From: Nikolay Argirov
To: gbennett@nalcorenergy.com; jamesmeaney@nalcorenergy.com
Subject: FW: LCP DG3 Estimate Accuracy
Date: Monday, April 14, 2014 11:56:04 PM
Attachments: _.png
_.png
LOWER CHURCHILL PROJECT INDEPENDENT ENGINEER"S REPORT - INTERIM NOV 29, 2013 rev2 slip pages.zip
LOWER CHURCHILL PROJECT IER - INTERIM NOV 29 2013 changed page 174-175 r....pdf

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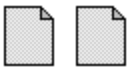
Gilbert ,

Attached is an updated ZIP file (marked “rev2”), which includes the changed pages 174-175. I’ve attached those pages separately for convenience of review.

Please disregard the ZIP file I sent earlier.

Regards,

Nik



LIST OF ACRONYMS AND ABBREVIATIONS (cont'd)

KA	kiloamps
Km	kilometer
kV	kilovolt
LC	Lower Churchill
LCC	Line Commutated Converter
LCP	Lower Churchill Project
LD	liquidated damage
Lease	Water Lease Agreement
LIL	Labrador Island Link
LOA	leave of absence
LRA	liquidity reserve
LTA	Labrador Transmission Assets
LTAP	Labrador Transmission Assets Project
MAF	Mean Annual Flow
MF	Muskrat Falls
MFGS	Muskrat Falls Generating Station
MI	mass-impregnated
ML	Maritime Link
MOF	maintenance outage factor
msl	mean sea level
MVA	megavolt amperes
MVAR	megavolt ampere reactive
MW	megawatt(s)
MWc	megawatts continuous
MWH	MWH Canada, Inc.
MWhour	megawatt hour
NAERC	North American Electric Reliability Corporation
Nalcor	Nalcor Energy
Nalcor/MWH Agreement	agreement between Nalcor and MWH to prepare the IER
NEHRP	National Earthquake Hazards Reduction Program
NLH	Newfoundland and Labrador Hydro
NWPA	Navigable Water Protection Act
O&M	operations and maintenance
OHGW	overhead ground wire
ONAF	oil filled unit that has natural convection flow in the tank and utilizes has fans added for forced air external cooling
ONAN	oil filled unit that has natural convection flow in the tank and utilizes natural air convection cooling externally
OPGW	optical ground wire
P&C	Protection & Control
P50	50 percent
PGA	peak ground acceleration
PM	project manager
PMF	Probable Maximum Flood
PMI	Project Management Institute
PMP	Probable Maximum Precipitation
POF	planned outage factor
PSSE	Power System Simulator for Engineering

Rey Hokenson is MWH's day-to-day contact and is the project manager (PM) for this assignment.

1.2.2 Project Schedule

The Project Milestone Schedule for the preparation and award of the numerous contracts that will be prepared by Nalcor and the Engineering, Procurement, and Construction Management (EPCM) Consultant is given in Appendix A. The IE's Execution Plan has been tailored to accommodate the Project Milestone Schedule.

1.3 PROJECT DESCRIPTION

The history of the LCP dates to the early 20th century when it was envisioned that a series of hydroelectric projects would be developed on the Hamilton River (now the Churchill River). During the mid-1960s an earnest effort was made to plan for the development of this valuable resource when Labrador and Newfoundland were in need of power. At that time electricity demand was growing by more than 10 percent per year. The plan was to construct the first project, Churchill Falls, on the Churchill River upstream of the LCP for supplying power to Newfoundland Island in 1972, and then to construct the LCP following completion of the 5,428 MW Churchill Falls Generating Station. The Churchill Falls Project commissioned its first unit in 1971 to feed power to Newfoundland. The Churchill Falls Project provides about 65 percent of the power available from the Churchill River, with the remaining 35 percent coming from two proposed power stations, Gull Island and Muskrat Falls. Muskrat Falls has been sized to provide 824 MW, while Gull Island has been sized to provide 2250 MW.

The first phase of the LCP includes the Muskrat Falls Generation facility, the Labrador Transmission Assets and the Labrador Island Link. The subsections following this general description more fully describe the LCP features and the full description of components of the project is found in Appendix E.

Phase I development also provides for construction by Emera, a large energy and service company based in the northeastern United States and Canada, of a new maritime transmission link between Newfoundland and Nova Scotia employing two 180-kilometer (km)-long subsea cables that allows LCP power to be used in Nova Scotia. The Emera project is not intended to be included in this review by the IE; it is covered in a separate IER. The second phase of the LCP is construction of Gull Island.

1.3.1 Muskrat Falls Generating Station

The Muskrat Falls Generating Station (MFGS) consists of several primary components: a powerhouse with an integral intake structure; a vertical-gated auxiliary spillway; an overflow service spillway fitted to the north roller compacted concrete (RCC) dam; a south rock-fill embankment dam; a project switchyard; and protective works located in the left abutment (North Spur) to control seepage. The MFGS will be serviced by a new 21-km access road that

connects the project to Highway 510, south of the Churchill River bridge crossing and by a road that connects the north abutment area to Highway 500, Trans-Labrador Highway to Churchill Falls. The powerhouse substructure is reinforced concrete with a structural steel superstructure. The reinforced concrete intake structure, integral with the powerhouse, will be fitted with three service gates and three bulkhead gates, located upstream of the service gates, for each of the four intake bays. The installed capacity of the powerhouse will be 824 MW with each of the four generating units rated at 229 megavolt amperes (MVA) with a 0.9 Power Factor at 39 meters net head.

The spillway consists of two components: (1) a reinforced concrete five-bay structure, fitted with 10.5-meter-wide by 22-meter-high vertical lift gates, and (2) a 425-meter-long, ogee-shaped overflow RCC spillway. The spillway sections acting in combination can pass the Probable Maximum Flood (PMF) of 25,060 cubic meters per second (cms) at El. 45.1. The overflow spillway is normally used to pass flows that exceed the powerhouse hydraulic capacity of 2,660 cms.

The protective works located in the left abutment include a slurry wall constructed to bedrock to control seepage from the reservoir and local groundwater, and include shoreline bank protection to prevent erosion from ice heave and abrasion, and wind-induced waves.

The Muskrat Falls powerhouse and switchyard will be connected to the Trans-Labrador Highway by an access road located on the south side of the Churchill River (Appendix F).

1.3.2 Labrador Transmission Assets Project

Near the powerhouse, the Muskrat Falls switchyard will be constructed to transmit power via four 315 kV HVac overhead transmission lines to the 350 kV HVdc converter station, two feeders will be connected to the converter transformers, and two feeders will connect to the filters. These lines are part of the Labrador Transmission Assets Project (LTAP). Each of these lines is to have a capacity of 900 MW (Appendix G).

The Muskrat Falls switchyard will also connect to the Churchill Falls switchyard that will be extended to accommodate the interconnection from Muskrat Falls to Gull Island. Two 315 kV HVac lines between Muskrat Falls and Churchill Falls will be used. Again, each line will have the capacity of 900 MW that will allow the Muskrat Fall power station entire plant load to be transmitted on one line. The lines will be carried on lattice steel towers with self-supported angles and dead-ends and with guyed suspension towers. One transmission line shall have one OPGW and the second shall have two OHGW.

1.3.3 Labrador Island Link Project

The Labrador Island Link Project (LIL) will consist of a converter station located at Muskrat Falls, a transmission link from Muskrat Falls switchyard to the SOBI, a transition station at the Labrador side of the SOBI from the transmission line to a submarine cable, a submarine cable

under the SOBI, a transition station on the Newfoundland side of the SOBI from the submarine cable to an overhead transmission line, a transmission line from the SOBI to Soldiers Pond, and a converter terminal station located at Soldiers Pond, west of St. John's. The transition station (compound) at Shoal Cove will include provision for the submarine cable termination system and associated switching equipment. Also included will be control, protection, and monitoring and communication equipment (Appendix G).

The converter stations at Muskrat Falls and Soldiers Pond will be designed as automated, remotely controlled facilities. The direct current (DC) system will be a point-to-point +/- 350 kV Line Commutated Converter (LCC) bi-pole from Muskrat Falls to Soldiers Pond. During a converter pole outage, the HVdc system will immediately and automatically reconfigure to operate as a monopole, with a metallic return without interruption to the service using shoreline pond electrodes installed at L'Anse au Diable in Labrador and Dowden's Point on the east side of Conception Bay.

This project also includes a 350 kV HVdc, 900 MW submarine cable system that will extend from Forteau Point, Labrador to Shoal Cove, Newfoundland across the SOBI. The offshore component will consist of three submarine HVdc mass-impregnated (MI) cables; one of the cables will be used as a spare. Each of the cables will be installed on the seafloor with approximately 150 meters of separation and all within a 500 meter wide by 34 km long corridor. Each of the cables will carry 450 MW with a rated capacity of 100 percent overload for 10 minutes and 50 percent overload for continuous operation. The water depth along the subsea transmission corridor varies between 60 meters to 120 meters. The cables will be protected along the length by a rock berm and the route was selected to avoid iceberg contact. The undersea cables will extend through steel pipe encasements in bored holes to protect the cables in the heavy ice and surf zones. The cables will be trenched underground to a depth of about 2 meters to two transition compounds that will be located approximately 1 km from the land entry locations. The transition compounds contain the cable terminations, switch gear and transition to the overhead line transmission system.

A shoreline pond electrode system will be located on the Labrador side of the SOBI. A shoreline pond electrode system will be located on the east side of Conception Bay near Soldiers Pond; the electrode line is 10 km long from Soldiers Pond to Conception Bay. The electrode ponds allow the transmission system to operate as a monopole system if one of the conductors is not functioning.

The switchyard at Soldiers Pond will interconnect eight 230 kV HVac transmission lines (four existing transmission lines looped in), and the synchronous condensers and the Soldiers Pond Converter Station. The upgrade at Soldiers Pond will include three new 175 megavolt ampere reactive (MVAR) high-inertia synchronous condensers, 230 kV and 138 kV circuit breaker replacements, and replacement of conductors and reconstruction of eight transmission lines entering and leaving the switchyard.

Information pertaining to the Maritime Link Transmission Project to be constructed and financed by Emera will be found in a separate report prepared for the Government responsible for its financing.

1.4 REVIEW OF CONSTRUCTION PROGRESS

Currently there are only two major construction contracts under way. The contract dealing with the southerly access road is completed. Of about 21 km of access road to be built, MWH understands that it is also completed. Additionally, the Bulk Excavation Contract has has reached 95 percent. The first scheduled excavation blast occurred during early February 2013.

Table 3-1

FIRM ENERGY AND POWER AND

AVERAGE ANNUAL ENERGY AND POWER

PROJECT	STUDY	FIRM ENERGY (TWH/YEAR)	FIRM POWER (MWc)	AVERAGE ANNUAL ENERGY (TWH[1]/YEAR)	AVERAGE ANNUAL POWER (MWc[2])
MUSKRAT FALLS	2012	[redacted]	[redacted]	[redacted]	[redacted]
	2013 GOVERNMENT REQUESTED STUDY	[redacted]	[redacted]	[redacted]	[redacted]
	GOVERNMENT REQUESTED STUDY RESTRAINT REMOVAL	[redacted]	[redacted]	[redacted]	[redacted]

NOTES:
1. TWH is terra-watt hours or $1x10^{12}$ watts (or $1x10^{9}$ kilowatts).
2. MWc is megawatts continuous.

The results of the power generation studies also confirm that the development of the Muskrat Falls project does not noticeably affect Churchill Falls output, and that banking of power is an efficient means to near-optimize the resources of the Churchill River which assumes a five-year banking period is adopted. A table summarizing these comments is also given in the August 2012 Power Generation Study prepared by Hatch.

3.2.3.1 [redacted]

[redacted]

[redacted]

3.2.4 Diversion Flood Assumed for Construction and Ice Affects

To enable cofferdam heights to be determined, Nalcor selected a return period flood of 20-years recurrence interval. Normally for larger projects where excavations are open for about one year while concrete is being placed, a 20-year to 25-year recurrence interval is selected as the minimum value for which the contractor must provide protection. Risks associated with floods with recurrence levels higher than this value are then either assigned to the Owner as their responsibility or to the contractor depending on contract language. For embankment structures, usually a longer period than 20-year return period for important structures is prescribed. For construction that takes longer than one year of cofferdam use, recurrence intervals of longer period are prescribed and costs of increased cofferdam sizes are paid for by the Owner. Determination of the value to use should be based on economics, balancing the cost of higher and larger cofferdams with the loss or damage of the structures being constructed and the cofferdam, cofferdam rebuilding, clean-up costs, environmental mitigation costs and fines, and lengthening of the contract schedule which delays power production, and higher interest during construction payments on construction loans. Once the recurrence interval is selected, the water surface elevation is determined from hydraulic studies associated with the construction flood discharge, and the freeboard (elevation distance between the flood level and cofferdam crest) is determined to establish the crest elevation of the cofferdam.

In the case of Muskrat Falls, another important consideration was required since ice jams are known to occur almost every year downstream of the dam and power station complex site. Historically data is available that allows a determination of water level flood elevation that occurs during an ice jam. Selecting the elevation that corresponds to a recurrence interval of 40-years for an ice jam event was then determined and compared to the elevation established from a 20-year return period flood; in this case, the ice jam elevation controlled the design of the RCC cofferdam (No.3) and establishes its height.

3.3 EXPECTED PERFORMANCE OF MAJOR SYSTEMS

Based on our current understanding of the LCP and Nalcor's contracting philosophy, which we have observed in reviewing the RFPs and the Contracts reviewed to date (November 2013), only tier-one fabricators, suppliers and installers of equipment and systems, along with tier-one contractors are being solicited to propose on the work. Tier one companies are assumed to be top-level and among the largest and most well-known companies of their type and are among the most important members of a supply chain to supply to an original equipment manufacturer. This philosophy in turn generates competitive responses from these firms who supply the utility-grade equipment required of the specifications. This equipment and systems meet, in our opinion, the intent of the contract's quality requirements and the technical conditions. We,

therefore, are currently of the opinion, and with our monitoring of the work during Phase II and thereafter, expect that the performance of major systems and sub-systems will be satisfactory.

3.4 MAJOR SYSTEMS COMPATIBILITY AND COMPLETENESS

We currently (November 2013) have only three contracts available to form a preliminary opinion pertaining to the compatibility of major systems and completeness. These contracts are as follows: CH0030, LC-SB-003, and CH0007.

Contract CH0030 involving the turbines, generators, and associated controls for this equipment is being provided by Andritz Hydro, a tier-one company. Andritz has provided numerous equipment packages for major hydro projects like this, and several recent ones that MWH has direct knowledge of, being the Owner's Engineer. Based on what has been reviewed to date, without viewing the fabrication, assembly, installation, and start-up and testing, we expect that the hydro-generating package will perform as designed and expected. Since the responsibility of the system compatibility and completeness lies with Andritz, following the technical provisions of the contract documents, we expect this package will be satisfactory.

Contract LC-SB-003 involving the Engineering, Procurement, and Construction (EPC) form of contract delivery for the submarine cable(s), which is directly managed by Nalcor is being provided by one of the three leading designers, fabricators, and installers of submarine cables, Nexans Cable. Based on information known to MWH, Nexans has completed many subsea cable projects, which are judged to be more difficult than the SOBI cable crossing. Therefore, MWH is of the current opinion that their system will be compatible with the land-based transmission systems and their system, and in itself will perform satisfactorily and will be completed, as specified.

Contract CH0007, involving the construction of Intake and Powerhouse, Spillway and Transition Dams, will be performed by Astaldi Canada Inc., based in Toronto. Astaldi's parent company is based in Italy and they have offices in the United States, Latin America, and the Middle East. MWH has direct working experience with Astaldi's Latin America company as Owner's Engineer on much smaller hydroelectric projects with less severe weather conditions than prevailing conditions at Muskrat Falls. All contractors will require Nalcor management oversight.

3.5 OPERATING HISTORY OF MAJOR EQUIPMENT

The following Table 3-2 lists major equipment that the IE has reviewed or will review during the Phase I work and comments germane to its operating history.

The EPCM Agreement provides for the following protection of Nalcor:

1. A Parent Company Guarantee
2. A Letter of Credit equal to 5 percent of the Agreement Price [redacted]
3. Professional Errors and Omissions Liability Insurance [redacted]
4. Commercial Liability Insurance [redacted]
5. Project-specific Commercial General Liability Insurance [redacted]
6. Automobile Liability Insurance [redacted]
7. Any Reconstruction Costs incurred by Nalcor [redacted]

SNC-L's Limit of Liability was fixed at 16 percent of the Agreement Price (Section 27.2), or [redacted]

When a change is required, as ordered by Nalcor, SNC-L has 14 days to respond to the request and is required to furnish a budget and schedule.

The compensation for changes entitles SNC-L to obtain additional compensation for reimbursable costs and additional fixed fees incurred in relation to the Change Order or Change Request. Changed conditions are clearly detailed in Section 23 of the EPCM Agreement, in MWH's opinion.

4.1.4 Communication and Interface Requirements

The EPCM Agreement provides throughout the text in different sections, information pertaining to how the parties will be communicating. Several of these sections are discussed hereafter.

Section 11 allows for Nalcor to conduct performance reviews of SNC-L's work periodically. Nalcor decides if a Performance Report is required and is delivered after the review has been completed. The Performance Report would describe any actions that Nalcor directs to remedy any failure in the performance of the Services that is apparent from the review. SNC-L is required to comply and remedy the issues found.

Section 31 discusses Public Communications and the constraints placed on SNC-L regarding communicating project information to the public without the written consent of Nalcor. SNC-L is restricted from addressing any media questions, and must revert to Nalcor for any communications that would take place.

Section 32 clearly spells out, in MWH's opinion, the requirement of the parties regarding how they communicate with each other as to the following when giving a notice (communication): it must be written; it must be addressed to Representative for the Party to whom the notice is addressed; when issued by Nalcor, it must be signed or authorized by a company representative, a director or company secretary, or duly authorized representative; where given by SNC-L, it must be signed or authorized by SNC-L's Representative, a director or company

Table 4-1 (cont'd)

CONTRACT CH0007

CONSTRUCTION OF INTAKE & POWERHOUSE, SPILLWAY & TRANSITION DAMS

ITEM NO.	DESCRIPTION	OBSERVATIONS; SOURCE IN CONTRACT	REMARKS; QUESTIONS?	OPINION OF INDEPENDENT ENGINEER
			RESPONSES FROM TIER ONE CONTRACTORS BY REMOVING PROVISION OF PERFORMANCE BONDS AND LIMIT LC TO 10%. THE FINAL LC/BOND IS [redacted]; ABOUT 25% OF CONTRACT VALUE. NALCOR HAS FOLLOWED A DETAILED RISK ASSESSMENT INVOLVING FINANCIAL ADVISORS, INSURANCE SPECIALISTS, AND LEGAL COUNSEL TO ARRIVE AT A BEST VALUE FOR PROJECT SECURITY. THEY ARE CONFIDENT THEY HAVE PROVIDED SUB-STANTIATION OF THEIR WORK. BASED ON NALCOR'S ASSESSMENT, MWH BELIEVES THIS TO BE A REASONABLE DECISION AS TO THE VALUES THAT ARE USED IN THE CONTRACT. MWH HAS RECOMMENDED THAT NALCOR	

released later during 2013 and early 2014 after Financial Close unless waived by Government, there are "gaps" in this document that will be required to be completed after Financial Close.

4.4 TURBINES & GENERATORS DESIGN, SUPPLY AND INSTALL AGREEMENT – CH0030

Contract CH0030 was awarded on December 31, 2012, and is scheduled to be substantially complete by March 23, 2017, when commissioning the Muskrat Falls Powerhouse is planned to occur. The contract was awarded to Andritz Hydro Canada Inc. whose parent company, Andritz Hydro is an internationally known, tier-one company that supplies hydrogenerating equipment. Most of the components for the turbine will be fabricated and assembled in China at companies that Andritz Hydro has an interest in and which are able to use the technologies developed by Andritz in their design, manufacturing, and assembly processes.

Table 4-2

CONTRACT CH0030

TURBINES & GENERATORS DESIGN, SUPPLY AND INSTALL AGREEMENT

ITEM NO.	DESCRIPTION	OBSERVATIONS; SOURCE IN CONTRACT	REMARKS; QUESTIONS?	OPINION OF INDEPENDENT ENGINEER
1	QUALIFICATIONS OF CONTRACTOR	ANDRITZ HYDRO CANADA INC., REGISTERED IN NEW BRUNSWICK, AND ITS PARENT COMPANY, ANDRITZ, IS A TIER-ONE SUPPLIER OF TURBINES AND ASSOCIATED EQUIPMENT		SATISFACTORY
2	QUALIFICATIONS OF SUBCONTRACTORS	ALMOST ALL OF THE SUB-CONTRACTORS AND SUB-SUPPLIERS ARE UNKNOWN TO MWH AND FOR THE TURBINES WHICH WILL BE MANUFACTURED IN TIANBAO, CHINA. ABB WILL	IT IS NOT CLEAR WHERE THE GENERATORS WILL FIRST BE ASSEMBLED AND TESTED TO ENSURE THAT ALL COMPONENTS WILL BE READY FOR ASSEMBLY IN THE FIELD; WE	ANDRITZ IS A SATISFACTORY CONTRACTOR. HOWEVER, MWH IS UNABLE TO OPINE ON THE SUB-CONTRACTORS BEING USED TO SUPPLY THE MAJOR COMPONENTS OF

Table 4-3 (cont'd)

CONTRACT LC-SB-003

STRAIT OF BELLE ISLE SUBMARINE CABLE DESIGN, SUPPLY AND INSTALL

ITEM NO.	DESCRIPTION	OBSERVATIONS; SOURCE IN CONTRACT	REMARKS; QUESTIONS?	OPINION OF INDEPENDENT ENGINEER
9	CONFORMS TO INDUSTRY STANDARDS	CONTRACT APPEARS TO BE GENERALLY COMPLETE		SATISFACTORY
10	COMPENSATION TERMS	PART 2, EXHIBIT 2 COVERS COMPENSATION	THE BREAKDOWN OF ITEMS AND THE UNITS OF MEASURE APPEAR TO BE ADEQUATE FOR THIS CONTRACT	SATISFACTORY
11	GUARANTEES & LIQUIDATED DAMAGES	LDS ARE GIVEN IN EXHIBIT 2, SECTION 7; REQUIRE [redacted] FOR MISSING MILESTONE GIVEN IN SECTION 4 AND EXHIBIT 11-MILESTONE SCHEDULE	NALCOR ADVISED THE BARGE STANDBY RATE OF [redacted] WAS USED FOR DELAYS. THE RATE WILL BE ASSESSED AS A PORTION OF A DAY TO THE NEAREST HOUR.	SATISFACTORY
12	PERFORMANCE BOND, LDS, BONUS, BUYDOWN/OUT	PERFORMANCE BOND COVERED IN ARTICLE 7 AMOUNTING TO 50% OF THE CONTRACT PRICE; LC OF 15% OF CONTRACT PRICE	NO COMPANY GUARANTEE WAS REQUIRED	SATISFACTORY

Table 4-4 (cont'd)

SUMMARY OF GUARANTEES AND LIQUIDATED DAMAGES (LDs)

ITEM NO.	CONTRACT OR RFP NO.	ITEM NOs. IN TABLES	OBSERVATIONS	REMARKS; QUESTIONS	OPINION OF INDEPENDENT ENGINEER
		13	NO PERFORMANCE BOND OR PAYMENT BOND REQUIRED	IE REQUIRES CLARIFICATION FROM NALCOR AS TO WHAT PERFORMANCE SECURITY EXISTS OTHER THAN HOLDBACK PERCENTAGE OF PAYMENTS. NO IE OPINION UNTIL MWH RECEIVES NOTICE FROM NALCOR THAT NO BONDS WILL BE NECESSARY AT PROJECT CLOSING. WE CURRENTLY UNDERSTAND NO BONDS WILL BE REQUIRED BY NALCOR. [redacted]	SATISFACTORY
		15	NOT APPLICABLE		NOT APPLICABLE
2	CH0007 (MF) RFP	6	LC AND PAYMENT BOND JUDGED TO BE TOO SMALL; WARRANTY OF WORK FOR THREE YEARS PARENTAL GUARANTEE IS REQUIRED	NALCOR IS REVIEWING ALL PROVISIONS FOR LCS, GUARANTEES, WARRANTIES, PAYMENT AND PERFORMANCE BONDS.	SATISFACTORY

Table 4-4 (cont'd)

SUMMARY OF GUARANTEES AND LIQUIDATED DAMAGES (LDs)

ITEM NO.	CONTRACT OR RFP NO.	ITEM NOs. IN TABLES	OBSERVATIONS	REMARKS; QUESTIONS	OPINION OF INDEPENDENT ENGINEER
		12	LDS RANGING FROM [redacted] FOR MISSED MILESTONES ARE GIVEN IN PART 2, EXHIBIT 2, SECTION 13 LDS PERSONNEL PERFORMANCE INCENTIVES ARE ALSO GIVEN IN SECTION 12.2 [redacted]	EXAMPLES OF HOW LDS ARE COMPUTED ARE REQUIRED BY THE IE; THESE WERE FURNISHED BY NALCOR. IE REQUIRES FINAL LDS AS GIVEN IN CONTRACT. NALCOR PROVIDED INFORMATION.	SATISFACTORY
		13	SEE 12 DIRECTLY ABOVE FOR [redacted] DECISIONS ON PERFORMANCE BONDS AND LDS DISCUSSED IN 6 ABOVE	NALCOR REQUIRED TO MAKE DECISIONS REGARDING THESE ISSUES. NALCOR PROVIDED INFORMATION.	SATISFACTORY
		15	NOT APPLICABLE		NO OPINION REQUIRED
3	CH0030 (MF) CONTRACT	6	GUARANTEES ARE DISCUSSED IN EXHIBIT 1, APPENDIX B AND IN THE TECHNICAL SPECIFICATIONS IN SECTION 2.3 WARRANTIES ARE DISCUSSED IN THE TECHNICAL SPECIFICATIONS UNDER 2.4	TYPICAL GUARANTEES AND WARRANTEES ARE PROVIDED. DIMENSIONABLE STABILITY AND CRACKING ARE ALSO COVERED.	SATISFACTORY

Table 4-4 (cont'd)

SUMMARY OF GUARANTEES AND LIQUIDATED DAMAGES (LDs)

ITEM NO.	CONTRACT OR RFP NO.	ITEM NOs. IN TABLES	OBSERVATIONS	REMARKS; QUESTIONS	OPINION OF INDEPENDENT ENGINEER
1	LC-SB-003 (LIL)	6	NO GUARANTEES 36 MONTH WARRANTY		SATISFACTORY
		12	[redacted]		SATISFACTORY
		13	[redacted] CONTRACT PRICE PERFORMANCE BOND; LC OF [redacted] CONTRACT PRICE	NO COMPANY GUARANTEE WAS REQUIRED	SATISFACTORY
		15	NO GUARANTEES 36 MONTH WARANTY		SATISFACTORY

4.11 CONSTRUCTION SCHEDULE

The IE has reviewed the Integrated Project Schedule (IPS) (Rev B3, dated 27 July 2013) that provides the timeline for completion of the MFG, LTA and LITL projects' components. A copy of the Rev B3 version of the IPS is attached in Appendix J.

4.12 SCHEDULE ACHIEVABILITY

To account for uncertainty in the project's schedule opinion, stakeholders should be aware that a range of probable outcomes is possible. The IE has extensive global experience with hydro-power projects of this scale. Similar projects have taken approximately five to seven (5-7) years to complete. Nalcor's estimated 5.25-year build-out and commissioning period is observed to be within that range. While there is probability that the projects' schedule objectives, as defined by Nalcor can be achieved, there is also reportable probability that the target in-service dates will remain under pressure for protraction as field execution challenges are encountered.

4.13 SCHEDULE RISK DISCUSSION

Nalcor carried out a Schedule Risk Analysis at DG3 and identified weather risk and volume of work to be carried out in the powerhouse as being the main risks. Subsequent to that, Nalcor has reviewed the Risk analysis carried out at DG3 which identified the risks that Nalcor needed to mitigate in order to reduce the schedule risk identified at that time. The weather risk has been mitigated by a "mega dome" that the contractor for contract CH0007 will erect to enclose the powerhouse structure which will provide a controlled climate for the concrete to be poured year round. This directly addresses a significant component of the weather risk identified at DG3 and the volume of concrete that can be placed year round. This avoids a slowdown in winter and levelizes the workforce year round.

Table 5-1

DG3 CAPITAL COST ESTIMATE SUMMARY

MF		
Description	**Code**	**Budget (DG3)**
Owner, admin and EPCM	100	[redacted]
Feasibility engineering	200	[redacted]
Environmental and regulatory compliance	300	[redacted]
Aboriginal Affairs	400	[redacted]
Procurement and Construction	500	[redacted]
Commercial and Legal	900	[redacted]
Contingency	990	[redacted]
	Grand Total	**2,901,158,288**

LITL		
Description	**Code**	**Budget (DG3)**
Owner, admin and EPCM	100	[redacted]
Feasibility engineering	200	[redacted]
Environmental and regulatory compliance	300	[redacted]
Aboriginal Affairs	400	[redacted]
Procurement and Construction	500	[redacted]
Commercial and Legal	900	[redacted]
Contingency	990	[redacted]
	Grand Total	**2,609,748,892**

TABLE 5-1 (cont'd)

DG3 CAPITAL COST ESTIMATE SUMMARY

LTA		
Description	**Code**	**Budget (DG3)**
Owner, admin and EPCM	100	[redacted]
Feasibility engineering	200	[redacted]
Environmental and regulatory compliance	300	[redacted]
Aboriginal Affairs	400	[redacted]
Procurement and Construction	500	[redacted]
Commercial and Legal	900	[redacted]
Contingency	990	[redacted]
	Grand Total	**691,582,486**

LCP		
Description	**Code**	**Budget (DG3)**
Owner, admin and EPCM	100	[redacted]
Feasibility engineering	200	[redacted]
Environmental and regulatory compliance	300	[redacted]
Aboriginal Affairs	400	[redacted]
Procurement and Construction	500	[redacted]
Commercial and Legal	900	[redacted]
Contingency	990	[redacted]
	Grand Total	**6,202,489,666**

Table 5-2

EXPENDITURES TO DATE VERSUS THE DG3 CAPITAL COST ESTIMATE

Description	Amount ($CDN)	Metric
Awarded Work to Date	$2,401,387,000	44% of total original budget less Program costs ($5.52B)
Net Variance on Awarded Work to Date Relative to DG3	[redacted]	[redacted]
Soon to be Awarded Work (within +2 Quarters)	$1,797,221,000	33% of total original budget less Program costs ($5.52B)
Estimated Net Variance on Soon to be Awarded Work	[redacted]	[redacted]
Overall Net Variance on Awarded and Soon to be Awarded Work Relative to DG3	[redacted]	[redacted]
Overall Positive to Negative Variance on Awarded and Soon to be Awarded Work Relative to DG3	[redacted]	[redacted]
Unreconciled Work	[redacted]	[redacted]
Contingency Reduction Post DG3	[redacted]	[redacted]
Remainder Contingency	[redacted]	[redacted]
Contingent Equity Provision for Overruns	Undefined	n/a

These data indicate the awarded work has experienced a [redacted] percent positive variance from the DG3 cost estimate. Overall, the analysis indicates a combined [redacted] percent positive estimating variance for the awarded and soon-to-be awarded work based on information recently provided by Nalcor. The IE is of the opinion that the estimating variance will continue to trend downwards for the remainder of the un-awarded work and project support costs. Since the revised budget projection put forward by Nalcor does not factor in an allowance for estimating variance, the IE suggests that Nalcor consider applying an appropriate management reserve to accommodate future changes in project scope and cost.

5.1.3 Contingency Analysis

While Nalcor adopted a theoretical P50 contingency based on analytical modeling (i.e., range uncertainty) of the project's sub-element summary budgets, the IE is of the opinion that the calculated overall 6.7 percent scope contingency is aggressive relative to our legacy experience with similar remote heavy-civil construction endeavors. The IE understands that the Province will provide contingent equity for any budget shortfalls past the $6.3B FLG. The contingent equity is currently undefined.

As the project moves into full-scale field execution with the award of CH0007 (Muskrat Falls Powerhouse), the IE would advocate for adjustment of the project contingency fund. [redacted] The IE believes the drivers on contingency will be varied and not entirely predictable as the project unfolds over the next several years. Issues associated with budget estimate accuracy, baseline schedule accuracy, uncompetitive market conditions, directed scope changes, changed field conditions, claims, weather impacts, resource shortages, directed schedule acceleration, potential contractor defaults, incremental owner project support costs, and other unknown risks are some of the typical factors that our experience indicates will consume contingency on a remote large-scale, heavy-civil endeavor.

5.1.4 Cost Escalation

Estimated capital costs included in the DG3 estimate are costs based on 2012 values. These values were escalated in the Nalcor financial models to reflect expected cost bases in the years of construction.

The long duration of the development, construction, and operation phases of the LCP subject project costs to escalation caused by inflation and various other factors, including changes in market conditions, labor rates, productivity, etc.

As shown in Table 5-1, above, the DG3 capital cost estimates have been adjusted to reflect cost escalation and contingency allowances. The Nalcor financial models also incorporate cost escalation and contingencies as separate line items. The capital costs projected and input into the financial models also incorporate escalation in addition to contingency, which addresses separately risks of a different nature. With the assistance of external experts, Nalcor has projected cost escalation that takes into account how each sector of the economy, e.g. commodity, labor market or global economic factors, is impacted differently. In our opinion, the strategy adopted by Nalcor permits a realistic estimate of escalation. Escalation assumptions input into the MF, LTA, and LIL spreadsheets in the financial models reflect the detailed estimates prepared, and appear consistent with the trends projected for the region. Table 5-3 summarizes the annual escalation through 2018.

parameters. Total aggregate contingency percentage is about 6 percent. These contingency values appear to be at the low end of the observed range which in our opinion is aggressive..

Table 5-4

CONTINGENCY ALLOWANCE

	MF	LTA	LIL	Total
Total DG3 Capital Cost Estimate	$2,901,158,288	$691,582,486	$2,609,748,892	$6,202,489,666
Growth allowance components				
P50 contingency	$ 226,800,000	$ 54,400,000	$ 86,600,000	$ 368,000,000
P50 contingency $ of Nalcor total capex	7.81%	7.92%	3.31%	5.93%

5.1.6 Indirect Costs

An important component capitalized into the LCP funding mechanisms is the cost of financing. This cost category includes bond counsel, financial advisory, underwriter discount, official statement printing and distribution, and other costs. Because of the very high credit worthiness of the financing securities, we are advised that there will be no cost of bond insurance premiums or surety costs.

Financing costs for the three projects included in the models total more than $16.90M, as follows:

MF .....[redacted]

LTA.....[redacted]

LIL .....[redacted]

Sum .....[redacted]

Other indirect costs included in the DG3 estimate include:

- project management;
- integrated commissioning;
- project vehicles / helicopter support;
- insurance / commercial;
- land acquisition and permits;
- quality surveillance and inspection;

- freight forwarding services; and
- environmental and aboriginal affairs.

In our opinion, the approach and the comprehensiveness of the technical estimates is consistent, and even better than those normally seen in projects of this type.

Financing fees, namely those for arrangement and commitment (LIL at [redacted] percent of amount financed, for example), are in the range typically seen in other similar projects.

5.1.7 Historical Capital Outlay

Capital costs that have occurred or shall have occurred prior to project financing are included in the DG3 estimate. Some utilities capitalize such costs in their main financing packages where some form of short-term "bridge financing" may have been used to pay for the initial construction activities. Such bridge financing securities are refinanced into the main financing structures. Other utilities fund the initial construction outlay using equity funds on-hand and do not re-capitalize those expenditures into the main financing vehicles.

Nalcor's DG3 cost estimate and financial planning models include more than $186M in pre-operating construction costs.

Table 5-5 summarizes these costs by project.

Table 5-5

HISTORICAL COSTS

PROJECT	HISTORICAL COST (note 1; note 2)
Muskrat Falls	$97,303,164
Labrador Transmission Assets	4,196,093
Labrador Island Transmission Link	85,307,165
Total	**$186,806,422**

Notes:
Note 1: Cost data in Table 5-5 are reported at original cost.
Note 2: Historical costs are those costs associated with the projects that have occurred before Project Sanction, December 17, 2012.

5.1.8 Interest During Construction

The DG3 construction cost estimate does not include costs of IDC, also called AFUDC. However, IDC is an important feature to capitalize in the financings and it is included in the Nalcor financial models. Table 5-6 summarizes the IDC values included for the three projects.

Table 5-6

INTEREST DURING CONSTRUCTION COST

PROJECT	IDC
MF	$364,522,428
LTA	$79,164,135
LIL	$558,444,313
TOTALS	**$1,002,130,876**

5.1.9 Renewals and Replacements

Nalcor advised the IE that the financial planning for the projects does did not specifically include costs for renewals and replacements in the capital or annual cost estimates. Their opinion is that with proper design and installation and with regular and prudent maintenance following manufacturers' recommended scheduled maintenance there should be no need to replace the equipment since its useful life will exceed the bond repayment period.

The IE is of the opinion, based on experience that funds should be provided for major replacements in the 25-30 year period with minor replacement after 10-15 years of service.

If major repairs/replacements become necessary, Nalcor will have access to Provincial equity funding to be repaid subsequently. This program is consistent with the manner of utilities that use the "Cash Needs" method of revenue requirements. The three step solution: (1) problem happens or will happen; (2) problem solution is funded; and (3) the funding is repaid, is optimized if the utility has a capital reserve or other liquidity feature to minimize the time taken in the funding step.

Although Renewals and Replacements are not included in either DG3 or the Nalcor financial models, Nalcor has included in its Asset Management Philosophy report the Renewals and Replacements data included here in Table 5-7.

Table 5-7

MAJOR MAINTENANCE ACTIVITIES PLANNING

Hydro Power Plant Major Maintenance Activity	Interval (years)	Activity Duration	Activity Cost
Replace bearings	Turbine 25-35 Generator 40-50 Thrust 40-50	4 days	[redacted]
Replace wicket gate bushing	25-50	1 month	[redacted]
Replace shaft seal	15-30	2 days	[redacted]
Clean rotor and stator	50-75	1 month	[redacted]
Repair cavitation	25-50	2 weeks	[redacted]
Replace generator cooler	35-50	1 week	[redacted]
Rewind generator	60-80	1.5 months	[redacted]
Replace exciter	15-20	5 weeks	[redacted]
Replace governor	15-20	5 weeks	[redacted]
Replace voltage regulator	15-20	5 weeks	[redacted]

5.1.10 PM, Construction Contractors Experience

At the present time, we only have knowledge of the EPCM contractor and three other contracting groups of the contracts the IE is required to review and report on. These entities are included in the following Table 5-8 with our remarks.

Table 5-8

CONTRACTOR'S EXPERIENCE

CONTRACT NO.	CONTRACT DESCRIPTION AND CONTRACTOR	REMARKS	OPINION OF INDEPENDENT ENGINEER
CH0006	BULK EXCAVATION HT O'CONNELL, EBJ, NIELSON, AND KIEWIT	EACH OF THE CONTRACTORS IS WELL-KNOWN IN CANADA AND HAS THE FULL CAPABILITIES TO PERFORM THE ENTIRE CONTRACT BY THEMSELVES. THE CONTRACTORS HAVE WORKED TOGETHER ON	SATISFACTORY

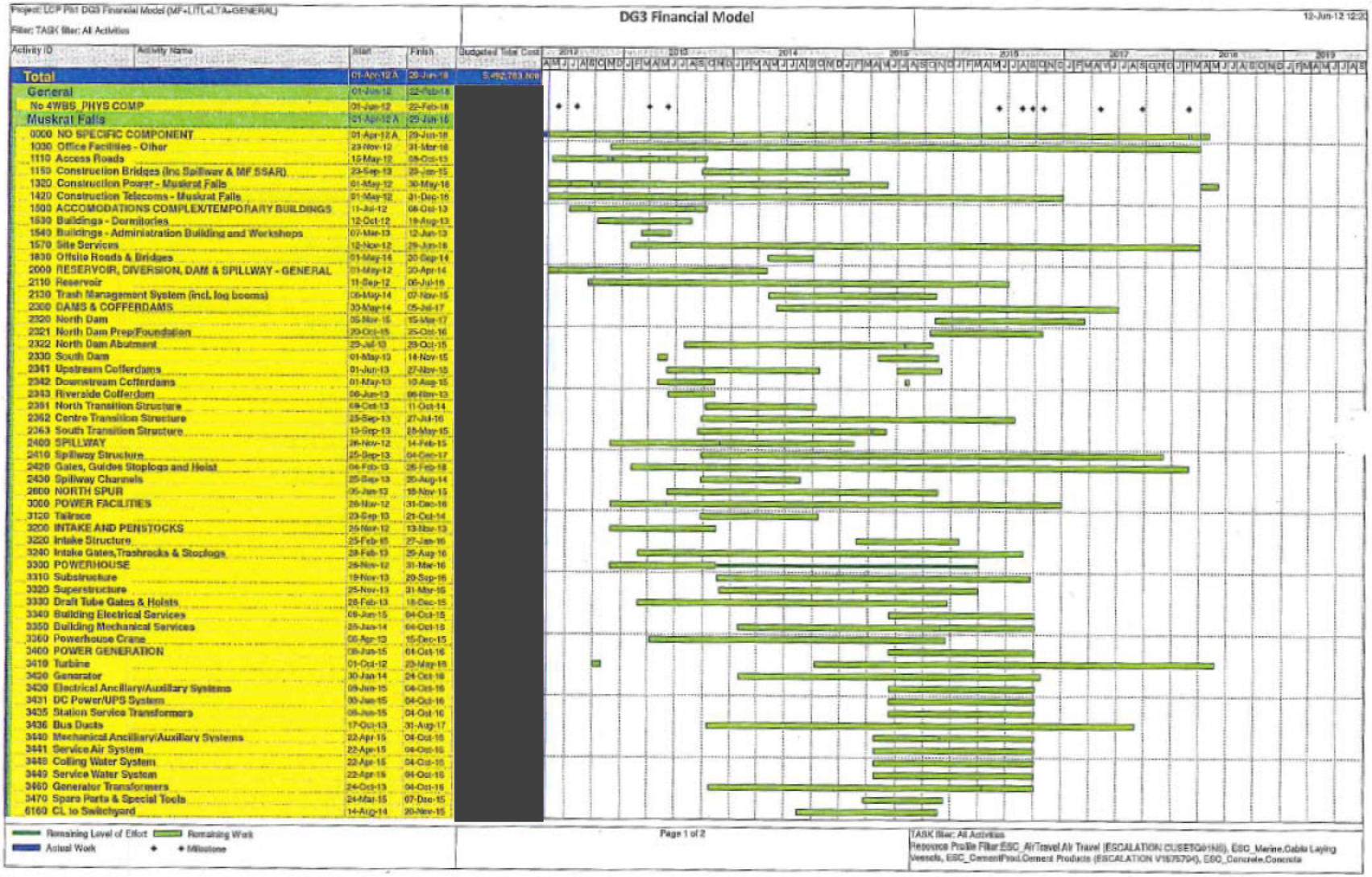


Figure 5-1 Schedule of Expenditures for Major Components of the Projects and Accumulated Cash Flow Projection

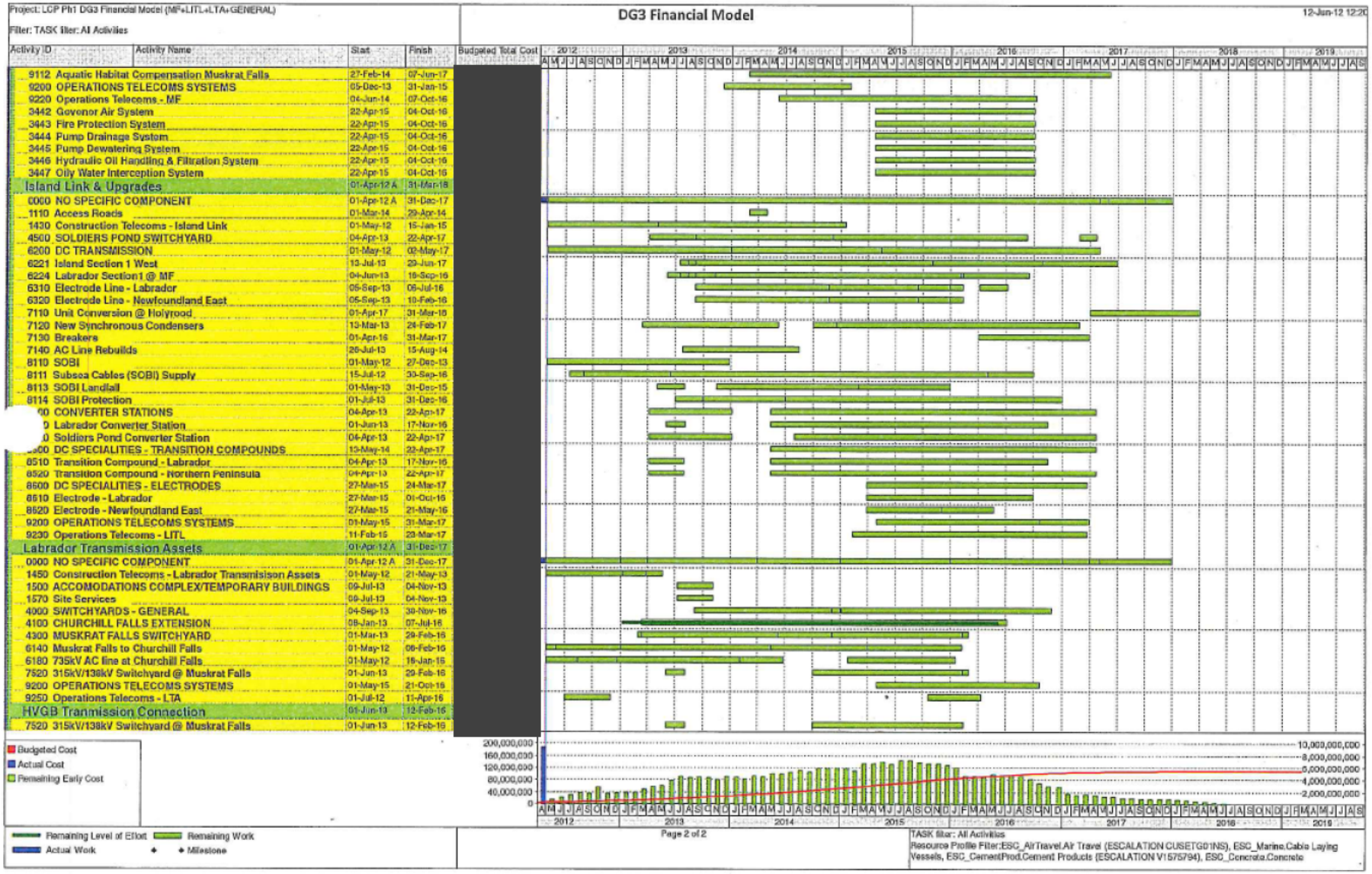


Figure 5-1 Schedule of Expenditures for Major Components of the Projects and Accumulated Cash Flow Projection (continued)

5.2.2 Allowance for Contractor Bonus

[redacted]

[redacted] the bonus provisions provide a reasonable incentive to the contractor to complete the milestones early. MWH believes that with the Integrated Project Team and close project monitoring and control, these bonus incentives will be beneficial to the Project.

[redacted]

5.2.3 Highlight Sensitive and Critical Areas

Nalcor has identified several areas that they initially believe are the critical risk areas for the projects, namely the following: Performance Risk and Schedule Risk. A brief discussion of each, from Nalcor's perspective, follows.

Performance risk is assumed to exist since Nalcor has used historical norms from legacy hydroelectric projects that were predicated on achieving an envisioned labor strategy and were even assumed to be more efficient in realizing productivity compared to a contemporary project where restrictive work practices exist. Nalcor is concerned that "…contractor mark-ups for unit price agreements could be excessive if there is a perception risk that the labor strategy will not materialize." The experienced front-line supervision, which is key to performance execution for the LCP has been correctly identified by Nalcor in MWH's opinion, now competes with other projects, world-wide, and could likely place a high demand on Churchill Falls.

Nalcor considered that there was a potential for a time or schedule risk exposure for the MF powerhouse beyond the plan they developed due to weather and the sheer magnitude of the volume of work for the powerhouse. The main concern was that the placement and curing of the 460,000 CM of powerhouse reinforced concrete over several winters will be a significant challenge for the contractor for CH0007. Additionally, the Bulk Excavation contractor (CH0006) needed to keep to schedule to complete its work this fall (2013) to enable the contractor for CH0007 to start its work on time, which was achieved.

MWH agrees with Nalcor's assessment that these are certainly risks that must be considered and accounted for in the schedule and cost estimate. MWH notes that the perceived schedule risk exposure pertaining to the Bulk Excavation contractor completing on time appears to be a non-issue, as viewed during the field trip in late September 2013, assuming that the contractor's performance continues to be satisfactory. Additionally, MWH believes that with Nalcor's acceptance of the contractor's proposal to use an all-weather enclosure for powerhouse construction as proposed by the contractor for CH0007 can work to mitigate the risk of extensive delays in the powerhouse concrete construction during the winter seasons.

With the concern that Nalcor has expressed in the past regarding uncertainties surrounding the potential cost increase due to the competition for labor and key personnel, MWH believes that this concern could have been addressed in the cost estimate and reflected in the Project

Schedule by including higher more customary contingencies and a lengthened project schedule. A larger Owner's contingency could have been assumed as compared to what Nalcor used to offset the risk of overrunning the project budget and communicated timeline. In the DG2 and DG3 estimates, MWH generally follows AACEI's guidelines for projects with respect to contingencies since AACEI has a broad data base to support the contingency values and accuracy statement used for each level of the cost estimate. In addition, the schedule opinion will gain accuracy if the project's risk register is mapped to the individual line item activities and supported with an analytical uncertainty analysis using Monte Carlo simulation to discern finish date accuracy relative to desired confidence intervals. Nalcor advises that even though there was an increase in DG3 by 5 percent with two-thirds of the Project at Class I estimate level, they believe they have mitigated the risk successfully and will complete their projects within their estimate.

5.2.4 Price Risks

Nalcor has discussed in the contracting philosophy their methods to quantity and manage price risks due to changing market conditions, inflation, labor issues, weather and hydrology issues, manufacturing space and equipment availability, delays in meeting milestones, and competition with other projects in Canadian Provinces. The risk assessments they conducted following a multi-faceted Project Risk Management Plan using AACEI's recommended practice for price changes for major equipment they will purchase, as well as the construction and installation contracts they and SNC-L will administer, appear to be carefully performed and were taken into consideration in their economic analysis. The CPM schedule was also integrated into the analysis to arrive at appropriate unit cost pricing.

Where appropriate, LDs, LCs and performance protection have also been used to protect Nalcor as well as bonus provisions [redacted] to help Nalcor achieve their development schedule.

5.3 DRAWDOWN SCHEDULES

In order to opine on the reasonableness of the drawdown schedules for each of the contracts that MWH is required to review and comment on, we have prepared Table 5-10 wherein we have summarized our findings for each of the contracts. We note that even where we believe we have observed some payments in favor of the contractor or vendor, since the payment schedule was considered among many items in the consideration and award of the contract, other issues may override any unbalance we may observe.

Table 5-10

PAYMENT SCHEDULES FOR CONTRACTS REVIEWED

BY THE INDEPENDENT ENGINEER

PROJECT	CONTRACT NUMBER	PAYMENT SCHEDULE		REMARKS/COMMENTS
		NORMAL EXPECTED	UNUSUAL	
MF	CH0030	Normal		Satisfactory
	CH0006	Normal		Satisfactory
	CH0007			Awaiting contract award and payment schedule
SOBI	LC-SB-003	Unknown		Under review

To allow a more easy comparison to determine if the drawdown payment schedule is normal or unusual, we have plotted each of the schedules we have been asked to review where information is available. A composite plot is given in Figure 5-2 below for contract CH0006, contract LC-SB-003, and contract CH0030, which has three currencies to consider. The plots indicate no unusual issues with drawdown payments.

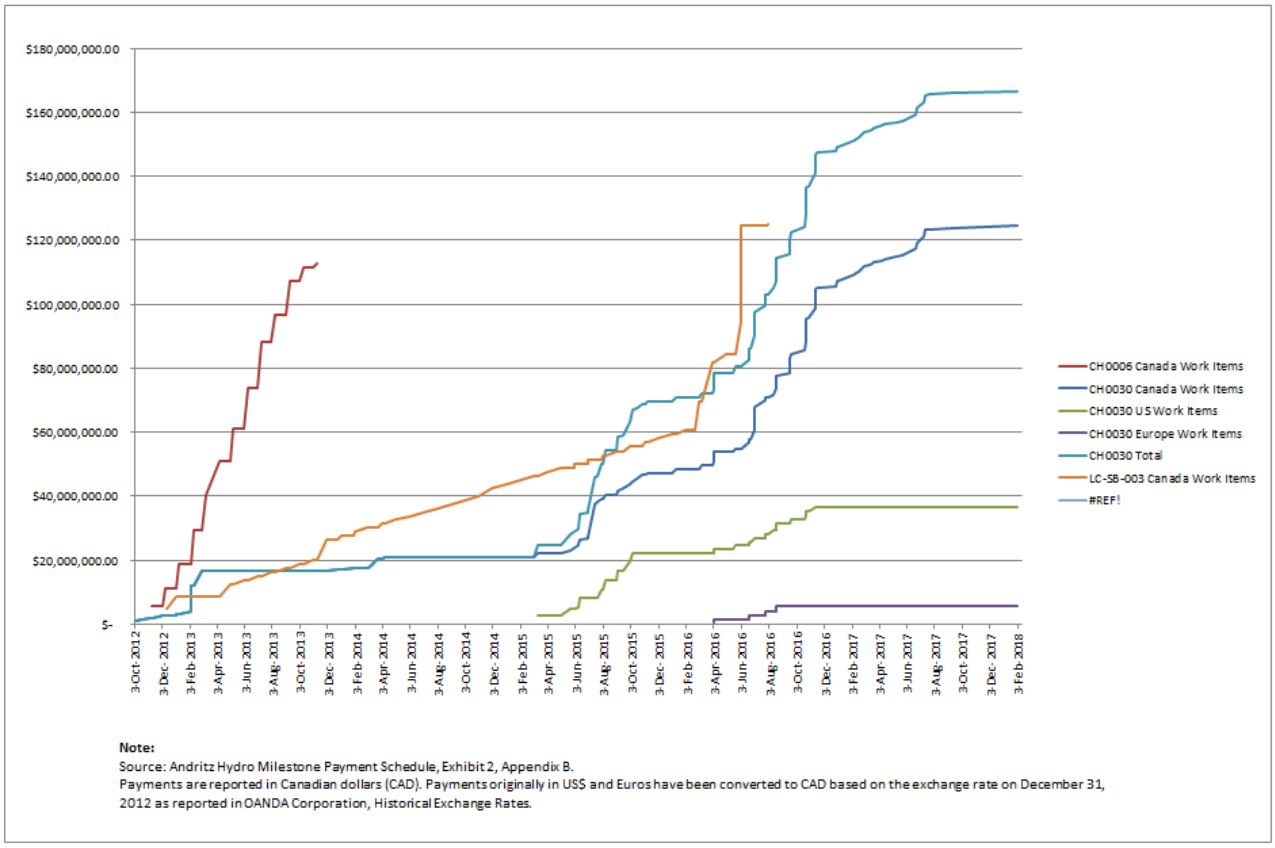


Figure 5-2 Composite Plot of Drawdown Payment Schedule –

Contract CH0006, Contract LC-SB-003, and Contract CH0030

Responses to our questions and comments on Permits, Fish Compensation Strategy, Draft Fish Habitat Compensation Plan, and Aquatic Environmental Effects Monitoring Program were provided by Nalcor. We acknowledge that our questions pertaining to these four subjects were satisfactorily answered by Nalcor and, in our opinion, conclude that the adopted approach is satisfactory.

8.3 FUNDING OF ENVIRONMENTAL STUDIES AND ADEQUACY OF BUDGET AMOUNT

8.3.1 Current Studies Funding

Table 8-2 contains the information available from Nalcor that lists budget funding for current environmental studies.

Table 8-2

CURRENT ENVIRONMENTAL STUDIES FUNDING MUSKRAT FALLS AND LABRADOR-ISLAND TRANSMISSION LINK

Control Account Description	Control Account	Budget Items	2013 Budget
Environmental Affairs - General Consultation	5.1.300.0000.0303.02.00	NE-LCP General	[redacted]
		Consultation Database	
		Environmental Affairs - General Consultation	
	5.1.300.0000.0303.02.00 Total		
Environmental Effects Monitoring	5.1.360.0000.0310.02.00	Both Gull Island and Muskrat Falls Generation	
		Aerial surveys of the river and surrounding locations for waterfowl and analyze temporal use of traditional ashkui sites.	
		Ambient air quality monitoring (AAQM) program	
		Caribou Program	
		Environmental Effects Monitoring	
		Mercury levels monitoring program	
		Nalcor will monitor and assess greenhouse gas fluxes as a result of LCP activities.	
		Nalcor will monitor ice conditions and issue public advisories on the condition of ice.	

Table 8-2 (cont'd)

CURRENT ENVIRONMENTAL STUDIES FUNDING MUSKRAT FALLS

AND LABRADOR-ISLAND TRANSMISSION LINK

Control Account Description	Control Account	Budget Items	2013 Budget
		Nalcor will monitor methylmercury levels in river otter feces.	
		Baseline methylmercury exposure program (HHRA)	
		Regionally uncommon terrestrial vegetation survey	
		Muskrat Falls – Generation	
		Comprehensive monitoring and follow-up program upon LCP start-up, employing an adaptive management process	
		Nalcor will access marten data for post-project trapping for analysis and comparison with pre-project trapping data.	
		Nalcor will re-deploy GPS/VHF collars on bears in the river valley.	
		Winter aerial and ground or GPS telemetry surveys of moose	
		Mud Lake Drinking Water Baseline Study	
		Labrador - Island Transmission Link	
		Access Impacts Monitoring Program	
		Environmental Effects Monitoring Program	
		Furbearer Baseline Study	
		Harlequin Duck Baseline	
		Rare Plant Survey & Planning	
	5.1.360.0000.0310.02.00 Total		
Environmental Management Expert Legal Advice	5.1.300.0000.0103.02.10	E&AA Management	
		Environmental Management Expert Legal Advice	
	5.1.300.0000.0103.02.10 Total		
General (Response to Project Modifications)	5.4.330.0000.0000.02.00	Labrador - Island Transmission Link	

Table 8-2 (cont'd)

CURRENT ENVIRONMENTAL STUDIES FUNDING MUSKRAT FALLS

AND LABRADOR-ISLAND TRANSMISSION LINK

Control Account Description	Control Account	Budget Items	2013 Budget
		General (Response to Project Modifications)	
		Labrador Woodland Caribou Recovery Team	
	5.4.330.0000.0000.02.00 Total		
LCP Aboriginal Agreements Consultation (Interpretation & Translation)	5.1.420.0000.0000.02.01	Aboriginal Affairs	
		LCP Aboriginal Agreements Consultation (Interpretation & Translation)	
		Continually engage Aboriginal groups throughout the construction and operation of the LCP.	
		Aboriginal Affairs consultation - Linked to Item #1	
	5.1.420.0000.0000.02.01 Total		
LCP Aboriginal Agreements General Planning & Strategic Support	5.1.420.0000.0000.02.12	IBA	
		EMC	
		LCP Aboriginal Agreements General Planning & Strategic Support	
		IBA Implementation Committee shared costs with Innu Nation	
	5.1.420.0000.0000.02.12 Total		
LCP Aboriginal Planning Expert Advice	5.1.420.0000.0000.02.11	Aboriginal Affairs	
		LCP Aboriginal Planning Expert Advice	
	5.1.420.0000.0000.02.11 Total		
LCP E&AA - Agreements with Other Aboriginal Groups	5.1.430.0000.0403.52.00	Aboriginal Affairs	
		LCP E&AA - Agreements with Other Aboriginal Groups	
	5.1.430.0000.0403.52.00 Total		

Table 8-2 (cont'd)

CURRENT ENVIRONMENTAL STUDIES FUNDING MUSKRAT FALLS

AND LABRADOR-ISLAND TRANSMISSION LINK

Control Account Description	Control Account	Budget Items	2013 Budget
LCP E&AA - Island Link Environmental Impact Statement (EIS) Response to Information Requests (IRs)	5.4.330.0000.0306.02.00	Labrador - Island Transmission Link	
		LCP E&AA - Island Link EIS Response to IR's	
	5.4.330.0000.0306.02.00 Total		
LCP E&AA - OAG Document Production	5.1.430.0000.0403.02.00	Aboriginal Affairs	
		LCP E&AA - OAG Document Production	
	5.1.430.0000.0403.02.00 Total		
LCP E&AA - OAG translation	5.1.430.0000.0403.02.01	Aboriginal Affairs	
		LCP E&AA - OAG translation	
	5.1.430.0000.0403.02.01 Total		
LCP E&AA - Project Commitments - Island Link Transmission	5.4.330.0000.0350.02.01	Labrador - Island Transmission Link	
		Caribou Considerations in Design	
		Environmental Effects Monitoring Program	
		LCP E&AA - Project Commitments - Island Link Transmission	
		Marine Fisheries Compensation Planning/Support	
		Rare Plant Mitigation Efforts	
		Socioeconomic Effects Monitoring Program	
	5.4.330.0000.0350.02.01 Total		
LCP E&AA Aboriginal Agreements Legal Support	5.1.400.0000.0103.02.00	IBA	
		EMC	
		LCP E&AA Aboriginal Agreements Legal Support	
	5.1.400.0000.0103.02.00 Total		

Table 8-2 (cont'd)

CURRENT ENVIRONMENTAL STUDIES FUNDING MUSKRAT FALLS

AND LABRADOR-ISLAND TRANSMISSION LINK

Control Account Description	Control Account	Budget Items	2013 Budget
LCP E&AA Generation Project Commitments (WQM, Research, EMS, etc.)	5.2.320.0000.0350.02.00	Both Gull Island and Muskrat Falls Generation	
		Caribou Program	
		Compensation program for flooded trap lines	
		LCP E&AA Generation Project Commitments (WQM, Research, EMS etc.)	
		RTWQM	
		Muskrat Falls – Generation	
		Nalcor will conduct an amphibian relocation program prior to reservoir filling.	
		Nalcor will re-deploy GPS/VHF collars on bears in the river valley.	
		Winter aerial and ground or GPS telemetry surveys of moose	
	5.2.320.0000.0350.02.00 Total		
LCP E&AA Generation Updates and Supplements to Studies	5.2.320.0000.0304.02.10	Both Gull Island and Muskrat Falls Generation	
		LCP E&AA Generation Updates and Supplements to Studies	
		Muskrat Falls – Generation	
		Update to EcoRisk Assessment - Re-Baseline for Monitoring Program	
	5.2.320.0000.0304.02.10 Total		
LCP E&AA Island Transmission Aboriginal & Stakeholder Consultation	5.4.330.0000.0304.02.04	Labrador - Island Transmission Link	
		LCP E&AA Island Transmission Aboriginal & Stakeholder Consultation	
		Stakeholder Relations	
	5.4.330.0000.0304.02.04 Total		

Table 8-2 (cont'd)

CURRENT ENVIRONMENTAL STUDIES FUNDING MUSKRAT FALLS

AND LABRADOR-ISLAND TRANSMISSION LINK

Control Account Description	Control Account	Budget Items	2013 Budget
LCP E&AA Management General Consultant Services	5.1.310.0000.0000.02.00	E&AA Management	
		LCP E&AA Management General Consultant Services	
	5.1.310.0000.0000.02.00 Total		
LCP E&AA Transmission Island Link DFO Compensation Strategy	5.4.330.0000.0320.02.00	Labrador - Island Transmission Link	
		LCP E&AA Transmission Island Link DFO Compensation Strategy	
		Labrador - Island Transmission Link DFO Compensation Strategy	
	5.4.330.0000.0320.02.00 Total		
LCP E&AA Transmission Island Link Document Production	5.4.330.0000.0305.02.02	Labrador - Island Transmission Link	
		LCP E&AA Transmission Island Link Document Production	
	5.4.330.0000.0305.02.02 Total		
LCP E&AA Transmission Island Link Legal Support	5.4.330.0000.0103.02.00	Labrador - Island Transmission Link	
		LCP E&AA Transmission Island Link Legal Support	
		LIL Environmental Management Plans	
		Marine Fisheries Compensation Planning/Support	
		Socioeconomic Effects Monitoring Program	
	5.4.330.0000.0103.02.00 Total		
LCP EA GENERATION - PERMIT fees & Studies	5.2.350.0000.0320.02.00	Both Gull and Muskrat Falls Generation	
		LCP EA GENERATION - PERMIT fees & studies	
		Gull Island and MF Stream Surveys	
	5.2.350.0000.0320.02.00 Total		

Table 8-2 (cont'd)

CURRENT ENVIRONMENTAL STUDIES FUNDING MUSKRAT FALLS

AND LABRADOR-ISLAND TRANSMISSION LINK

Control Account Description	Control Account	Budget Items	2013 Budget
LCP EA Generation (Aboriginal and Stakeholder Consultation)	5.2.320.0000.0303.02.00	Both Gull Island and Muskrat Falls Generation	
		LCP EA Generation (Aboriginal and Stakeholder Consultation)	
	5.2.320.0000.0303.02.00 Total		
LCP EA Generation DFO Compensation Strategy	5.2.320.0000.0320.02.00	Both Gull Island and Muskrat Falls Generation	
		LCP EA Generation DFO Compensation Strategy	
		Muskrat Falls – Generation	
		FHCP	
	5.2.320.0000.0320.02.00 Total		
LCP EA Generation Legal Support	5.2.300.0000.0103.02.00	Both Gull Island and Muskrat Falls Generation	
		Compensation program for flooded trap lines	
		LCP EA Generation Legal Support	
		Baseline methylmercury exposure program (HHRA)	
		Generation EA Court Injunction Legal Support	
		Muskrat Falls – Generation	
		FHCP	
		Aboriginal Affairs	
		Continually engage Aboriginal groups throughout the construction and operation of the Project.	
		Aboriginal Affairs consultation - Linked to Item #1	
	5.2.300.0000.0103.02.00 Total		

Table 8-2 (cont'd)

CURRENT ENVIRONMENTAL STUDIES FUNDING MUSKRAT FALLS

AND LABRADOR-ISLAND TRANSMISSION LINK

Control Account Description	Control Account	Budget Items	2013 Budget
LCP EA Island Link Process Costs (Panel, Harmful Alteration, Disruption or Destruction [HADD], etc.)	5.4.330.0000.0310.02.00	Labrador - Island Transmission Link	
		LCP EA Island Link Process Costs (Panel, HADD, etc.)	
		LCP EA Island Link Process Costs	
	5.4.330.0000.0310.02.00 Total		
LCP IBA Third Party Service (Document Preparation IBA, IMA)	5.1.420.0000.0000.02.00	IBA	
		LCP IBA Third Party Service (Document Preparation IBA, IMA)	
	5.1.420.0000.0000.02.00 Total		
Regulatory Compliance	5.1.360.0000.0000.00.00	Both Gull Island and Muskrat Falls Generation	
		Canada Yew relocation program	
		Historic and Archaeological Resources Contingency and Response Plan	
		Historic and Archaeological Resources Recovery	
		Historic Resources Overview Assessment pre-construction Stage 1	
		Regionally uncommon aquatic vegetation survey	
		Muskrat Falls – Generation	
		Active osprey nest survey and relocation program	
		Nalcor will conduct an amphibian relocation program prior to reservoir filling.	
		Nalcor will conduct surveys of forest avifauna (ruffed grouse and wetland songbird habitat) at key intervals during construction, and operation and maintenance.	

Table 8-2 (cont'd)

CURRENT ENVIRONMENTAL STUDIES FUNDING MUSKRAT FALLS

AND LABRADOR-ISLAND TRANSMISSION LINK

Control Account Description	Control Account	Budget Items	2013 Budget
		Reservoir Beaver survey program	
		Fish Recovery/Relocation	
		Labrador - Island Transmission Link	
		Historic Resources Overview Assessment	
		Rare Plant Mitigation Efforts	
	5.1.360.0000.0000.00.00 Total		
LCP EA LIL - PERMIT fees & studies	5.4.350.0000.0320.02.00	Labrador - Island Transmission Link	
		Stream Surveys	
	5.4.350.0000.0320.02.00 Total		
Generation Environmental Policy and Plan Development	5.2.360.0000.0000.00.00	Both Gull Island and Muskrat Falls Generation	
		Compensation program for flooded trap lines	
		Nalcor will develop mitigation measures for any species of plant to be in danger of extirpation in Labrador to the LCP.	
	5.2.360.0000.0000.00.00 Total		
LIL Environmental Policy and Plan Development	5.4.360.0000.0000.00.00	Labrador - Island Transmission Link	
		Adaptive Management	
		Avifauna Considerations in Design	
		Caribou Considerations during Operations	
		Caribou Considerations in Design	
		LIL Environmental Management Plans	
		Marine Fisheries Compensation Planning/Support	
		Marten Baseline Study & Considerations in Design	

Table 8-2 (cont'd)

CURRENT ENVIRONMENTAL STUDIES FUNDING MUSKRAT FALLS

AND LABRADOR-ISLAND TRANSMISSION LINK

Control Account Description	Control Account	Budget Items	2013 Budget
		Socioeconomic Effects Monitoring Program	
	5.4.360.0000.0000.00.00 Total		
	GRAND TOTAL		**$12,972,224**

Because the project was the subject of a full environmental assessment process, the IE's review was not requested by Nalcor.

8.3.2 Studies to be Performed During Construction

Nalcor has prepared a budget for the period 2012 through 2018 to cover the required environmental activities that will be occurring during the construction period and leading up to it. As a basis for the studies, Nalcor considered the following items and commitments:

- Requirements of the Environmental Assessment (EA) for MF and the LTA;
- Commitments and anticipated requirements of the LIL EA;
- Environmental requirements of the Impacts and Benefits Agreement (IBA) with the Innu Nation;
- Mitigation measures designed to maintain compliance with applicable legislation, EA commitments and requirements, and minimize effects; and
- Baseline data needed to inform the environmental effects monitoring programs required post-construction.

Nalcor has advised MWH that they have completed extensive field programs in support of the EA process. The estimates provided herein have been derived with consideration of these costs. Nalcor advised MWH that many of the projected costs should be considered conservative with sampling frequencies at the upper limit of those expected for all programs.

Table 8-3

STUDIES AND SURVEYS TO BE PERFORMED DURING CONSTRUCTION

PROJECT/TOPIC	2012	2013	2014	2015	2016	2017	2018	Total
Muskrat Falls								
Historic Resources--Stage 1								
Historic Resources--Stage 3								
Stream Surveys								
Avifauna Management (Including Osprey nest relocation)								
Terrestrial Relocation (Beaver/Amphibian)								
Fish Recovery and Fish Relocation								
Subtotal								
Labrador TL Asset								
Historic Resources—Stage 1								
Historic Resources—Stage 3								
Stream Surveys								
Avifauna Management (Including Osprey nest relocation)								
Rare Plant Survey (Aquatic)								
Subtotal								
Island Link								
Historic Resources								
Stream Surveys								
Rare Plant Surveys								
Avifauna Management (Including Osprey nest relocation)								
Subtotal								
Total	**$90,500**	**$852,500**	**$1,027,500**	**$510,000**	**$517,500**			**$3,812,500**

Table 8-4

ENVIRONMENTAL PROGRAMS/STUDIES AND MONITORING COSTS

OPERATIONS PERIOD

Program	Year 1-5	Year 6-10	Year 11-15	Year 16-20	Year 21-25	Component	Comments
Bank Recession Rates downstream						MF	
Bank Erosion with the Reservoir						MF	
Sediment Transport						MF	
Ice Formation - Reservoirs, downstream including Mud Lake						MF	

Table 8-4 (cont'd)

ENVIRONMENTAL PROGRAMS/STUDIES AND MONITORING COSTS

OPERATIONS PERIOD

Program	Year 1-5	Year 6-10	Year 11-15	Year 16-20	Year 21-25	Component	Comments
Water Quality Monitoring						MF	
Green House Gas Flux						MF	
Fish Habitat utilization upstream and Downstream						MF	

Table 8-4 (cont'd)

ENVIRONMENTAL PROGRAMS/STUDIES AND MONITORING COSTS

OPERATIONS PERIOD

Program	Year 1-5	Year 6-10	Year 11-15	Year 16-20	Year 21-25	Component	Comments
Nutrient Levels upstream and downstream						MF	Seven years required for Granite Canal authorization. Depends of monitoring results. Based on baseline monitoring
Fish Growth, condition, fecundity, trophic feedings and age structure upstream and downstream						MF	Seven years required for Granite Canal authorization. Depends of monitoring results. Based on baseline monitoring
Entrainment						MF	One time study. Assume results are acceptable.
Compensation Works for substrate placement, habitat stability						MF	Seven years required for Granite Canal authorization. Depends of monitoring results. Based on baseline monitoring

Table 8-4 (cont'd)

ENVIRONMENTAL PROGRAMS/STUDIES AND MONITORING COSTS

OPERATIONS PERIOD

Program	Year 1-5	Year 6-10	Year 11-15	Year 16-20	Year 21-25	Component	Comments
Benthic macro-invertebrates, primary and secondary productivity, and fish health and habitat utilization in reservoir						MF	Seven years required for Granite Canal authorization. Depends of monitoring results. Based on baseline monitoring. Based on 3 trips per year.
Monitoring Wetland habitat creation and development success						MF	Assume similar requirements as FHCP. 10 year monitoring program.
Methylmercury levels in river otter						MF	Based on baseline monitoring costs. Not predicted to be an effect so monitoring will only be required for first 5 years to confirm predictions. May be revised based on monitoring results.

Table 8-4 (cont'd)

ENVIRONMENTAL PROGRAMS/STUDIES AND MONITORING COSTS

OPERATIONS PERIOD

Program	Year 1-5	Year 6-10	Year 11-15	Year 16-20	Year 21-25	Component	Comments
Monitoring of osprey methylmercury levels through feather collection						MF	Based on baseline monitoring costs. Not predicted to be an effect so monitoring will only be required for first 5 years to confirm predictions. May be revised based on monitoring results.
Telemetry monitoring of black bears (included relocated bears)						MF	Based on baseline monitoring costs. Not predicted to be an effect so monitoring will only be required for first few years to confirm predictions. May be revised based on monitoring results.

Table 8-4 (cont'd)

ENVIRONMENTAL PROGRAMS/STUDIES AND MONITORING COSTS

OPERATIONS PERIOD

Program	Year 1-5	Year 6-10	Year 11-15	Year 16-20	Year 21-25	Component	Comments
Aerial surveys to monitor the effectiveness of the beaver relocation program						MF	Based on baseline monitoring costs. Not predicted to be an effect so monitoring will only be required for first few years to confirm predictions. May be revised based on monitoring results.
Monitor relocated osprey nests						MF	Based on baseline monitoring cost. Should determine success within first 2-3 years. High degree of confidence that no significant effect. Extensive experience with technique.

Table 8-4 (cont'd)

ENVIRONMENTAL PROGRAMS/STUDIES AND MONITORING COSTS

OPERATIONS PERIOD

Program	Year 1-5	Year 6-10	Year 11-15	Year 16-20	Year 21-25	Component	Comments
Winter and summer ground surveys of wildlife habitat association transects established as part of baseline to examine changes to distribution and abundance, will be conducted for furbearers and other wildlife						MF	Based on baseline monitoring costs. Not predicted to be an effect but may be longer term in terms of seeing effects. Monitoring may be required for first 10 years to confirm predictions. May be revised based on monitoring results.
Forest avifauna will be monitored for changes in distribution and abundance by resurveying along transects established in 2006 and 2007						MF	Based on baseline monitoring costs. Not predicted to be an effect but may be longer term in terms of seeing effects. Monitoring may be required for first 10 years to confirm predictions. May be revised based on monitoring results.

Table 8-4 (cont'd)

ENVIRONMENTAL PROGRAMS/STUDIES AND MONITORING COSTS

OPERATIONS PERIOD

Program	Year 1-5	Year 6-10	Year 11-15	Year 16-20	Year 21-25	Component	Comments
Moose will be monitored using winter aerial surveys and/or GPS telemetry of moose in key wintering areas and areas where habitat is altered						MF	Based on baseline monitoring costs. Not predicted to be an effect so monitoring will only be required for first 5 years to confirm predictions. May be revised based on monitoring results.
Assessment of trapping data post project will be conducted						MF	Desk top review to confirm effects prediction. [redacted] first 5 years.
Methylmercury levels in the reservoirs will be monitored. Monitoring will include fish in the lower Churchill River, Goose Bay, and Lake Melville. Monitoring will also include seals downstream of Muskrat Falls.					$400,000	MF	[redacted] based on baseline program costs (upstream and downstream). Maybe scaled backed based on results but predicted to take 25 years to return to baseline levels.
Total MF	$7,930,000	$4,450,000	$600,000	$600,000	$600,000		

Table 8-4 (cont'd)

ENVIRONMENTAL PROGRAMS/STUDIES AND MONITORING COSTS

OPERATIONS PERIOD

Program	Year 1-5	Year 6-10	Year 11-15	Year 16-20	Year 21-25	Component	Comments
Monitor the effects on listed plants or induced effects resulting from improved access.						LIL	Limited area to be monitored
Monitoring of any compensation works as a result of HADD of marine fish habitat will be conducted according to a protocol acceptable to DFO. Initial monitoring (as-built monitoring) will be conducted to provide information on the structure of the compensation works, and subsequent effectiveness monitoring will also include a biological component to provide some measure of productivity occurring at the compensation works.						SOBI	Monitoring of the rock berms will be done using a remotely operated method such as ROV. [redacted] for data collection, data analysis and report preparation x 4 years (Year 2, 3, 5, &7) = [redacted]

Assumptions

- Based on review of Generation EIS limited monitoring for Labrador Transmission Assets

- Based on review of LIL EIS there are limited commitments for the overland transmission. Subject to conditions of EA release (i.e. assume no freshwater habitat monitoring for DFO)

8.3.4 Mitigation During Construction

Nalcor furnished to MWH a list of studies and mitigation measures that they intend to conduct during construction of the LCP. As noted previously, the mitigation measures were designed to maintain compliance with the applicable legislation, EA commitments and requirements, and to minimize effects on the habitat. We have repeated the items that contain mitigation measures in Table 8-5 that were taken from Table 8-3 without knowledge of any study work that was included with the mitigation since there was no breakout of the mitigation costs from study costs. The IE has confirmed with Nalcor that the bulk of the cost is for mitigation of the items listed in Table 8-5. Nalcor has informed MWH that if additional funds are necessary for mitigation, Nalcor will provide the funds to ensure that habitat is fully protected.

Table 8-5

MITIGATION COSTS DURING CONSTRUCTION

PROJECT/TOPIC	2012	2013	2014	2015	2016	2017	2018	TOTAL
Muskrat Falls								
Historic Resources—Stage 3								
Avifauna Management (Including Osprey nest relocation)								
Terrestrial Relocation (Beaver/Amphibian)								
Fish Recovery and Fish Relocation								
SUBTOTAL								
Labrador TL Asset								
Historic Resources—Stage 3								
Avifauna Management (including Osprey nest relocation)								
SUBTOTAL								
Island Link								
Historic Resources								
Avifauna Management (including Osprey nest relocation)								
SUBTOTAL								
TOTAL	**$870,000**	**$650,000**	**$825,000**	**$375,000**	**$392,500**			**$3,112,500**

9.3 FINANCIAL PLANNING

The Nalcor financial planning/pro forma models are comprehensive and evaluate nearly every variable of project cost, financing and debt repayment. The models address the three basic project elements, MF, LTA and LIL, each in two separate Excel workbooks. Nalcor is currently intending to finance each of MF/LTA and LIL with a series of three large bullet underwritten bonds with amortization payments going into a sinking fund.

9.3.1 Sources and Uses of Capital Funds

Tables 9-1 and 9-2 show the sources and uses of funds for the MF and LTA projects, as configured in the Nalcor financial models. The MF and LTA projects have combined debt amounts about $2.6B ($2.136B + $0.464B). The total amounts to be debt and equity funded are shown at the bottom of the Uses columns of the two tables: [redacted].

[redacted]

[redacted]

Table 9-1

MF SOURCES AND USES OF CAPITAL FUNDS

MF Sources & Uses of Funds During Funding Period					
Sources	**$ Million**	**%**	**Uses**	**$ Million**	**%**
Pre-FC Equity Funding	[redacted]		Pre-FC Capex & Innu	[redacted]	
Post-FC Equity Funding			Post-FC Capex		
Debt Funding			Post-FC Innu Payments		
Interest on BSF			Financing Upfront Fees		
Interest on SDN & BHA			Capitalized Interest		
			DSRA Pre-Funding		
			LRA Funding		
Total	[redacted]	**1.00**	**Total**	[redacted]	**1.00**

Table 9-2

LTA SOURCES AND USES OF CAPITAL FUNDS

LTA Sources & Uses of Funds During Funding Period					
Sources	**$ Million**	**%**	**Uses**	**$ Million**	**%**
Pre-FC Equity Funding			Pre-FC Capex & Innu		
Post-FC Equity Funding			Post-FC Capex		
Debt Funding			Financing Upfront Fees		
Interest on BSF			Capitalised Interest		
Interest on SDN & BHA			DSRA Pre-Funding		
			LRA Funding		
Total		**1.00**	**Total**		**1.00**

Analysis of the LTA information, paralleling the above discussion for the MF project confirms the "Debt Funding" labeled debt financing amount of $0.464B for the LTA project.

Table 9-3 shows the sources and uses of funds for LIL as per the Nalcor financial models. LIL has a maximum allowable debt amount of $2.4B.

Table 9-3

LIL SOURCES AND USES OF CAPITAL FUNDS

LILSources & Uses of Funds During Funding Period					
Sources	**$ Million**	**%**	**Uses**	**$ Million**	**%**
Debt Funding			Pre-FC Capex		
Equity Funding			Post-FC Capex		
AFUDC on Equity			Financing Costs		
			IDC / AFUDC		
			DSRA		
Total		**1.00**	**Total**		**1.00**

Financial planning must be revisited by Nalcor once the capital cost estimates, O&M cost estimates, and forms of long-term financing are better defined.

The LIL models do not include Sources and Uses of Capital Funds tables, per se, but are found in the Sum CCE table; LIL Model.

9.4 ANNUAL COSTS

Annual costs may seem immaterially small in comparison with the capital costs of the LCP, but it will be important to forecast annual costs for the purposes of bond documents. Operations and

WMA that provides storage at Churchill Falls and a means of operating the Churchill River to near-optimize the power production.

Hydrological risk in terms of construction diversion flows at Muskrat Falls have been satisfactorily studied and cofferdam heights and means of diversion have been designed to account for ice jams as well as flood flows with a return period of 20-years; 40-years for the ice jam events. Mitigation of flooding event risks beyond these normally assumed return-period events will be the responsibility of Nalcor Energy.

10.1.3 Construction Plan and Schedule

Construction safety requires contractors to supply their Health, Safety and Security Plans as part of their required submittals. They must follow the generally-high standards established by Nalcor Energy which follows a 'safety first' philosophy. We understand that Nalcor intends to strictly monitor these plans to ensure these requirements are met.

The risk of problems associated with transportation are mitigated to some extent by Nalcor providing storage facilities at two locations as well as providing transportation to the sites of the projects. Risk associated with transportation of materials, equipment, and supplies to these facilities is the responsibility of the contractors. Risk still exists using overseas suppliers, however, these shipments will be closely monitored as required by Nalcor's overarching transportation plan by the Integrated Project Team.

RFPs and Contracts reviewed to date are generally satisfactorily written and similar with respect to terms and conditions imposed on the suppliers and contractors. The contracts convey to the parties the clear responsibilities of the contractor as well as Nalcor, with no ambiguities detectable by the IE in the documents we have reviewed to date. Nalcor has established a system wherein they weigh the bid amount with the security provided (performance bond amount, letters of credit, and parent-company guarantees) to arrive at a satisfactory level of risk and to keep the price as low as practical. We normally do not see this level of balancing all factors considering risk to reduce cost on other projects we are aware of, but find the methodology employed by Nalcor to be satisfactory for the projects.

We have reviewed the Integrated Project Schedule prepared by Nalcor and find that it is generally complete as far as listing contracts, but it is a Gantt chart without activity linking, critical path(s), float time, etc., and is not suitable to the level of detail we require and had expected to view to allow us to form opinions. Until we view more large contracts under construction and obtain the P6 classic CPM view of the project schedule, we cannot express an opinion as to the likelihood of the contracts being completed as scheduled.

10.1.4 Capital Budget

After reviewing Nalcor's detailed cost estimate and supporting documentation it's our opinion that the DG3 cost estimate was robustly prepared and follows the general procedures as

outlined by the AACEI for a Class 3 cost estimate. Based on the limited number of awarded contracts to date and other contributing factors, we believe that DG3 cost estimate complies with AACEI's recommended range of accuracy for a Class 3 cost estimate: -20% to +30%..

Construction to date pertaining to the contracts that MWH is required to review is limited to the Bulk Excavation contract, CH0006, that currently is on, or ahead of, schedule and at budget levels. [redacted]

10.2 RECOMMENDATIONS

1. Nalcor is requested to furnish to the IE the Contractor schedules to enable the IE to fulfill its obligations under the Project Financing Agreements.

2. When available, Nalcor is requested to furnish to the IE for review the complete analysis of the North Spur including the laboratory test reports that determine the strength of the soils under the loadings that it will sustain during the life of the project.

3. In accordance with the Project Financing Agreements, updated cost estimates will be provided as stipulated in said Agreements.