast 2021
Corporate Support Services					
Finance, IE & Treasury	9,403	\$ -	\$ -	\$ 349.6	\$ 752.6
System Planning & Operations	5,471	-	-	214.5	461.8
Executive	2,120	-	-	180.8	389.2
Environment	2,736	-	-	91.4	196.7
Supply Chain/Procurement	2,052	-	-	59.0	127.1
Network Services	1,368	-	-	49.2	105.9
Ind. Affairs/Comm Relations	684	-	-	41.8	90.0
Legal	684	-	-	34.4	74.1
Communications	684	-	-	27.1	58.3
Internal Audit	684	-	-	23.4	50.3
Safety	684	-	-	22.1	47.7
Insurance & Risk	342	-	-	17.8	38.4
	26,911	-	-	1,111.1	2,392.1
Engineering Services					
Engineering & technical specialties	9,138	-	-	407.9	1,223.8
Management & administration	5,916	-	-	264.1	792.3
	15,054	-	-	672.0	2,016.1
Total	41,965	\$ -	\$ -	\$ 1,783.1	\$ 4,408.2

¹ For Base Year Forecast

Appendix A – SEM Contracts Overview

SEM Contracts Overview (December 2017)

Component	Stations	Facilities	Transmission	SOBI	Reservoir, Dam & Spillway	Powerhouse
Labrador Island Link	<ul style="list-style-type: none"> • Converter Station/GIS/Sync Plant • Training & oversight • Diesel generators • Gases • Other 	<ul style="list-style-type: none"> • Snow clearing • Security • Mobile equipment maintenance • Inventory storage and control • HVAC (heating, ventilation, air conditioners) • Crane and hoist • Electrical contracts • Trucking/ transportation • Other 	<ul style="list-style-type: none"> • Right of Way road maintenance • Vegetation management • Emergency response retainer • EFLA consulting services (emergency response plan) • Helicopter Service • Long term crown title rentals • Other 	<ul style="list-style-type: none"> • Emergency response and maintenance • Cable storage 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A
Labrador Transmission Assets	<ul style="list-style-type: none"> • Converter Station/GIS/Sync Plant • Other 	<ul style="list-style-type: none"> • Mobile equipment maintenance • Security • Inventory storage and control • Other 	<ul style="list-style-type: none"> • Right of Way road maintenance • Vegetation management • Other 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A
Muskrat Falls	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Snow clearing • Security • Inventory storage and control • Janitorial • Mobile equipment maintenance • Other 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Debris management on log boom • North Spur dewatering oversight • Dams and Dykes • Other 	<ul style="list-style-type: none"> • Crane and hoist • HVAC (heating, ventilation, air conditioners) • Other



Lower Churchill Project Budget/Forecast 2019-2021 O&M Cost Supporting Details

October 2018

Confidential and Commercially Sensitive

Outline

1. Purpose
2. Summary Results
3. Key Assumptions
4. O&M Cost Details
5. Labour Cost Details
6. Variance Analysis

Appendix A – SEM Contracts Overview

Purpose

- To provide an update on the Budget 2019 and Forecast 2020-2021 O&M costs for LIL, LTA and MF
- Updates reflect a detailed review of 2019 costs incorporating (i) progressed Power Supply Transmission and Engineering Services organizational structures compared to previous forecast, (ii) additional SEM contract awards and advancement of the procurement approach, and (iii) input from Nalcor Corporate functions which now have greater clarity on the shared services they will provide to the Power Supply division
- Given the stage of development of Power Supply Generation operations organization, there has been a preliminary refresh of MF operating labour, SEM and environmental costs to reflect the progression of work that has been achieved since the initial O&M cost estimates were prepared in 2018
 - FTE assumptions align with preliminary benchmarking done by Navigant
 - More detailed focus on costs expected in 2019, as part of 2020 Budget process, as key positions are filled within the Generation operations organization who can provide input similar to what was provided by the Transmission operations team for the 2019 Budget

Summary Results

Total O&M Costs 2019-2021¹

(\$ millions)	Budget 2019	Forecast 2020	Forecast 2021
Operating Labour & Salaries	\$ 9.8	\$ 11.8	\$ 14.7
System Equipment Maintenance	23.5	23.4	29.3
Corporate & Engineering Support Labour & Salaries	5.2	9.2	12.8
Administration & Other Costs	7.9	9.2	15.0
	46.4	53.6	71.8
Environmental	0.9	1.6	4.2
Water Power Rental	-	5.2	15.6
IBA Payments	-	1.9	5.8
Total	\$ 47.3	\$ 62.3	\$ 97.4

¹Represents costs associated with the operation of the assets and excludes construction period expenditures that are not eligible for capitalization in accordance with IFRS, but will be recovered through the long-term power supply and transmission related agreements with NLH following MF commissioning

O&M Costs 2019-2021 By Component

(\$ millions)		Budget 2019	Forecast 2020	Forecast 2021
LIL	Operating Labour & Salaries	\$ 7.4	\$ 8.1	\$ 7.9
	System Equipment Maintenance	20.9	17.1	16.7
	Corporate & Engineering Support Labour & Salaries	4.0	6.0	6.1
	Administration & Other Costs	5.6	5.6	7.7
	Environmental	0.9	0.3	0.2
LIL Total		38.8	37.1	38.6
LTA	Operating Labour & Salaries	2.4	2.4	2.3
	System Equipment Maintenance	2.6	3.3	3.5
	Corporate & Engineering Support Labour & Salaries	1.2	1.8	2.0
	Administration & Other Costs	2.3	1.9	2.5
LTA Total		8.5	9.4	10.3
MF	Operating Labour & Salaries	-	1.3	4.5
	System Equipment Maintenance	-	3.0	9.1
	Corporate & Engineering Support Labour & Salaries	-	1.4	4.7
	Administration & Other Costs	-	1.7	4.8
	Environmental	-	1.3	4.0
	Water Power Rental	-	5.2	15.6
	IBA Payments	-	1.9	5.8
MF Total		-	15.8	48.5
Total		\$ 47.3	\$ 62.3	\$ 97.4
	Previous forecast	52.9	71.3	106.3
Variance		\$ (5.6)	\$ (9.0)	\$ (8.9)

Key Assumptions

Key Assumptions

Project Schedule

- Completion of LIL monopole testing and trial operations in January 2019
- Completion of LTA testing and trial operations in November 2018
- Completion of LIL bi-pole testing and trial operations in January 2020
- Completion of MF full commissioning in September 2020
- 2021 first full year operations for all assets

Key Assumptions *(cont'd...)*

Labour Costs

- Operating labour costs based on FTE assumptions as at Q2/Q3 2018, prepared during Nalcor 2019 budget cycle, based on *budgeted hours x bill rate*
- Corporate Support Services labour costs based on *budgeted hours x bill rate*, provided by support functions as part of the 2019 budget cycle
 - Labour hours estimate provided by various departments, converted to FTE based on 1950 hours/year x 85% for billable time
 - Finance costs for 2019 assume a portion of LCP Finance and Commercial team hours charged to O&M versus LCP capital cost (equivalent to approx 4 FTE's), with remaining FTE's representing an allocation for Nalcor Corporate Finance resources including Financial Reporting, Investment Evaluation, Tax, Treasury and AP/AR charging their time into the LCP Power Supply business unit
 - Executive costs represent a portion of the Power Supply Leadership team being charged into LCP O&M costs (ranging between 15-70%)
 - FTE's for other Corporate Support functions represent Nalcor Corporate resources charging their time into the LCP Power Supply business unit

Key Assumptions *(cont'd...)*

Labour Costs *(cont'd...)*

- Engineering Services costs based on FTE forecast as at Q2/Q3 2018, as provided by Power Supply Engineering Services
 - Labour hours estimate provided by Engineering Services, converted to FTE based on average of 2039 hours/year x 75% for billable time

System Equipment Maintenance (“SEM”) Costs

- System Equipment Maintenance budget based on currently awarded contracts and projected requirements as at Q2/Q3 2018 (see Appendix A)

Environment, Water Power Rentals & IBA

- Environment budget based on information provided by Nalcor Environment group
- Water Power Rental costs based on the Water Lease as modeled by Investment Evaluation
- IBA Payments based on the Impacts and Benefits Agreement as modeled by Investment Evaluation

Key Assumptions *(cont'd...)*

Administrative & Other Costs

- Budget based on estimates provided by various managers and include such categories as training, travel, warehousing, equipment rentals and professional services

Contingency

- Included in the SEM cost category is a prudence contingency to address cost variations, escalation, etc. - based on 12% of total O&M Costs for each asset

Actual vs. Budget (Estimate) True-Up

- O&M costs outlined herein based on best information currently available – LIL/LTA Interim TFA's include quarterly true-up mechanism to ensure NLH paying actual cost
- PPA, TFA/LIL Lease and GIA already include a quarterly true-up mechanism for the long term arrangements following MF Full Power

O&M Cost Details

O&M Costs 2019-2021 By Component

(\$ thousands)		Budget 2019	Forecast 2020	Forecast 2021
LIL	Operating Labour & Salaries	\$ 7,444.7	\$ 8,149.2	\$ 7,886.2
	System Equipment Maintenance	20,933.8	17,104.3	16,719.5
	Corporate & Engineering Support Labour & Salaries	3,991.7	5,960.7	6,071.2
	Administration & Other Costs	5,591.0	5,633.5	7,668.1
	Environmental	888.0	258.0	203.0
LIL Total		38,849.2	37,105.7	38,548.0
LTA	Operating Labour & Salaries	2,347.6	2,406.3	2,285.4
	System Equipment Maintenance	2,603.8	3,324.9	3,531.7
	Corporate & Engineering Support Labour & Salaries	1,203.8	1,770.4	1,967.2
	Administration & Other Costs	2,296.1	1,897.4	2,535.6
LTA Total		8,451.3	9,399.0	10,319.9
MF	Operating Labour & Salaries	-	1,263.1	4,473.1
	System Equipment Maintenance	-	2,998.1	9,089.4
	Corporate & Engineering Support Labour & Salaries	-	1,388.8	4,736.6
	Administration & Other Costs	-	1,675.3	4,812.2
	Environmental	-	1,336.8	3,972.0
	Water Power Rental	-	5,203.3	15,610.0
	IBA Payments	-	1,946.7	5,840.0
MF Total		-	15,812.1	48,533.3
Total		\$ 47,300.5	\$ 62,316.8	\$ 97,401.2

O&M Cost Details by Component - LIL

Rate Mitigation Options and Impacts Reference, Page 14 of 32

(\$ thousands)	Budget 2019	Forecast 2020	Forecast 2021
Operating Labour & Salaries			
Salaries & Benefits	\$ 6,931.8	\$ 7,623.5	\$ 7,347.4
Overtime	512.9	525.7	538.8
	7,444.7	8,149.2	7,886.2
System Equipment Maintenance			
Stations	5,885.6	2,245.1	2,347.2
Transmission	8,842.9	8,568.9	9,720.8
Facilities	6,142.1	4,178.4	4,368.4
SOBI	63.2	2,111.9	283.1
	20,933.8	17,104.3	16,719.5
Corporate & Engineering Support Labour & Salaries			
Corporate Support Services	1,836.1	3,818.5	3,234.1
Engineering Services	2,155.6	2,142.2	2,837.1
	3,991.7	5,960.7	6,071.2
Administration & Other Costs			
Travel and Relocation	1,117.3	1,022.0	945.8
Training	1,106.4	651.7	299.8
Building Rentals	880.5	902.5	925.1
Admin Fees and Fixed Charge	775.3	794.7	814.6
Professional Services	488.8	601.0	616.0
Equipment Rentals	442.8	384.7	301.0
Transportation	288.0	295.2	302.6
Memberships, Subscriptions and Licenses	249.3	255.5	261.9
Advertising, Donations and Community	112.6	115.4	118.3
Safety Supplies	57.0	58.4	59.9
Utilities	55.7	57.1	58.5
NERC	-	-	1,725.0
Insurance	-	316.6	949.9
Independent Engineer	-	81.0	189.6
Miscellaneous	17.3	97.7	100.1
	5,591.0	5,633.5	7,668.1
Environmental	888.0	258.0	203.0
Total	\$ 38,849.2	\$ 37,105.7	\$ 38,548.0

O&M Cost Details by Component - LTA

(\$ thousands)	Budget 2019	Forecast 2020	Forecast 2021
Operating Labour & Salaries			
Salaries & Benefits	\$ 2,180.8	\$ 2,235.3	\$ 2,110.1
Overtime	166.8	171.0	175.3
	2,347.6	2,406.3	2,285.4
System Equipment Maintenance			
Stations	597.9	570.0	591.8
Transmission	797.3	1,451.3	1,506.9
Facilities	1,208.6	1,303.6	1,433.0
	2,603.8	3,324.9	3,531.7
Corporate & Engineering Support Labour & Salaries			
Corporate Support Services	454.0	928.8	797.0
Engineering Services	749.8	841.6	1,170.2
	1,203.8	1,770.4	1,967.2
Administration & Other Costs			
Training	1,024.3	442.1	273.6
Admin Fees and Fixed Charge	368.7	377.9	387.3
Travel and Relocation	274.2	186.9	168.8
Equipment Rentals	246.6	252.8	259.1
Transportation	172.4	176.7	181.1
Professional Services	137.4	240.8	246.8
Advertising, Donations and Community	31.3	32.1	32.9
Safety Supplies	10.7	11.0	11.3
Memberships, Subscriptions and Licenses	9.9	10.1	10.4
Utilities	8.2	8.4	8.6
Building Rentals	5.7	-	-
NERC	-	-	575.0
Insurance	-	96.6	289.8
Independent Engineer	-	20.1	48.0
Miscellaneous	6.7	41.9	42.9
	2,296.1	1,897.4	2,535.6
Total	\$ 8,451.3	\$ 9,399.0	\$ 10,319.9

O&M Cost Details by Component - MF

(\$ thousands)	Budget 2019	Forecast 2020	Forecast 2021
Operating Labour & Salaries			
Salaries & Benefits	\$ -	\$ 1,198.6	\$ 4,279.6
Overtime	-	64.5	193.5
	-	1,263.1	4,473.1
System Equipment Maintenance			
Facilities	-	1,264.0	4,082.5
Reservoir, Dams, Spillway	-	1,383.2	3,956.7
Powerhouse	-	350.9	1,050.2
	-	2,998.1	9,089.4
Corporate & Engineering Support Labour & Salaries			
Corporate Support Services	-	974.0	2,351.7
Engineering Services	-	414.8	2,384.9
	-	1,388.8	4,736.6
Administration & Other Costs			
Insurance	-	920.0	2,760.0
Professional Services	-	165.9	470.1
Building Rentals	-	98.6	212.3
Equipment Rentals	-	82.8	206.6
Travel and Relocation	-	79.0	214.6
Admin Fees and Fixed Charge	-	77.9	205.8
Training	-	67.1	190.3
Utilities	-	62.8	146.6
Transportation	-	42.1	118.9
Independent Engineer	-	19.7	128.4
Safety Supplies	-	15.6	41.2
Miscellaneous	-	43.8	117.4
	-	1,675.3	4,812.2
Environmental			
EEM Monitoring and other	-	1,336.8	3,972.0
	-	1,336.8	3,972.0
Water Power Rental	-	5,203.3	15,610.0
IBA Payments	-	1,946.7	5,840.0
Total	\$ -	\$ 15,812.1	\$ 48,533.3

Labour Cost Details

Operating Labour Cost Detail by Functional Discipline

(\$ thousands)

Entity	Discipline	Budget 2019		Forecast 2020		Forecast 2021	
		FTE ¹	Amount	FTE	Amount	FTE	Amount
LIL	Management & Support Services ²	15	\$ 2,387.8	15	\$ 2,447.5	14	\$ 2,508.7
	Trades ³	37	5,056.9	41	5,701.7	39	5,377.5
LIL Total		52	7,444.7	56	8,149.2	53	7,886.2
LTA	Management & Support Services	3	548.2	3	561.9	2	575.9
	Trades	10	1,799.4	10	1,844.4	10	1,709.5
LTA Total		13	2,347.6	13	2,406.3	12	2,285.4
MF	Management & Support Services	-	-	3	450.7	9	1,421.9
	Trades	-	-	6	812.4	22	3,051.2
MF Total		-	-	9	1,263.1	31	4,473.1
Grand Total		65	\$ 9,792.3	78	\$ 11,818.6	96	\$ 14,644.7

¹FTE's represent net labour recharge-in

²Management & Support Services include managers, supervisors, administration and support staff

³Trades include front line and technical workers

Corporate Support & Engineering Services Details - Total

(\$ thousands)

Department	Budget 2019			Forecast 2020			Forecast 2021		
	FTE	Labour hrs	Amount	FTE	Labour hrs	Amount	FTE	Labour hrs	Amount
Corporate Support Services									
Finance, IE & Treasury	3.9	6,515	\$ 572.1	13.8	22,792	\$ 2,051.5	13.8	22,791	\$ 2,102.6
Executive	1.5	2,518	525.7	3.1	5,138	1,099.5	3.1	5,138	1,127.0
Environment	2.6	4,389	366.1	3.7	6,076	519.5	5.0	8,287	726.3
Supply Chain/Procurement	1.0	1,621	111.4	3.0	4,972	350.3	3.0	4,973	359.0
Network Services/IT	0.5	900	59.1	2.0	3,315	223.1	2.0	3,315	228.7
Ind. Affairs/Comm Relations	0.5	816	69.4	1.0	1,658	144.5	1.0	1,658	148.2
Legal	0.5	829	88.6	1.0	1,658	181.6	1.0	1,658	186.2
Communications	0.5	849	74.8	1.0	1,658	149.7	1.0	1,658	153.5
Internal Audit	-	-	-	1.0	1,658	149.2	1.0	1,658	152.9
Safety	1.2	1,970	151.2	1.5	2,487	195.7	2.0	3,315	267.4
Insurance & Risk	-	-	-	0.5	829	74.6	0.5	829	76.5
Human Resources	1.3	2,125	271.7	3.0	4,972	526.2	4.0	6,630	686.5
Independent Coordinator	-	-	-	0.3	552.0	55.9	1.0	1,657.5	168.0
	13.5	22,532	2,290.1	34.9	57,213	5,721.3	38.4	63,568	6,382.8
Engineering Services									
Engineering & Technical Specialties	15.1	23,039	1,968.4	15.8	24,474	2,282.4	28.5	44,226	4,179.8
Management & Administration	6.2	9,523	937.0	6.8	10,540	1,116.2	13.9	21,492	2,212.4
	21.3	32,562	2,905.4	22.6	35,014	3,398.6	42.4	65,718	6,392.2
Total	34.8	55,094	\$ 5,195.5	57.5	92,227	\$ 9,119.9	80.8	129,286	\$ 12,775.0

Corporate Support & Engineering Services Details – LIL

(\$ thousands)

Department	Budget 2019			Forecast 2020			Forecast 2021		
	FTE	Equivalent Labour hrs	Amount	FTE	Equivalent Labour hrs	Amount	FTE	Equivalent Labour hrs	Amount
Corporate Support Services									
Finance, IE & Treasury	3.1	5,130	\$ 450.1	9.2	15,286	\$ 1,375.9	7.1	11,807	\$ 1,089.3
Executive	1.2	1,931	409.3	2.1	3,446	737.4	1.6	2,662	583.9
Environment	2.3	3,745	309.8	2.7	4,475	382.6	2.7	4,475	392.2
Supply Chain/Procurement	0.8	1,297	89.1	2.0	3,335	234.9	1.6	2,576	186.0
Network Services/IT	0.4	720	47.3	1.3	2,223	149.6	1.0	1,717	118.5
Ind. Affairs/Comm Relations	0.4	653	55.5	0.7	1,112	96.9	0.5	859	76.8
Legal	0.5	829	88.6	0.7	1,112	121.8	0.5	859	96.5
Communications	0.4	679	59.8	0.7	1,112	100.4	0.5	859	79.5
Internal Audit	-	-	-	0.7	1,112	100.1	0.5	859	79.2
Safety	1.1	1,896	146.1	1.0	1,668	131.2	1.0	1,717	138.5
Insurance & Risk	-	-	-	0.3	556	50.0	0.3	429	39.6
Human Resources	0.9	1,512	180.5	2.0	3,335	337.7	2.1	3,435	354.1
	11.1	18,392	1,836.1	23.4	38,772	3,818.5	19.4	32,254	3,234.1
Engineering Services									
Engineering & Technical Specialties	10.5	16,069	1,390.1	9.6	14,800	1,381.5	12.5	19,373	1,829.6
Management & Administration	5.3	8,125	765.5	4.8	7,471	760.7	6.3	9,779	1,007.5
	15.8	24,194	2,155.6	14.4	22,271	2,142.2	18.8	29,152	2,837.1
Total	26.9	42,586	\$ 3,991.7	37.8	61,043	\$ 5,960.7	38.2	61,406	\$ 6,071.2

Corporate Support & Engineering Services Details – LTA

(\$ thousands)

Department	Budget 2019			Forecast 2020			Forecast 2021		
	FTE	Labour hrs	Amount	FTE	Labour hrs	Amount	FTE	Labour hrs	Amount
Corporate Support Services									
Finance, IE & Treasury	0.8	1,385	\$ 122.0	2.3	3,793	\$ 341.4	1.8	2,991	\$ 275.9
Executive	0.4	587	116.4	0.5	855	183.0	0.4	674	147.8
Environment	0.4	644	56.3	0.3	497	42.5	0.3	497	43.6
Supply Chain/Procurement	0.2	324	22.3	0.5	827	58.3	0.4	653	47.1
Network Services/IT	0.1	180	11.8	0.3	552	37.2	0.3	435	30.0
Ind. Affairs/Comm Relations	0.1	163	13.9	0.2	276	24.1	0.1	218	19.5
Legal	-	-	-	0.2	276	30.2	0.1	218	24.5
Communications	0.1	170	15.0	0.2	276	24.9	0.1	218	20.2
Internal Audit	-	-	-	0.2	276	24.8	0.1	218	20.1
Safety	-	74	5.1	0.2	414	32.6	0.3	435	35.1
Insurance & Risk	-	-	-	0.1	138	12.4	0.1	109	10.1
Human Resources	0.4	613	91.2	0.5	827	117.4	0.5	870	123.1
	2.5	4,140	454.0	5.5	9,007	928.8	4.5	7,536	797.0
Engineering Services									
Engineering & Technical Specialties	4.6	6,970	578.3	4.5	7,071	649.1	6.2	9,689	902.5
Management & Administration	0.9	1,398	171.5	0.9	1,384	192.5	1.2	1,896	267.7
	5.5	8,368	749.8	5.4	8,455	841.6	7.4	11,585	1,170.2
Total	8.0	12,508	\$ 1,203.8	10.9	17,462	\$ 1,770.4	11.9	19,121	\$ 1,967.2

Corporate Support & Engineering Services Details – MF

(\$ thousands)

Department	Budget 2019			Forecast 2020			Forecast 2021		
	FTE	Labour hrs	Amount	FTE	Labour hrs	Amount	FTE	Labour hrs	Amount
Corporate Support Services									
Finance, IE & Treasury	-	-	\$ -	2.2	3,713	\$ 334.2	4.8	7,993	\$ 737.4
Executive	-	-	-	0.5	837	179.1	1.1	1,802	395.3
Environment	-	-	-	0.7	1,104	94.4	2.0	3,315	290.5
Supply Chain/Procurement	-	-	-	0.5	810	57.1	1.1	1,744	125.9
Network Services	-	-	-	0.3	540	36.3	0.7	1,163	80.2
Ind. Affairs/Comm Relations	-	-	-	0.2	270	23.5	0.4	581	51.9
Legal	-	-	-	0.2	270	29.6	0.4	581	65.2
Communications	-	-	-	0.2	270	24.4	0.4	581	53.8
Internal Audit	-	-	-	0.2	270	24.3	0.4	581	53.6
Safety	-	-	-	0.2	405	31.9	0.7	1,163	93.8
Insurance & Risk	-	-	-	0.1	135	12.2	0.2	291	26.8
Human Resources	-	-	-	0.5	810	71.1	1.4	2,325	209.3
Independent Coordinator	-	-	-	0.3	552	55.9	1.0	1,658	168.0
	-	-	-	6.1	9,986	974.0	14.6	23,778	2,351.7
Engineering Services									
Engineering & Technical Specialties		-	-	1.7	2,603	251.8	9.8	15,164	1,447.7
Management & Administration		-	-	1.1	1,685	163.0	6.4	9,817	937.2
		-	-	2.8	4,288	414.8	16.2	24,981	2,384.9
Total		-	\$ -	8.9	14,274	\$ 1,388.8	30.8	48,759	\$ 4,736.6

Variance Analysis

Variance Analysis – LIL 2019

Updated view for Budget 2019 for LIL is \$4.7M lower compared to previously provided Forecast 2019 estimates prepared during the Budget 2018 process. Variance is primarily a result of:

Operating Labour & Salaries

- Portion of time allocated to LCP capital costs relating to bi-pole commissioning and testing activities
- Partially offset by higher rotational travel costs which roll up to salaries

System Equipment Maintenance

- Updates to contract values based on current awards/updated projections for GE/ATCO/Growler (maintenance and operating assistance, mentoring, oversight contracts)
- Lower costs in 2019 for vegetation management which will ramp up in 2021 base year
- Removed SOBI inspection related costs as to be completed in 2018, and will be a bi-annual inspection thereafter
- Partially offset by i) higher estimated contract costs as a result of the Emergency Response Plan review (EFLA) including such items as simulation exercises and inventory storage and ii) additional materials, contracts, tools, supplies and other costs as a result of detailed review

Variance Analysis – LIL 2019 (cont'd...)

Corporate & Engineering Support Labour & Salaries

- System Planning & Operations removed from Budget 2019 as already budgeted within NLSO
- Support costs such as Finance, Executive, Supply Chain etc. allocated between both O&M and LCP capital costs on a staged basis until MF commissioning occurs and all assets are fully operational
- Lower average bill rate (~30%) for Engineering Services group than previously forecasted and fixed charge component budgeted as part of admin fees

Partially offset by higher costs for Budget 2019 as compared to previously provided Forecast 2019 primarily a result of:

Administration & Other Costs

- Increase in training costs to reflect detailed plan for first year of operations as employees are trained in new assets – expected to decrease in subsequent years
- Increase in travel costs to reflect updated view on travel requirements for training and to provide coverage for geographical area of oversight
- Increase in building rental to reflect current/projected warehousing requirements
- Increase in equipment rental to reflect additional rentals required until capital purchasing decisions are made
- Fixed charge on Engineering Services labour was forecasted as part of labour cost but now budgeted as admin fees
- Partially offset by reduction for community betterment - costs now budgeted in Nalcor Other Power Supply Business Unit, and will not be part of costs recovered from Hydro

Variance Analysis – LIL 2020/21

Updated view for Forecast 2020 and 2021 for LIL is \$5.9M and \$5.4M lower compared to previously provided Forecast for 2020 and 2021, respectively. Variances are primarily a result of:

System Equipment Maintenance

- Reduction compared to previous estimates for ATCO/Growler contracts for mentoring and oversight activities
- For 2021, removal of SOBI inspection related costs which is forecasted to be a bi-annual inspection in 2018 and 2020
- Partially offset by higher estimated costs as a result of simulation exercises as part of the Emergency Response Plan review (EFLA)

Corporate & Engineering Support Labour & Salaries

- System Planning & Operations removed from Forecast 2020 and 2021 as already budgeted within NLSO
- Lower average bill rate (~30%) for Engineering Services group than previously forecasted and fixed charge component budgeted as part of admin fees

Variance Analysis – LTA 2019

Updated view for Budget 2019 for LTA is \$0.9M lower compared to previously provided Forecast 2019 estimates prepared during the Budget 2018 process. Variance is primarily a result of:

Corporate & Engineering Support Labour & Salaries

- System Planning & Operations removed from Budget 2019 as already budgeted within NLSO
- Support costs such as Finance, Executive, Supply Chain etc. allocated between both O&M and LCP capital costs on a staged basis until MF commissioning occurs and all assets are fully operational
- Lower estimated hours and average bill rate (~30%) for Engineering Services group than previously forecasted and fixed charge component budgeted as part of admin fees

Variance Analysis – LTA 2019 (cont'd...)

Partially offset by higher costs for Budget 2019 as compared to previously provided Forecast 2019 primarily a result of:

Operating Labour & Salaries

- Higher bill rate for CF employees than Nalcor/NLH which was used in forecast during 2018 budget process

System Equipment Maintenance

- Addition of a vegetation management program to start in 2019 (vs 2020)
- Additional materials, contracts, tools, supplies and other costs as a result of detailed review
- Partially offset by i) updates to contract values based on current awards/updated projections for GE (maintenance and operating assistance) and ii) lower costs in 2019 for road maintenance which will ramp up in 2021 base year

Administration & Other Costs

- Increase in training costs to reflect detailed plan for first year of operations as employees are trained in new assets – expected to decrease in subsequent years
- Increase in equipment rental to reflect additional rentals required until capital purchasing decisions are made
- Fixed charge on Engineering Services labour was forecasted as part of labour cost but now budgeted as admin fees
- Partially offset by i) reduction for community betterment - costs now budgeted in Nalcor Other Power Supply Business Unit, and will not be part of costs recovered from Hydro

Variance Analysis – LTA 2020/21

Updated view for Forecast 2020 and 2021 for LTA is \$1.3M and \$0.8M lower compared to previously provided Forecast for 2020 and 2021, respectively.

Variances are primarily a result of:

System Equipment Maintenance

- Reduction for GE contract value for maintenance and operating assistance based on current award/updated projections

Corporate & Engineering Support Labour & Salaries

- System Planning & Operations removed from Forecast 2020 and 2021 as already budgeted within NLSO
- Lower average bill rate (~30%) for Engineering Services group than previously forecasted and fixed charge component budgeted as part of admin fees

Variance Analysis – MF 2020/2021

Updated view for Forecast 2020 and 2021 for MF is \$1.8M and \$2.7M lower compared to previously provided Forecast for 2020 and 2021, respectively. Variances are primarily a result of:

Environmental

- Lower costs for environmental effects monitoring for methylmercury, human health risk, aquatic program, ice formation
- Defer of environmental effects monitoring for forest avifauna and winter and summer ground surveys to 2022/24
- Removal of permit fees which apply to 2019 only

Partially offset by higher forecasted costs primarily a result of:

System Equipment Maintenance

- Additional identified contracts such as debris management on the log boom

Appendix A – SEM Contracts Overview

SEM Contracts Overview – Base Year (July 2018)

Component	Stations	Facilities	Transmission	SOBI	Reservoir, Dam & Spillway	Powerhouse
Labrador Island Link	<ul style="list-style-type: none"> • Converter Station/GIS/Sync Plant • Diesel generators • Gases • Other 	<ul style="list-style-type: none"> • Snow clearing • Security • Mobile equipment maintenance • Inventory storage and control • HVAC (heating, ventilation, air conditioners) • Crane and hoist • Janitorial/Waste removal • Electrical contracts • Trucking/ transportation • Other 	<ul style="list-style-type: none"> • Right of Way road maintenance • Vegetation management • Emergency response initiatives • Helicopter Service • Long term crown title rentals • Other 	<ul style="list-style-type: none"> • Routine maintenance and inspection 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A
Labrador Transmission Assets	<ul style="list-style-type: none"> • Converter Station/GIS/Sync Plant • Other 	<ul style="list-style-type: none"> • Maintenance and other costs for MF Admin building (cost shared) • Snow clearing • HVAC (heating, ventilation, air conditioners) • Mobile equipment maintenance • Security • Other 	<ul style="list-style-type: none"> • Right of Way road maintenance • Vegetation management • Other 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A
Muskat Falls	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Security • Inventory storage and control • Janitorial/Waste removal • Mobile equipment maintenance • Snow clearing • Other 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Debris management on log boom • North Spur dewatering • Dams and Dykes oversight • Other 	<ul style="list-style-type: none"> • Crane and hoist • HVAC (heating, ventilation, air conditioners) • Other