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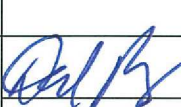

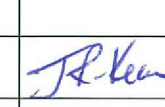

Nalcor Energy – Lower Churchill Project



Decision Gate 3 Capital Cost Estimate

LCP-PT-ED-0000-EP-ES-0002-01

Comments: <i>Content is considered commercially sensitive; viewing as approved by Project Director or LCP VP only.</i>	Total # of Pages (Including Cover): 87 (excluding Attachment B.7)
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Status/ Revision	Date	Reason For Issue	Prepared By	Checked by	Checked by		Project Director Approval
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1.0 Purpose

This *Decision Gate 3 Capital Cost Estimate* report presents the DG3 Capital Cost Estimate (CCE) for the Project used to support the Decision Gate 3 recommendation for Nalcor Energy's Lower Churchill Project (hereafter referenced to as LCP or the Project).

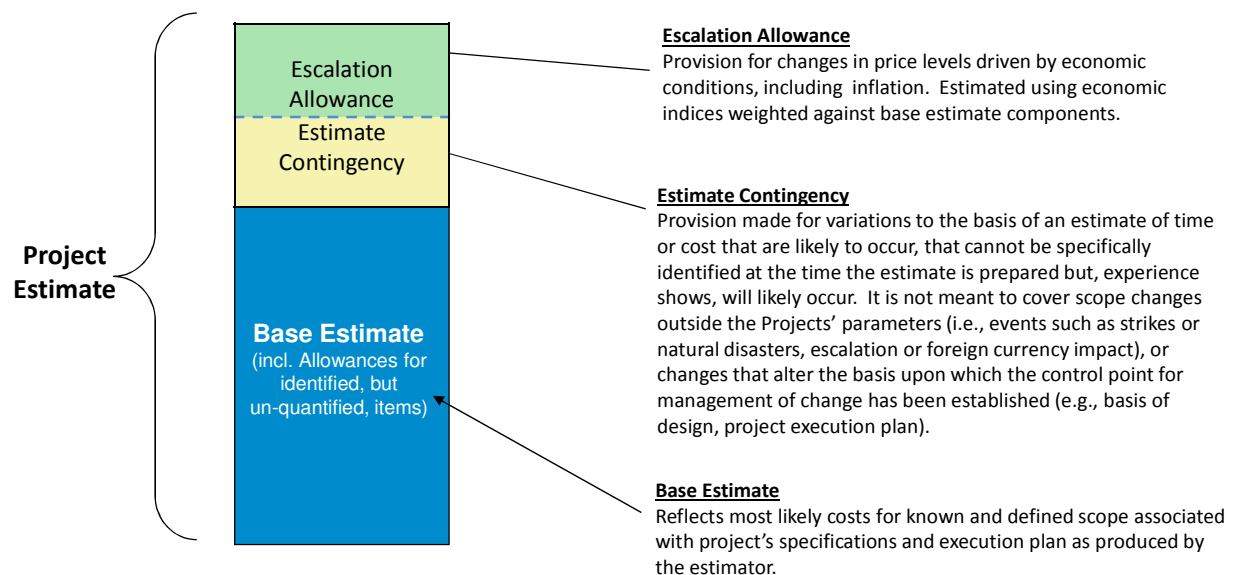
This *Decision Gate 3 Capital Cost Estimate* report also provides the critical context of the various sources that were used in the compilation of the Capital Cost Estimate and provide a road map, or table of contents, to enable the reader to easily locate the information within various backup information that support the DG3 CCE.

This document is not intended to outline the basis of the estimate, as that information is contained in [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-PC-ES-0001-01](#).

2.0 Scope

The DG3 Capital Cost Estimate (CCE) is comprised of three (3) components as illustrated in Figure 2-1.

Figure 2-1: Capital Cost Estimate Components



This *Decision Gate 3 Capital Cost Estimate* presents the overall Project Cost Estimate, including of Estimate Contingency and Escalation Allowance. For further details on the parameters or basis of the Base Estimate, refer to [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-EP-ES-0001-01](#).

Details to support the calculation of Escalation Allowance and Estimate Contingency are contained in the documents [Decision Gate 3 Capital Cost Escalation Report](#), reference no. LCP-PT-ED-0000-EP-RP-0003-01, and [Decision Gate 3 Project Cost and Schedule Risk Analysis Report](#), reference no. LCP-PT-ED-0000-RI-RP-0002-01, respectively. Combined all three (3) documents substantiate the basis of the overall DG3 capital cost estimate as used in the DG3 Cumulative Present Worth (CPW) analysis for the following sub-projects of the LCP:

- Muskrat Falls Generation (MFG)
- Labrador Transmission Assets (LTA)
- Labrador – Island Transmission Link (LITL)

This report excludes the basis for the operating cost estimate prepared for DG3. Reference [Decision Gate 3 Operating Cost Estimate](#), reference no. LCP-PT-ED-0000-EP-ES-0003-01 for details.

This report excludes the following:

- The Maritime Link Project as that project is being managed by Emera.
- Any financing-related charges, including interest paid on financing arrangements and the cost associated with arranging such financing.

3.0 Definitions

[LCP-PT-MD-0000-PM-LS-0001-01 Project Dictionary, Acronyms & Abbreviations List](#) is the approved dictionary of definitions for the Project.

Allowance	Costs added to the base estimate, based on experience, to cover foreseen but not fully defined elements.
Analogous Estimate	An estimate based on previous similar projects.
Base Estimate	Reflects most likely costs for known and defined scope associated with project's specifications and execution plan.
Baseline	The project scope, in terms of quantity, quality, timing, hours, costs, etc that establishes a formal reference for comparison and verification of subsequent efforts, progress, analysis and control.
Bin	Group of similar cost items to which an escalation index is applied. Also referred to as an escalation bin.
Decision Gates	A Decision Gate is a predefined moment in time where the Gatekeeper has to make appropriate decisions whether to move to the next stage, make a

temporary hold or to terminate the project. The option to recycle to the current stage is considered an undesirable option unless caused by changes in business conditions.

Escalation Provision for changes in price levels driven by economic conditions. Includes inflation.

Estimate Contingency Provision made for variations to the basis of an estimate of time or cost that are likely to occur, that cannot be specifically identified at the time the estimate is prepared but, experience shows, will likely occur.

Note: Estimate Contingency does not cover scope changes outside the Project's parameters, events such as strikes or natural disasters, escalation or foreign currency impact, or changes that alter the basis upon which the control point for management of change has been established as captured in key project documents (e.g. basis of design, project execution plan).

Physical Component A breakdown of major physical components identified/associated with the LCP.

Project Exchange Rates A fixed set of foreign exchange rates used in the CCE for conversion of all foreign currencies to Canadian equivalent for the purposes of establishing the CCE.

Project Scope A concise and accurate description of the end products or deliverables to be expected from the project and that meet specified requirements as agreed between the Project Stakeholders. It represents the combination of all project goals and tasks, and the resources and activities required to accomplish them.

Risk An uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives.

Work Breakdown Structure The decomposition of the project scope into more manageable packages of work or deliverables. Each WBS element will have an approved budget that will be defined in the Project Budget.

4.0 Abbreviations and Acronyms

AACEI	Association for Advancement of Cost Engineering International
ac	Alternating Current
BOQ	Bill of Quantities
CAPEX	Capital Expenditure
CCE	Capital Cost Estimate
CF	Churchill Falls
dc	Direct Current
DG3	Decision Gate 3
EA	Environmental Assessment
ECC	Energy Control Centre
EPC	Engineer, Procure & Construct
EPCM	Engineering, Procurement, and Construction Management
ES	Estimating Software (HCSS Heavy Bid estimating software)
FOREX	Foreign Exchange
HADD	Harmful Alteration, Disruption or Destruction
HSE	Health, Safety and Environment
HVac	High Voltage alternating current
HVdc	High Voltage direct current
IBA	Impacts and Benefits Agreement
IPE	International Project Estimating
kV	kilovolt
MFG	Muskrat Falls Generation
MHI	Manitoba Hydro International
ML	Maritime Link
MTO	Material Take Off
MW	Megawatt
NE	Nalcor Energy
LCP	Lower Churchill Project
LITL	Labrador-Island Transmission Link
LTA	Labrador Transmission Assets
OPEX	Operating Expenditure
OPGW	Optical Ground Wire
PMT	Project Management Team
RCC	Roller-Compacted Concrete
ROW	Right Of Way
SLI	SNC-Lavalin Inc.
SOBI	Strait of Belle Isle
SP	Soldier's Pond
Te	Metric Tonne (1000 kilograms)
WBS	Work Breakdown Structure

Note: The above definitions are aligned with the Association for the Advancement of Cost Engineering (AACE) International Recommended Practice No. 10S-90.

5.0 Reference Documents

LCP-PT-MD-0000-PC-LS-0001-01	Project Work Breakdown Structure and Code of Accounts
LCP-PT-MD-0000-PC-BD-0001-01	Lower Churchill Project – Asset Schematic by Project
LCP-PT-MD-0000-FI-PR-0004-01	Cost Allocation Principles
LCP-PT-MD-0000-PC-PL-0001-01	Project Controls Management Plan
LCP-PT-ED-0000-EP-RP-0003-01	Decision Gate 3 Capital Cost Escalation Report
LCP-PT-ED-0000-RI-RP-0002-01	Decision Gate 3 Project Cost and Schedule Risk Analysis Report
LCP-PT-ED-0000-EP-ES-0001-01	Decision Gate 3 Basis of Estimate
LCP-PT-MD-0000-PM-PL-0002-01	Project Change Management Plan
LCP-PT-ED-0000-EP-ES-0003-01	Decision Gate 3 Operating Cost Estimate

6.0 Responsibilities

Not Applicable

7.0 Format of this Document

As indicated in Section 1.0, this *Decision Gate 3 Capital Cost Estimate* report provides a road map, or table of contents, to enable the reader to easily locate the information within various and substantive backup information that supports the DG3 CCE.

Contained within Attachment B.5 and B.6 provides a listing of the volumes of supporting documentation produced by Nalcor and SNC-Lavalin, respectively, during the compilation of the DG3 CCE. E-copies of this material are securely located in the working level files at the following directory location and are available for reference.

R:/Project Services/Estimate/DG3 Estimate/DG3 Estimate and FM Back-up/Estimate Reference Binders

Attachment B.7 provides four (4) binders of supporting Decision Gate 3 CCE and Financial Model Back-up as used to support the financial modelling (including Cumulative Present Worth analysis) undertaken by Nalcor Investment Evaluation.

8.0 Project Scope Description

The Churchill River is located in Labrador in the Province of Newfoundland and Labrador, Canada. The existing 5,428 megawatt (MW) Churchill Falls Generating Station, which began producing power in 1971, harnesses about 65% of the potential generating capacity of the river. The remaining 35% is planned to be developed via two sites on the lower Churchill River, known as the Lower Churchill Project (LCP).

The LCP consists of two undeveloped hydroelectric sites and associated transmission systems: Gull Island Hydroelectric Development, located 225 km downstream from the existing Churchill Falls Generating Station; and Muskrat Falls Hydroelectric Development, located 60 km downstream from the proposed Gull Island Hydroelectric Development.

This Basis of Estimate is relevant for the Muskrat Falls Hydroelectric Development, which consists of a generating station of 824 MW capacity and associated transmission systems.

The Project's scope is defined in the [Basis of Design](#), document no. [LCP-PT-ED-0000-EN-RP-0001-01 Rev. B2](#), while a summary is presented below.

Phase I of the LCP is comprised of four sub-projects:

- Muskrat Falls Generation (MFG)
- Labrador Transmission Assets (LTA)
- Labrador – Island Transmission Link (LITL)
- Maritime Link (ML)

This report presents the Basis of Estimate for the CCE for all but the Maritime Link.

8.1 Muskrat Falls Generation

Muskrat Falls Generation includes the following sub-components which are broken down under the five principal areas of the development.

- 22 km of access roads, including upgrading and new construction, and temporary bridges;
- A 1,500 person accommodations complex (for the construction period);
- A north Roller Compacted Concrete (RCC) overflow dam;
- A south rock fill dam;
- River diversion during construction via the spillway;
- Five vertical gate spillway;
- Reservoir preparation and reservoir clearing;
- Replacement fish and of terrestrial habitat;
- North spur stabilization works;

- A close coupled intake and powerhouse, including:
 - 4 intakes with gates and trash racks
 - 4 turbine/generator units at approximately 206 MW each with associated ancillary electrical/mechanical and protection/control equipment
 - 5 power transformers (includes 1 spare), located on the draft tube deck of the powerhouse
 - 2 Overhead cranes each rated at 450 Tonnes

8.2 Labrador Island Transmission Link (LITL)

The LITL consists of the overland high voltage direct current (HVdc) Transmission system and associated HVdc converter station systems, the Strait of Belle Isle (SOBI) Crossing and a new synchronous condenser facility. Specifically it includes:

- AC Switchyard at Soldier's Pond on the Avalon Peninsula;
- Muskrat Falls HVdc converter stations: HVdc bipolar converter station; 315 kV ac, converted to ± 320 kV dc; Pole capacity of 450 MW;
- Shoreline pond electrode located on the Labrador side of the Strait of Belle Isle. The Anse-au-Diable shoreline pond electrode will be connected to the converter station at Muskrat Falls with dual overhead conductors supported on a wood pole line from the pond electrode site to the HVdc transmission line Right of Way and from there on will be supported on the HVdc Line structures.
- Soldier's Pond HVdc converter station: HVdc bipolar converter station; 230 kV ac, converted from ± 350 kV dc; Pole capacity of 450 MW; and Shoreline pond electrode located on the east shore of Conception Bay
- The Dowden's Point shoreline pond electrode will be connected to the converter station at Soldiers Pond with dual overhead conductors supported on a wood pole line.
- HVdc Transition Compounds for the Strait of Belle Isle submarine cable terminations
- 3 Mass Impregnated 450MW capacity each submarine cables crossing the SOBI protected using HDD boreholes and seabed rock berm placement.
- One transition compound for each side of the Strait of Belle Isle submarine cable crossing, with associated switch works to manage the junction of multiple submarine cables and the overhead transmission line.
- Overhead transmission line from the Muskrat Falls converter station to Soldiers Pond converter station: 900 MW, ± 320 kV dc, bipolar line, single conductor per pole; Galvanized lattice steel guyed suspension and rigid angle towers; 1100 km long.
- New synchronous condenser at Soldier's Pond – 3 x 150 MVar units

- Conversion of Holyrood Thermal Units 1 & 2 to synchronous condenser support
- Breaker upgrades/replacements at the Sunnyside Terminal Station
- ECC Upgrades and fibre communication connections to Soldier's Pond.
- Operations Telecommunication system.

Note: For the purposes of the EPCM Contract, the scope of work does not include any infrastructure or services associated with the actual crossing of the Strait of Belle Isle, ECC upgrades, or the Holyrood conversions.

8.3 Labrador Transmission Asset (LTA)

LTA consists in the AC transmission line system from Churchill Falls to Muskrat Falls, specifically:

- Churchill Falls switchyard extension;
- Muskrat Falls switchyard;
- Transmission lines from Muskrat Falls to Churchill Falls: double-circuit 315 kV ac, 3 phase lines, double bundle conductor, single circuit galvanized lattice steel guyed suspension and rigid angle towers; 247 km long.
- 735 kV transmission line at Churchill Falls interconnecting the existing and the new CF switchyards
- Labrador Fibre Project (Nalcor's participation in Bell Aliant led initiative)

9.0 DG3 Capital Cost Estimate

The Decision Gate 3 CCE can be presented in a number of ways based on the coding that has been applied to the details that contribute to the total compiled estimate. One of the key breakdowns of the estimate is by Project. The boundary limits associated with the sub-projects are shown in the [Asset Schematic by Project](#), reference no. [LCP-PT-MD-0000-PC-BD-0001-01 Rev B1](#), and is included as Attachment B.1.

The three (3) components of the Capital Cost Estimate are the Base Estimate, Estimate Contingency, and Escalation Allowance. Table 9-1 provides a breakdown of the DG3 Capital Cost Estimate by Project and Estimate Component.

Table 9-1: Summary of Project Capital Cost Estimate

	Muskrat Falls	LTA	LITL	Total
Base Estimate	\$2,511,923,504	\$601,311,778	\$2,359,610,970	\$5,472,846,252
Growth Allowance = Estimate Contingency + Escalation Allowance	\$389,234,769	\$90,270,587	\$250,137,947	\$729,643,303
Total	\$2,901,158,273	\$691,582,365	\$2,609,748,917	\$6,202,489,555

The Estimate Contingency recommendations are established in the [Decision Gate 3 Project Cost and Schedule Risk Analysis Report](#), reference no. [LCP-PT-ED-0000-RI-RP-0002-01](#).

The Escalation Allowance is presented in the [Decision Gate 3 Capital Cost Escalation Report](#), reference no. [LCP-PT-ED-0000-EP-RP-0003-01](#).

The calculated Base Estimate component of the DG3 CCE for each of MF, LTA and LITL by major scopes of work are shown in Tables 9-2, 9-3 & 9-4.

Attachment B.2 contains further breakdowns of the three projects by Contract Packages and Physical Components. Note that Attachment B.2 excludes both “D-General” and “E-Historical” costs as they are self explanatory in Tables 9-2, 9-3 & 9-4.

The overall DG3 Base Estimate is a combination of sources (reference Section for 11.0 for details) and for analysis has been compiled into a Master Excel file “**DG3 Estimate Master Rev20**” securely held at the following location for reference:

R:/Project Services/Estimate/DG3 Estimate/DG3 Estimate and FM Back-up/Estimate Reference Binders/ E – Compiled Files

Table 9-2: Muskrat Falls Base Estimate by Major Scopes of Work

A - Muskrat Falls Generation	\$2,077,401,708
A.1 - Accomodation Complex/Admin/UtilitiesAccess Roads/Construction Power	\$166,608,338
A.2 - Bulk Excavation and Main Civil works for Intake and Powerhouse, Spillway and Transition Dams	\$823,064,224
A.3 - North Spur/ North and South Dams/Reservoir Clearing/Habitat Compensation works	\$336,605,489
A.4 - T&G's/Powerhouse Mechanical and Electrical Auxiliaries/Hydro Mechanical Equipment/GSU's/ Collector Lines	\$484,012,733
A.5 - Telecommunications	\$17,298,550
A.6 - Site Services	\$248,312,374
A.7 - Spares	\$1,500,000
D - General	\$337,218,632
D.1 - Project Management	\$292,987,287
D.2 - Integrated Commissioning Services	\$1,950,000
D.3 - Project Vehicles / Helicopter Support	\$5,691,750
D.4 - Insurance/Commercial	\$14,531,242
D.5 - Land Acquisitions and Permits	\$1,115,004
D.6 - Quality Surveillance & Inspection/Freight Forwarding Services	\$4,700,000
D.7 - Environmental & Aboriginal Affairs	\$16,243,349
E - Historical	\$97,303,164
D.8 - Historical Cost	\$97,303,164
Grand Total	\$2,511,923,504

Table 9-3: Labrador Transmission Assets Base Estimate by Major Scopes of Work

C - Labrador Transmission Asset	\$498,769,539
C.1 - OL Transmission CF-MF	\$288,254,205
C.2 - Switchyards	\$192,087,214
C.3 - Telecommunications	\$15,467,507
C.4 - Spares	\$2,960,613
D - General	\$98,346,146
D.1 - Project Management	\$82,891,340
D.2 - Integrated Commissioning Services	\$9,372,938
D.3 - Project Vehicles / Helicopter Support	\$842,250
D.4 - Insurance/Commercial	\$2,519,988
D.5 - Land Acquisitions and Permits	\$1,119,630
D.6 - Quality Surveillance & Inspection/Freight Forwarding Services	\$1,600,000
E - Historical	\$4,196,093
D.8 - Historical Cost	\$4,196,093
Grand Total	\$601,311,778

Table 9-4: Labrador-Island Transmission Link Base Estimate by Major Scopes of Work

B - Labrador - Island Transmission Link	\$2,012,062,855
B.1 - Converters/Transition Compunds/Synch Condensers/SP Switchyard	\$639,805,781
B.2 - Electode Sites/Island Upgrades	\$77,613,063
B.3 - OL Transmission MF-SP	\$929,045,619
B.4 - SOBI Marine Crossing	\$337,440,262
B.5 - Telecommunications	\$21,433,995
B.6 - Spares	\$6,724,135
D - General	\$262,240,951
D.1 - Project Management	\$194,893,751
D.2 - Integrated Commissioning Services	\$3,053,762
D.3 - Project Vehicles / Helicopter Support	\$10,311,000
D.4 - Insurance/Commercial	\$15,674,421
D.5 - Land Acquisitions and Permits	\$18,472,787
D.6 - Quality Surveillance & Inspection/Freight Forwarding Services	\$8,100,000
D.7 - Environmental & Aboriginal Affairs	\$11,735,229
E - Historical	\$85,307,165
D.8 - Historical Cost	\$85,307,165
Grand Total	\$2,359,610,970

10.0 Capital Cost Flows

Figure 10-1 provides an overview of the technique or methodology used to produce cost flows for the Project. In general terms, the Base Estimate is broken into key components of material, equipment and labor resource types of each Physical Component (e.g. Powerhouse, Reservoir Clearing, etc.) and is time-phased against the project schedule in Primavera Project Planner to produce cost flows.

Specifically, the estimate coding applied in the overall DG3 CCE master spreadsheet enabled the cost to be organized by various groupings. The physical component of an asset being constructed and the contract package under which a particular scope of work associated with that physical component enabled the estimate to be coded with a Primavera P6 Activity Code. In addition the cost estimate against each P6 activity was broken down by escalation bin to enable an escalation analysis to be performed. This process is outlined in detail in [Decision Gate 3 Cost Escalation Report](#), reference no. [LCP-PT-ED-0000-EP-RP-0003-01](#). A list of the P6 Activity Codes and the Base Estimate associated with each was provided to planning. Using the information available from the Project Control Schedule, the entire Base Estimate was loaded into the Primavera P6 and time phased cost flows were generated in line with the DG3 baseline schedule. The Base Estimate time-phased data that was created was then combined with the Escalation Allowance and the Estimate Contingency profiles for each of the three (3) sub-Projects (MF, LTA and LITL). This process is outlined in Figure 10-2.

Summary level incurred cost flows , as presented to support CPW modeling, for the combined three (3) sub-Projects is contained in Attachment B.4. Detailed sub-project cost and cash flows curves have also been prepared and are available in the Attachment B.7.

Figure 10-1: Determination of Base Estimate Cost Flow

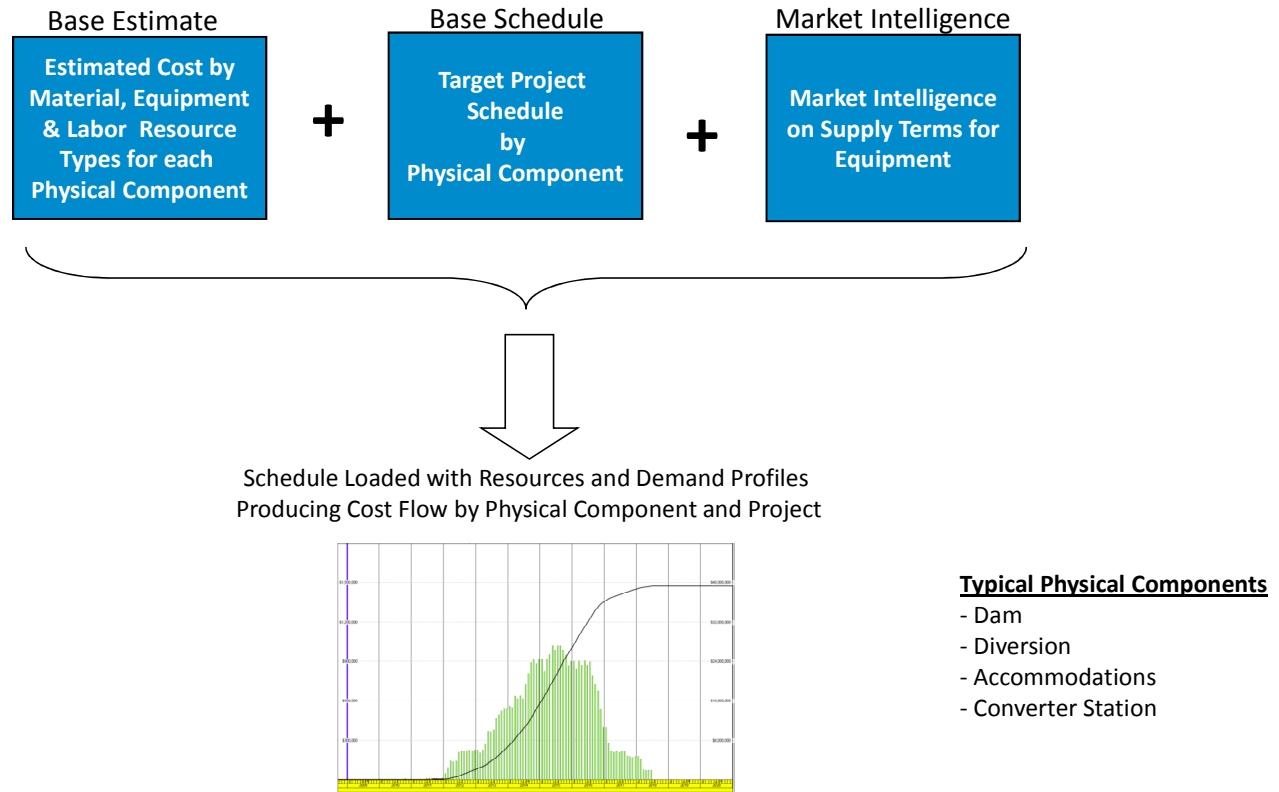
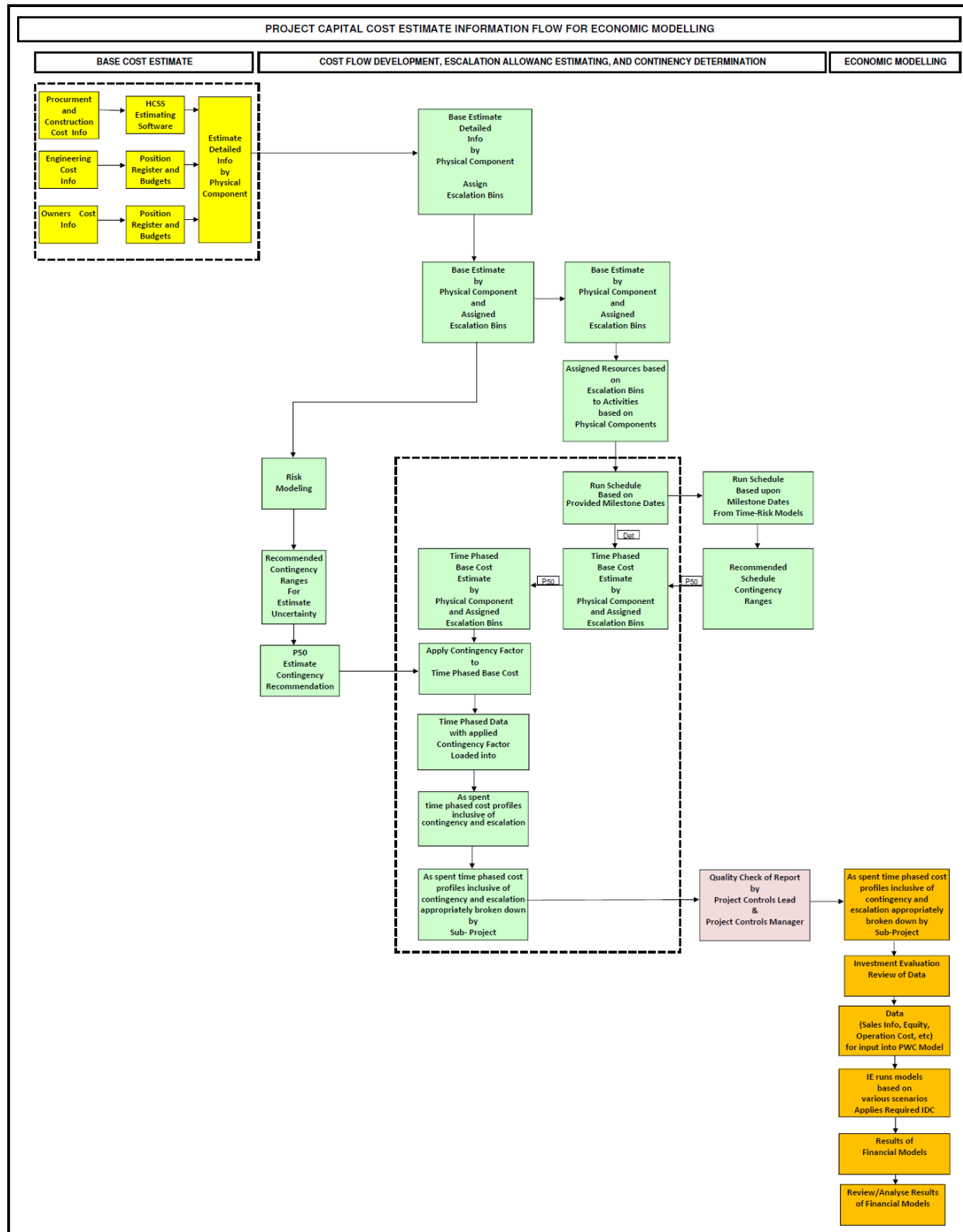


Figure 10-2: Overall Cost Estimate Development Process Flow



11.0 DG3 CCE Information Sources

The DG3 Capital cost estimate as stated earlier consist of the Base Estimate, Estimate Contingency, and Escalation Allowance. The Base Estimate required the inclusion of all aspects of the engineering, procurement, construction, and project management involved in the execution of the Project. Therefore the compiled estimate involved information from a number of sources. These sources are presented in Table 11-1.

Table 11-1: DG3 Capital Base Estimate by Project and Information Source

Source	Muskrat Falls Generation Facility (MF)	Labrador - Island Transmission Link (LITL)	Labrador Transmission Asset (LTA)	Totals
A: HCSS Total	\$2,084,673,458	\$1,649,537,355	\$500,284,727	\$4,234,495,540
B: EPCM File	\$166,875,704	\$116,326,199	\$68,803,553	\$352,005,456
C: Land File	\$1,085,000	\$18,418,000	\$1,090,000	\$20,593,000
D: Permit File	\$30,004	\$54,787	\$29,630	\$114,420
F: SOBI SS	\$0	\$337,330,262	\$0	\$337,330,262
G: Owners Team	\$105,201,019	\$62,717,606	\$8,943,447	\$176,862,072
H: April Incurred (Historical)	\$97,303,164	\$85,307,165	\$4,196,093	\$186,806,422
I: Additional Items	\$14,005,408	\$56,231,286	\$12,242,906	\$82,479,600
J: Corporate OH	\$5,789,736	\$1,262,133	\$1,753,063	\$8,804,931
K: Commercial	\$6,504,982	\$1,381,001	\$1,918,168	\$9,804,151
L: Tax and Audit	\$419,463	\$91,440	\$127,007	\$637,910
M: IT Life of Project Cost	\$5,765,957	\$4,925,088	\$1,321,365	\$12,012,410
N: Environmental and Aboriginal Affairs	\$16,243,349	\$11,735,229	\$0	\$27,978,578
O: Insurance	\$8,026,260	\$14,293,420	\$601,820	\$22,921,500
Totals	\$2,511,923,504	\$2,359,610,970	\$601,311,778	\$5,472,846,252

As discussed in the [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-EP-ES-0001-01](#), the vast majority of the procurement construction scope of work for the LCP Phase I was within the EPCM Services Agreement. Therefore, the majority of the estimated cost included in the DG3 Estimate (77.4%) was provided by the HCSS (Heavy Civil Software System) which was utilized by the EPCM consultant in the compilation of their construction cost estimate.

Figure 11-1 indicates by percentage the contribution of various sources into the DG3 Base Estimate.

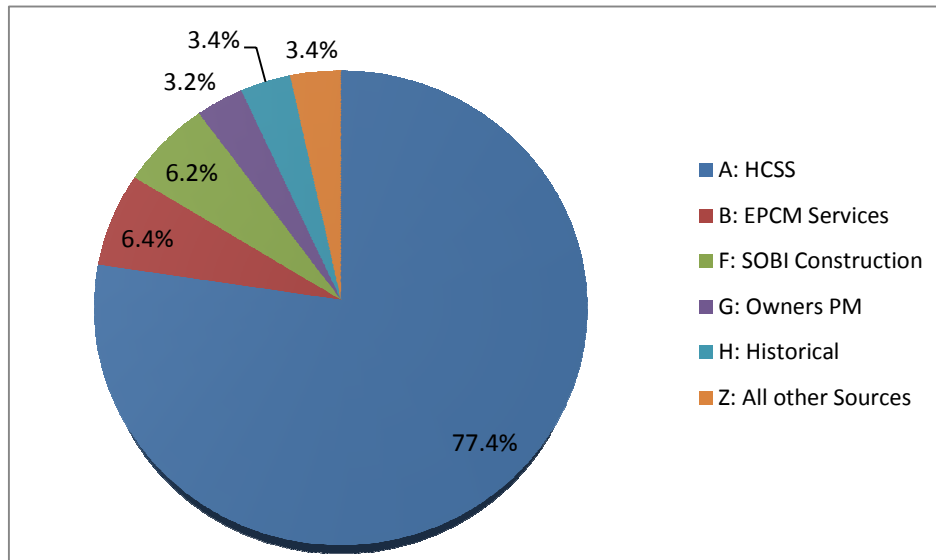
Figure 11-1: DG3 Base Capital Cost Estimate Contribution by Source

Figure 11-1 shows that the combined EPCM Services (6.4%) and Owners PM (3.2%) combine for 9.6% of the DG3 Base Estimate being attributable to Project Management type activities. However, it should be noted that the historical cost also contains a sizable portion of this type of cost as it contains all historical cost that have been incurred against the projects.

It should also be noted that a significant cost has been incurred against the achievement of an Environmental Assessment (EA) release for the MF and LTA sub-Projects. Included in this EA release was cost associated with the Gull Island (GI) project which is included in Phase II of the LCP Project. Approximately 30% of the EA process cost was included in LCP Phase I while the remaining 70% was allocated to the Phase II Gull Island Project.

To facilitate the summation, organizing and reporting of the DG3 CCE, all of the estimate information from the various sources was compiled into a single Excel Master workbook. Since the HCSS contained the vast majority of the detailed information – the export template from HCSS was used as the base for the fields in the Master workbook. Additional coding fields were defined to enable an accurate breakdown of the estimates. Codes were used to capture (where applicable) such information as:

- Information Source
- Project
- Contract Package
- Physical Component
- Resource Designation
- Primavera P6 Activity
- Etc.

11.1 A: HCSS (Heavy Civil Software System)

As discussed in the [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-EP-ES-0001-01](#), the EPCM Consultant (SLI) engaged a number of estimate specialist in the development of a Base Estimate for procurement and construction of all of the physical components contained within the EPCM Services Agreement. As outlined previously this included all assets of LCP Phase I except the SOBI Marine Crossing and the fiber optic line connecting Labrador West to Happy Valley Goose Bay.

The efforts of the estimators were then compiled into HeavyBid HCSS to ensure that rates being applied to quantities were consistent with respect to labor, equipment rentals, permanent equipment procurement, and commodities.

In addition, the HCSS estimate was organized by Commitment Package (CP) in accordance with the [LCP Master Package Dictionary](#), reference no. [LCP-SN-CD-0000-PM-LS-0001-01 Rev B2](#). Some of the CP's require the execution of scope from more than one (1) of the MF, LTA, or LITL projects. An example would be CP CD0503 the construction of earthworks at the various power distribution sites. A list of all CP's from HCSS and their associated Base Estimate is provided in Attachment B.3 with the appropriation of estimate associated with each of the major projects indicated.

11.2 B: EPCM (Engineering, Procurement and Construction Management) Services

Reflects the costs estimated for EPCM Services as discussed in Part C: EPCM Services of [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-EP-ES-0001-01](#). Includes all salaries, burdens, assignment conditions, offices, travel and associated costs.

11.3 C: Land Acquisitions

Reflects the costs estimated for Lands Acquisitions as discussed in Part B: Owner's Project Management and Other Costs, Section 23.25 – Property and Lands of [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-EP-ES-0001-01](#). Includes:

- Land Purchases
- Crown Land Fees
- Legal Fees for Purchase (Internal and External)
- Surveying
- Land Appraisals
- Damage Claims
- Staff Expenses
- Helicopter usage

11.4 D: Permits

Reflects the costs estimated for Permits as discussed in Part B: Owner's Project Management and Other Costs, Section 23.26 – Permits of [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-EP-ES-0001-01](#).

A detailed file was provided which outlined the various types of permits considered to be required along with quantity for each type and the estimated cost associated with each permit. Permits were considered under the following categories: Culverts, Bridges, Stream Diversions, Cutting, Quarries, Utilities (Wells, water and Sewer etc), Building Accessibility, and Building Fire and Life Safety. The various permits were quantified against each of the projects and totaled for inclusion in the master estimate workbook.

11.5 F: SOBI Marine Crossing

Reflects the costs estimated for Permits as discussed in Part G: SOBI Crossing of [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-EP-ES-0001-01](#).

The construction cost associated with the SOBI Marine crossing was provided by the Marine Crossing Installation Team. The cost estimate was entered into the master estimate workbook under the major headings of Cable Supply and Install, Horizontal Directional Drilling (HDD), and Subsea Rock Installation. A more detailed breakdown is provided in the estimate back up binders. Note that these cost estimates are only applicable to the LITL Project.

11.6 G: Owners Team Project Management

Reflects the costs estimated for Permits as discussed in Part B: Owner's Project Management and Other Costs of [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-EP-ES-0001-01](#).

The Owner's Team base cost estimate is based on the Owner's Team organization charts. Each position on the owner's team is captured in a position register and assigned a Position ID and projected start and finish dates. A budgeted charge rate is applied to the position and based on the charge rate and position duration a salary cost estimate for each position is developed. In addition cost associated with staff type positions such as phone, computers, software requirements, etc. is calculated based on the position register information. The sum of the owner's team salaries and associated expenses are entered into the master spreadsheet by Project.

11.7 H: Historical Information (Incurred Cost to April 2012)

Reflects the costs estimated for Owners Team Project Management as discussed in Part B: Owner's Project Management and Other Costs, Section 23.29 – Historical Costs of [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-EP-ES-0001-01](#).

The Historical information is the Incurred Cost to April 2012 as reported from PRISM, the Project Cost and Progress Control System used by Nalcor to report the Project's cost. The information was entered in the master spreadsheet by Project based on the allocation methodology employed at the time of DG3 CCE.

11.8 I: Additional Items

Reflects the costs estimated for various items as discussed in Part B: Owner's Project Management and Other Costs of [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-EP-ES-0001-01](#).

Upon review of the Base Estimate information that was provided it was evident that a number of costs expected to be charged to the project's execution were not accounted for. The Additional Items estimate accounts for these items and includes cost associated with missed scopes of work, missed procurement items, and incentive programs anticipated to be implemented. Major contributors to the Additional Items included the following:

- Fibre Optic Line from Labrador West to Happy Valley Goose Bay
- Synchronous Condenser Conversion of Units 1 & 2 at Holyrood
- Breaker Installations associated with Island Upgrades
- Additional Access Roads Scopes of Work
- CCR Upgrades
- Safety Incentive Program
- Procurement of Capital Spares for Operations

11.9 J: Corporate Overhead

Reflects the costs estimated for Owners Team Project Management as discussed in Part B: Owner's Project Management and Other Costs, Section 23.13 – Corporate Administration Costs, Section of [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-EP-ES-0001-01](#).

The corporate overhead was provided by Nalcor Energy and represents the allocation of corporate overhead in supporting the LCP Phase I project execution. This includes office space rent, and corporate support with respect to payroll, accounting services etc.

11.10 K: Commercial Negotiations

Reflects the costs estimated for Commercial and Financing Agreements as discussed in Part B: Owner's Project Management and Other Costs, Section 23.27 – Commercial and Financing Agreements of [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-EP-ES-0001-01](#).

11.11 L: Tax and Audit

Reflects the costs estimated for tax and audit services as discussed in Part B: Owner's Project Management and Other Costs, Section 23.12 – Tax and Audit Support Services of [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-EP-ES-0001-01](#).

11.12 M: IT Life of Project

Reflects the costs estimated for tax and audit services as discussed in Part B: Owner's Project Management and Other Costs, Section 23.8 – Information Systems and Information Technology of [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-EP-ES-0001-01](#).

11.13 N: Environmental Assessment and Aboriginal Affairs

Reflects the costs estimated for tax and audit services as discussed in Part B: Owner's Project Management and Other Costs, Section 23.22 – Environmental Assessment of [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-EP-ES-0001-01](#).

11.14 O: Insurance

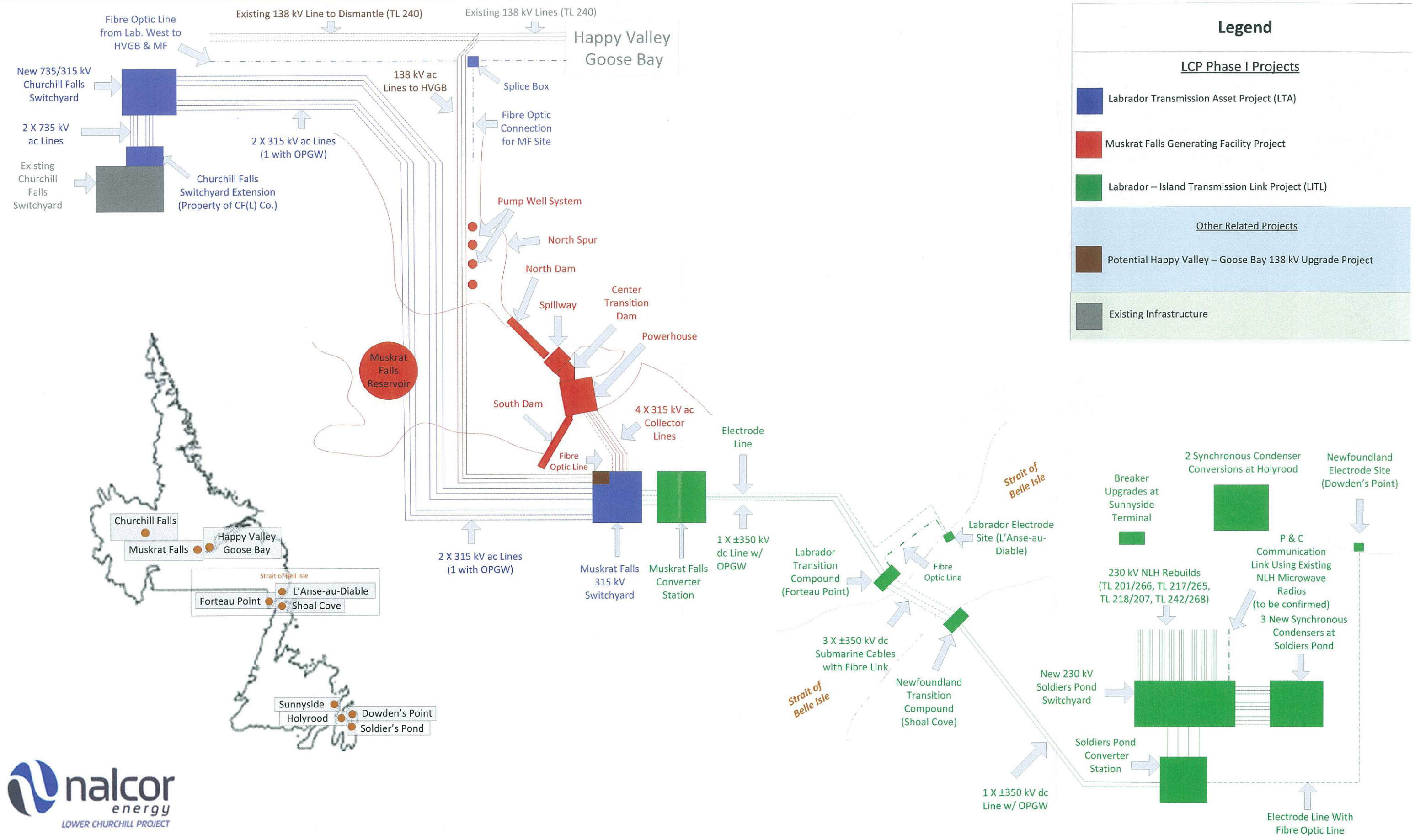
Reflects the costs estimated for tax and audit services as discussed in Part B: Owner's Project Management and Other Costs, Section 23.41 – Insurance of [Decision Gate 3 Basis of Estimate](#), reference no. [LCP-PT-ED-0000-EP-ES-0001-01](#).

The Insurance estimate was provided by AON – Nalcor's Insurance Broker for the Project and was considered a high level estimate covering property, DSU and liability insurance premiums as calculated based on the major scopes of work. Property damage premiums were carried for Muskrat Falls, LTA, LITL and the SOBI Marine crossing scopes of work. Wrap up liability and pollution liability premiums were allocated out to MF, LTA and LITL at 48%, 11% and 41% respectively.

A.0 Activity Flowchart (Excel Format)**A.1. N/A****B.0 Attachments/Appendices****B.1 Lower Churchill Project – Asset Schematic by Project****B.2 Base Estimate Breakdown by Commitment Package and by Physical Component****B.3 Commitment Package Estimates****B.4 Summary Cost Flows – MF, LTA & LITL Combined****B.5 Binder Listing for Supporting CCE Documentation Produced by Nalcor****B.6 Binder Listing for Supporting CCE Documentation Produced by SNC-Lavalin****B.7 Decision Gate 3 CCE and Financial Model Back-up: Volumes 1 – 4**

Attachment B.1

Lower Churchill Project - Asset Schematic by Project



Attachment B.2

Base Estimate Breakdown by Commitment Package and by Physical Component

Muskrat Falls Generation Base Estimate by Commitment Package

A - Muskrat Falls Generation	
A.1 - Accommodation Complex/Admin/Utilities Access Roads/Construction Power	\$166,608,338
CD0512 - Construction of Construction Power Facilities	\$8,973,000
CH0002 - Supply and Install Accommodations Complex Buildings	\$65,267,191
CH0003 - Supply and Install Administrative Buildings	\$8,369,000
CH0004 - Construction of Southside Access Road	\$34,585,885
CH0005 - Supply and Install Accommodations Complex Site Utilities	\$18,017,564
CH0039 - Supply and Install McKenzies River Permanent Bridge	\$2,635,900
CH0048 - Construction of Site Clearing Access Road & Ancillary Areas	\$3,589,830
PD0513 - Supply of 138/25 kV Transformers	\$2,098,005
PD0514 - Supply of 138 kV & 25 kV Circuit Breakers	\$205,100
PD0515 - Supply of 230 kV, 138 kV & 25 kV Disconnect Switches	\$212,480
PD0518 - Supply of 138 kV Capacitor Voltage Transformers	\$25,540
PD0519 - Supply of 25 kV Vacuum Interrupters	\$142,600
PD0520 - Supply of 25 kV 6 x 3.6 MVAR Capacitor Banks	\$207,252
PD0522 - Supply of Pre-fabricated Control Room Building	\$806,701
PD0523 - Supply of Substation Service Transformer	\$18,236
PD0529 - Supply of 25 kV Reclosers	\$62,859
PD0530 - Supply of 138 kV & 25 kV Surge Arrestors	\$41,325
PD0531 - Supply of MV Instrument Transformer	\$55,512
PD0561 - Supply of D20 RTU and Cabinet (CF) - Construction Power	\$50,000
PD0562 - Supply of Specific Relays and Test Switches (CF) - Construction Power	\$100,000
PD0563 - Supply of 138 kV Circuit Switcher (CF), MV Switches & Fuse Cut-outs - Construction Power.	\$117,000
PH0036 - Supply of Auxiliary Transformers	\$469,281
PH0037 - Supply of 25kV Switchgear	\$1,366,952
PH0038 - Supply of Emergency Diesel Generators	\$1,706,125
PT0336 - Supply of 25 kV Distribution Line Hardware	\$490,000
PT0337 - Supply of 25 kV Distribution Line ADSS Fibre Optic Cable	\$460,000
PT0338 - Supply of 25 kV Distribution Line Conductors	\$345,000
PT0339 - Supply of 25 kV Distribution Line Insulators	\$65,000
PT0340 - Supply of Wood Poles for 138/25 kV Distribution Line	\$375,000
XX017 - De-commission of construction Power after construction	\$750,000
XX023 - Muskrat Falls Access Roads (T-Bone intersection) rework at TLH and Camp turn-off	\$2,000,000
XX032 - 7Km of access road (Forestry Bypass)	\$1,000,000
XX033 - Caroline River bridge	\$2,000,000
XX034 - Rehab existing Kenamu Bridge	\$10,000,000
A.2 - Bulk Excavation and Main Civil works for Intake and Powerhouse, Spillway and Transition Dams	\$823,064,224
CH0006 - Construction of Bulk Excavation Works and Associated Civil Works	\$132,970,112
CH0007 - Construction of Intake and Powerhouse, Spillway and Transition Dams	\$687,994,112
SM0713 - Provision of Geotechnical Investigation Services	\$2,000,000
XX016 - FRC during construction	\$100,000
A.3 - North Spur/ North and South Dams/Reservoir Clearing/Habitat Compensation works	\$336,605,489
CH0008 - Construction of North Spur Stabilization Works	\$62,709,810
CH0009 - Construction of North and South Dams	\$117,166,506
CH0023 - Construction of Reservoir Clearing South Bank	\$85,033,860
CH0024 - Construction of Reservoir Clearing North Bank	\$54,045,313
CH0049 - Supply and Install Log Booms	\$7,500,000
CH0052 - Construction of Habitat Compensation Works	\$10,100,000
XX015 - Oil Spill kitsRiver booms deployment kits	\$50,000

Muskrat Falls Generation Base Estimate by Commitment Package

A - Muskrat Falls Generation	
A.4 - T&G's/Powerhouse Mechanical and Electrical Auxiliaries/Hydro Mechanical Equipment/GSU's/ Collector Lines	\$484,012,733
CH0030 - Supply and Install Turbines and Generators	\$200,000,000
CH0031 - Supply and Install Mechanical and Electrical Auxiliaries (MF)	\$91,913,298
CH0032 - Supply and Install Powerhouse Hydro-Mechanical Equipment	\$101,525,168
CH0033 - Supply and Install Powerhouse Cranes	\$8,872,175
CH0034 - Supply and Install Powerhouse Elevator	\$755,300
CH0046 - Supply and Install Spillway Hydro-Mechanical Equipment	\$50,794,781
CT0319 - Construction of 315 kV HVac Transmission Line (MF to CF)	\$3,770,591
PH0014 - Supply of Generator Step-up Transformer	\$19,464,468
PH0015 - Supply of Isolated Phase Bus	\$1,860,952
PH0016 - Supply of Generator Circuit Breakers	\$5,056,000
A.5 - Telecommunications	\$17,298,550
CD0509 - Construction Telecommunication Services - Phase 2	\$13,733,898
CD0510 - Supply and Install Permanent Communication Systems	\$1,908,996
CD0535 - Construction Telecommunication Services - Phase 2 Remote Camps	\$1,030,238
PD0533 - Supply and Install Early Works Telecom Devices	\$317,425
SD0560 - Provision of Early Works Construction Telecommunication Services (MF)	\$307,993
A.6 - Site Services	\$248,312,374
SH0018 - Provision of Catering, Housekeeping and Janitorial Services (MF)	\$114,800,000
SH0019 - Provision of Security Services	\$21,907,250
SH0020 - Provision of Medical Services	\$19,029,000
SH0021 - Provision of Road Maintenance and Snow Clearing Services (MF)	\$8,150,000
SH0022 - Provision of Fuel Supply and Dispensing Services (MF)	\$750,000
SH0040 - Provision of Garbage Removal and Disposal Services (MF)	\$2,500,000
SH0041 - Provision of Ground Transportation Services (HVGB to MF)	\$12,685,680
SH0051 - Provision of Buildings Maintenance Services (MF)	\$24,000,000
SM0704 - Provision of Surveying Services	\$13,261,600
SM0705 - Provision of Laboratory Services	\$31,078,844
XX019 - Nurse station outfitting / first Aid supplies	\$50,000
XX020 - outfitting of emergency response vehicles & team equipment, firefighting equipment, Scott air packs, air compressor, etc...	\$100,000
A.7 - Spares	\$1,500,000
XX026-3 - Muskrat Falls spares	\$1,500,000
Grand Total	\$2,077,401,708

Ties to Table 9-2

LTA Base Estimate by Commitment Package

C - Labrador Transmission Assets	
C.1 - OL Transmission CF-MF	\$288,254,205
CT0319 - Construction of 315 kV HVac Transmission Line (MF to CF)	\$184,345,852
CT0341 - Clearing of Right of Way for 315 kV HVac Transmission Line (MF to CF)	\$29,701,301
PT0300 - Supply of Transmission Line Conductors - 315 kV HVac	\$19,896,000
PT0301 - Supply of HVac Insulators - 315 kV HVac	\$4,792,470
PT0302 - Supply of Steel Towers - 315 kV HVac	\$23,879,000
PT0303 - Supply of Tower Hardware - 315 kV HVac	\$12,133,405
PT0304 - Supply of Optical Ground Wire (OPGW) - 315 kV HVac	\$2,322,860
PT0307 - Supply of Steel Tower Foundations - 315 kV HVac	\$5,514,614
PT0326 - Supply of Steel Wires - 315 kV HVac	\$2,797,761
PT0335 - Supply of Anchor Materials - 315 kV HVac	\$1,920,943
ST0309 - Provision of Geotechnical Investigation Services - 315 kV HVac	\$950,000
C.2 - Switchyards	\$192,087,214
CD0502 - Construction of AC Substations and Synchronous Condensers Facilities	\$60,484,647
CD0503 - Construction of Earthworks at Various Power Distribution Sites	\$17,447,657
CD0538 - Supply and Install Accommodations Camp (CF)	\$17,343,523
CH0006 - Construction of Bulk Excavation Works and Associated Civil Works	\$1,232,708
PD0505 - Supply of Switchyard Equipment, AC Substations at CF, MF and SP	\$71,964,505
PD0537 - Supply of Power Transformers, AC Substations at CF, MF and SP	\$22,814,174
XX013 - Churchill Falls Permit to work (full time position for construction)	\$800,000
C.3 - Telecommunications	\$15,467,507
CD0509 - Construction Telecommunication Services - Phase 2	\$69,024
CD0510 - Supply and Install Permanent Communication Systems	\$5,352,178
CD0535 - Construction Telecommunication Services - Phase 2 Remote Camps	\$2,046,305
XX040 - Fibre optic Line CF-HVGB	\$8,000,000
C.4 - Spares	\$2,960,613
XX026-6 - LTA Spare	\$2,960,613
Grand Total	\$498,769,539

Ties to Table 9-3



LITL Base Estimate by Commitment Package

B - Labrador - Island Transmission Link	
B.1 - Converters/Transition Compounds/Synch Condensers/SP Switchyard	\$639,805,781
CD0501 - Supply and Install Converters and Cable Transition Compounds	\$401,654,399
CD0502 - Construction of AC Substations and Synchronous Condensers Facilities	\$80,571,584
CD0503 - Construction of Earthworks at Various Power Distribution Sites	\$47,820,858
CD0534 - Supply and Install Soldiers Pond Synchronous Condensers	\$74,995,326
CH0006 - Construction of Bulk Excavation Works and Associated Civil Works	\$1,269,129
PD0505 - Supply of Switchyard Equipment, AC Substations at CF, MF and SP	\$23,200,921
PD0537 - Supply of Power Transformers, AC Substations at CF, MF and SP	\$6,689,740
SH0040 - Provision of Garbage Removal and Disposal Services (MF)	\$103,824
XX024 - Soliders Pond Access Road (extension of Foxtrap Access Road)stacking lanes on TCH??	\$3,500,000
B.2 - Electode Sites/Island Upgrades	\$77,613,063
CD0508 - Supply and Install of Electrode Sites	\$27,317,881
CT0342 - Construction of AC Transmission Lines - Island	\$10,815,122
PT0351 - Supply of Wood Poles	\$430,060
XX008 - Sync Condensers-switch over at Holyrood	\$30,800,000
XX009 - Breaker switch out at Bay D'Espoir wherever (18 total???)	\$6,700,000
XX018 - Downton Point park improvements / Trail way reconstruction benches etc.	\$50,000
XX025 - NF Power bury distribution lines due to transimission line	\$1,500,000
B.3 - OL Transmission MF-SP	\$929,045,619
CT0327 - Construction of 350 kV HVdc Transmission Line - Section 1	\$358,988,474
CT0342 - Construction of AC Transmission Lines - Island	\$2,195,000
CT0343 - Clearing of Right of Way for HVdc Transmission Line - Section 1	\$91,825,753
CT0345 - Clearing of Right of Way for HVdc Transmission Line - Section 2	\$53,762,352
CT0346 - Construction of 350 kV HVdc Transmission Line - Section 2	\$167,647,168
PT0308 - Supply of Steel Tower Foundations - 350 kV HVdc	\$23,779,087
PT0328 - Supply of Transmission Line Conductors - 350 kV HVdc	\$82,574,783
PT0329 - Supply of HVdc Insulators - 350 kV HVdc	\$49,928,860
PT0330 - Supply of Steel Towers - 350 kV HVdc	\$61,189,733
PT0331 - Supply of Tower Hardware - 350 kV HVdc	\$6,431,818
PT0334 - Supply of Steel Wires - 350 kV HVdc	\$1,815,840
PT0352 - Supply of Anchor Materials - 350 kV HVdc	\$21,216,830
PT0353 - Supply of Optical Ground Wire (OPGW) - 350 kV HVdc	\$3,889,923
ST0310 - Provision of Geotechnical Investigation Services - 350 kV HVdc	\$3,800,000
B.4 - SOBI Marine Crossing	\$337,440,262
XX003A - Cable Supply / Install - Seabed Leveling	\$6,500,000
XX003B - Cable Supply / Install - Cable Supply (3x)	\$85,730,000
XX003C - Cable Supply / Install - Cable Installation	\$55,314,375
XX003D - Cable Supply / Install - Land Cable Supply and Installation	\$8,481,000
XX003E - Cable Supply / Install - Fiber Optic for Communications	\$17,451,392
XX004A - HDD - Engineering	\$4,394,240
XX004B - HDD - Construction	\$73,600,000
XX004C - HDD - Land trench civil works	\$7,350,000
XX005A - Subsea Rock Installation	\$78,619,255
B.5 - Telecommunications	\$21,433,995
CD0509 - Construction Telecommunication Services - Phase 2	\$69,024
CD0510 - Supply and Install Permanent Communication Systems	\$15,688,478
CD0535 - Construction Telecommunication Services - Phase 2 Remote Camps	\$3,676,493
XX010 - Communications between Soldiers Pond SY and rest of the world...also includes commms to the back up CCR in Holyrood	\$2,000,000
B.6 - Spares	\$6,724,135
XX026-4 - LITL Spares	\$6,724,135
Grand Total	\$2,012,062,855

Ties to Table 9-4

Muskrat Falls Generation Base Estimate by Physical Component

A - Muskrat Falls Generation	
A.1 - Accomodation Complex/Admin/UtilitiesAccess Roads/Construction Power	\$166,608,338
1110 - Access Roads	\$49,561,615
1320 - Construction Power - Muskrat Falls	\$19,142,968
1500 - Accommodation Complex / Temporary Buildings	\$83,384,754
1540 - Buildings - Administration Buildings and Workshops	\$8,269,000
1830 - Offsite Roads and Bridges	\$6,250,000
A.2 - Bulk Excavation and Main Civil works for Intake and Powerhouse, Spillway and Transition Dams	\$823,064,224
0000 - No Physical Component	\$2,100,000
1150 - Construction Bridges (includes spillway and site access temp bridges)	\$8,100,000
2322 - RCC North Abutment	\$1,495,692
2330 - South Dam	\$907,249
2341 - Upstream Cofferdam	\$48,372,725
2342 - Downstream Cofferdam	\$2,744,327
2343 - Riverside Cofferdam	\$10,918,449
2361 - North Transition Structure	\$7,185,589
2362 - Center Transition Structure	\$20,072,290
2363 - South Transition Structure	\$15,411,243
2400 - Spillway - General	\$14,642,191
2410 - Spillway Structure	\$76,758,866
2420 - Gates, Guides Stoplogs and Hoist	\$2,720,012
2430 - Spillway Channels	\$597,946
3000 - Power Facilities	\$40,735,119
3200 - Intake and Penstocks - General	\$51,083,599
3220 - Intake Structure	\$178,716,305
3240 - Intake Gates Trash racks Stoplogs & Hoists	\$5,828,711
3300 - Power House	\$6,067,551
3310 - Substructure	\$289,079,738
3320 - Superstructure	\$38,553,844
3330 - Draft Tube Gates and Hoists	\$972,776
A.3 - North Spur/ North and South Dams/Reservoir Clearing/Habitat Compensation works	\$336,605,489
0000 - No Physical Component	\$50,000
2110 - Reservoir	\$144,079,173
2130 - Trash Management System (including Log Booms)	\$7,500,000
2300 - Dams and Cofferdams - General	\$4,098,067
2320 - North Dam	\$1,137,512
2321 - RCC Dam Prep and Construction	\$75,941,122
2322 - RCC North Abutment	\$1,325,972
2330 - South Dam	\$4,063,756
2341 - Upstream Cofferdam	\$19,000,916
2342 - Downstream Cofferdam	\$360,410
2363 - South Transition Structure	\$6,100,144
2800 - North Spur - General	\$57,709,810
3120 - Tailrace	\$5,138,608
9112 - Fish Habitat Compensation Muskrat Falls	\$10,100,000

Muskrat Falls Generation Base Estimate by Physical Component

A - Muskrat Falls Generation	
A.4 - T&G's/Powerhouse Mechanical and Electrical Auxiliaries/Hydro Mechanical Equipment/GSU's/ Collector Lines	\$484,012,733
2400 - Spillway - General	\$3,163,861
2420 - Gates, Guides Stoplogs and Hoist	\$50,794,781
3240 - Intake Gates Trash racks Stoplogs & Hoists	\$7,656,779
3320 - Superstructure	\$7,819,466
3330 - Draft Tube Gates and Hoists	\$93,868,389
3340 - Building Electrical Services	\$15,782,541
3350 - Building Mechanical Services	\$13,335,025
3360 - Powerhouse Crane	\$8,872,175
3400 - Power Generation	\$8,995,349
3410 - Turbine	\$200,000,000
3420 - Generator	\$7,394,645
3430 - Electrical Ancillary / Auxiliary Systems	\$2,999,701
3431 - DC Power / UPS System	\$1,517,500
3435 - Station Service Transformers	\$1,914,704
3436 - Bus Duct	\$1,860,952
3440 - Mechanical Ancillary / Auxiliary Systems	\$17,554,583
3441 - Service Air System	\$1,162,641
3442 - Governor Air System	\$1,172,654
3443 - Fire Protection System	\$3,732,122
3444 - Pump Drainage System	\$2,695,481
3445 - Pump Dewatering System	\$2,448,322
3446 - Hydraulic Oil Handling and Filtration System	\$862,322
3447 - Oily Water interception System	\$591,758
3448 - Cooling Water System	\$2,438,534
3449 - Service Water System	\$1,599,297
3460 - Generator Transformers	\$19,731,483
3470 - Spare Parts and Special Tools	\$277,079
6160 - Collector Lines Powerhouse to Switchyard	\$3,770,591
A.5 - Telecommunications	\$17,298,550
1420 - Construction Telecommunications - Muskrat Falls	\$15,389,554
9200 - Operations Telecommunications Systems	\$250,000
9220 - Operations Telecommunication System - Muskrat Falls	\$1,658,996
A.6 - Site Services	\$248,312,374
0000 - No Physical Component	\$213,662,374
1570 - Site Services	\$34,650,000
A.7 - Spares	\$1,500,000
0000 - No Physical Component	\$1,500,000
Grand Total	\$2,077,401,708

LTA Base Estimate by Physical Component

C - Labrador Transmission Assets	
C.1 - OL Transmission CF-MF	\$288,254,205
6140 - Muskrat Falls to Churchill Falls	\$286,136,710
6180 - 735 kV AC line at Churchill Falls	\$2,117,495
C.2 - Switchyards	\$192,087,214
1500 - Accommodation Complex / Temporary Buildings	\$7,520,683
1570 - Site Services	\$9,822,840
4000 - Switchyards - General	\$6,898,868
4100 - Churchill Falls Extension	\$113,795,889
4300 - Muskrat Falls Switchyard	\$50,425,661
7520 - 315 kV / 138 kV Switchyard at Muskrat Falls	\$3,623,272
C.3 - Telecommunications	\$15,467,507
1450 - Construction Telecommunications - LTA	\$2,115,329
9250 - Operations Telecommunication System - LTA	\$13,352,178
C.4 - Spares	\$2,960,613
0000 - No Physical Component	\$1,500,000
6140 - Muskrat Falls to Churchill Falls	\$1,460,613
Grand Total	\$498,769,539

LITL Base Estimate by Physical Component

B - Labrador - Island Transmission Link	
B.1 - Converters/Transition Compunds/Synch Condensers/SP Switchyard	\$639,805,781
1110 - Access Roads	\$3,500,000
4500 - Soldiers Pond Switchyard	\$99,132,568
7120 - New Synchronous Condensers	\$110,776,909
8200 - dc Specialties - Converter Stations	\$11,788,175
8210 - Labrador Converter Station	\$179,430,514
8220 - Soldiers Pond Converter Station	\$187,199,083
8500 - dc Specialties - Transition Compounds	\$10,498,800
8510 - Transition Compound - Labrador	\$19,313,421
8520 - Transition Compound - Northern Peninsula	\$18,166,312
B.2 - Electode Sites/Island Upgrades	\$77,613,063
6221 - Island Overland DC Transmission	\$1,500,000
6310 - Electrode Line - Labrador	\$215,030
6320 - Electrode Line - Newfoundland East	\$3,493,381
7110 - Unit Conversion at Holyrood to Synchronous Condensers	\$30,800,000
7130 - Breakers	\$6,700,000
7140 - AC Line Rebuilds	\$7,536,772
8600 - dc Specialties - Electrodes	\$420,745
8610 - Electrode Labrador	\$14,896,752
8620 - Electrode Newfoundland East	\$12,050,384
B.3 - OL Transmission MF-SP	\$929,045,619
6200 - HVdc Overland Transmission	\$3,800,000
6221 - Island Overland DC Transmission	\$532,587,951
6224 - Labrador Overland DC Transmission	\$386,800,163
6310 - Electrode Line - Labrador	\$4,823,487
6320 - Electrode Line - Newfoundland East	\$1,034,018
B.4 - SOBI Marine Crossing	\$337,440,262
8110 - dc Specialties - Marine Crossings - SOBI - General	\$110,000
8111 - SOBI Cables Supply	\$173,366,767
8113 - SOBI Landfall	\$85,344,240
8114 - SOBI Protection	\$78,619,255
B.5 - Telecommunications	\$21,433,995
1430 - Construction Telecommunications - Island Link	\$3,745,517
9200 - Operations Telecommunications Systems	\$2,000,000
9230 - Operations Telecommunication System - Island Link	\$15,688,478
B.6 - Spares	\$6,724,135
0000 - No Physical Component	\$2,000,000
6200 - HVdc Overland Transmission	\$4,724,135
Grand Total	\$2,012,062,855

Attachment B.3

Commitment Packages Estimates

Commitment Package Estimates

	Contract Package ID and Description	Muskkrat Falls Generation Facility (MF)	Labrador - Island Transmission Link (LITL)	Labrador Transmission Asset (LTA)	Total
1	CD0501 - Supply and Install Converters and Cable Transition Compounds		\$401,654,399		\$401,654,399
2	CD0502 - Construction of AC Substations and Synchronous Condensers Facilities		\$80,571,584	\$60,484,647	\$141,056,230
3	CD0503 - Construction of Earthworks at Various Power Distribution Sites		\$47,820,858	\$17,447,657	\$65,268,516
4	CD0508 - Supply and Install of Electrode Sites		\$27,317,881		\$27,317,881
5	CD0509 - Construction Telecommunication Services - Phase 2	\$13,733,898	\$69,024	\$69,024	\$13,871,946
6	CD0510 - Supply and Install Permanent Communication Systems	\$1,908,996	\$15,688,478	\$5,352,178	\$22,949,652
7	CD0512 - Construction of Construction Power Facilities	\$8,973,000			\$8,973,000
8	CD0534 - Supply and Install Soldiers Pond Synchronous Condensers		\$74,995,326		\$74,995,326
9	CD0535 - Construction Telecommunication Services - Phase 2 Remote Camps	\$1,030,238	\$3,676,493	\$2,046,305	\$6,753,036
10	CD0538 - Supply and Install Accommodations Camp (CF)			\$17,343,523	\$17,343,523
11	CH0002 - Supply and Install Accommodations Complex Buildings	\$65,267,191			\$65,267,191
12	CH0003 - Supply and Install Administrative Buildings	\$8,369,000			\$8,369,000
13	CH0004 - Construction of Southside Access Road	\$34,585,885			\$34,585,885
14	CH0005 - Supply and Install Accommodations Complex Site Utilities	\$18,017,564			\$18,017,564
15	CH0006 - Construction of Bulk Excavation Works and Associated Civil Works	\$132,970,112	\$1,269,129	\$1,232,708	\$135,471,949
16	CH0007 - Construction of Intake and Powerhouse, Spillway and Transition Dams	\$687,994,112			\$687,994,112
17	CH0008 - Construction of North Spur Stabilization Works	\$62,709,810			\$62,709,810
18	CH0009 - Construction of North and South Dams	\$117,166,506			\$117,166,506
19	CH0023 - Construction of Reservoir Clearing South Bank	\$85,033,860			\$85,033,860
20	CH0024 - Construction of Reservoir Clearing North Bank	\$54,045,313			\$54,045,313
21	CH0030 - Supply and Install Turbines and Generators	\$200,000,000			\$200,000,000
22	CH0031 - Supply and Install Mechanical and Electrical Auxiliaries (MF)	\$91,913,298			\$91,913,298
23	CH0032 - Supply and Install Powerhouse Hydro-Mechanical Equipment	\$101,525,168			\$101,525,168
24	CH0033 - Supply and Install Powerhouse Cranes	\$8,872,175			\$8,872,175
25	CH0034 - Supply and Install Powerhouse Elevator	\$755,300			\$755,300
26	CH0039 - Supply and Install McKenzies River Permanent Bridge	\$2,635,900			\$2,635,900
27	CH0046 - Supply and Install Spillway Hydro-Mechanical Equipment	\$50,794,781			\$50,794,781
28	CH0048 - Construction of Site Clearing Access Road & Ancillary Areas	\$3,589,830			\$3,589,830
29	CH0049 - Supply and Install Log Booms	\$7,500,000			\$7,500,000
30	CH0052 - Construction of Habitat Compensation Works	\$10,100,000			\$10,100,000
31	CT0319 - Construction of 315 kV HVac Transmission Line (MF to CF)	\$3,770,591		\$184,345,852	\$188,116,443
32	CT0327 - Construction of 350 kV HVdc Transmission Line - Section 1		\$358,988,474		\$358,988,474
33	CT0341 - Clearing of Right of Way for 315 kV HVac Transmission Line (MF to CF)			\$29,701,301	\$29,701,301
34	CT0342 - Construction of AC Transmission Lines - Island		\$13,010,122		\$13,010,122
35	CT0343 - Clearing of Right of Way for HVdc Transmission Line - Section 1		\$91,825,753		\$91,825,753
36	CT0345 - Clearing of Right of Way for HVdc Transmission Line - Section 2		\$53,762,352		\$53,762,352
37	CT0346 - Construction of 350 kV HVdc Transmission Line - Section 2		\$167,647,168		\$167,647,168
38	PD0505 - Supply of Switchyard Equipment, AC Substations at CF, MF and SP		\$23,200,921	\$71,964,505	\$95,165,426
39	PD0513 - Supply of 138/25 kV Transformers	\$2,098,005			\$2,098,005
40	PD0514 - Supply of 138 kV & 25 kV Circuit Breakers	\$205,100			\$205,100
41	PD0515 - Supply of 230 kV, 138 kV & 25 kV Disconnect Switches	\$212,480			\$212,480
42	PD0518 - Supply of 138 kV Capacitor Voltage Transformers	\$25,540			\$25,540
43	PD0519 - Supply of 25 kV Vacuum Interrupters	\$142,600			\$142,600
44	PD0520 - Supply of 25 kV 6 x 3.6 MVAR Capacitor Banks	\$207,252			\$207,252
45	PD0522 - Supply of Pre-fabricated Control Room Building	\$806,701			\$806,701
46	PD0523 - Supply of Substation Service Transformer	\$18,236			\$18,236
47	PD0529 - Supply of 25 kV Reclosers	\$62,859			\$62,859
48	PD0530 - Supply of 138 kV & 25 kV Surge Arrestors	\$41,325			\$41,325
49	PD0531 - Supply of MV Instrument Transformer	\$55,512			\$55,512
50	PD0533 - Supply and Install Early Works Telecom Devices	\$317,425			\$317,425

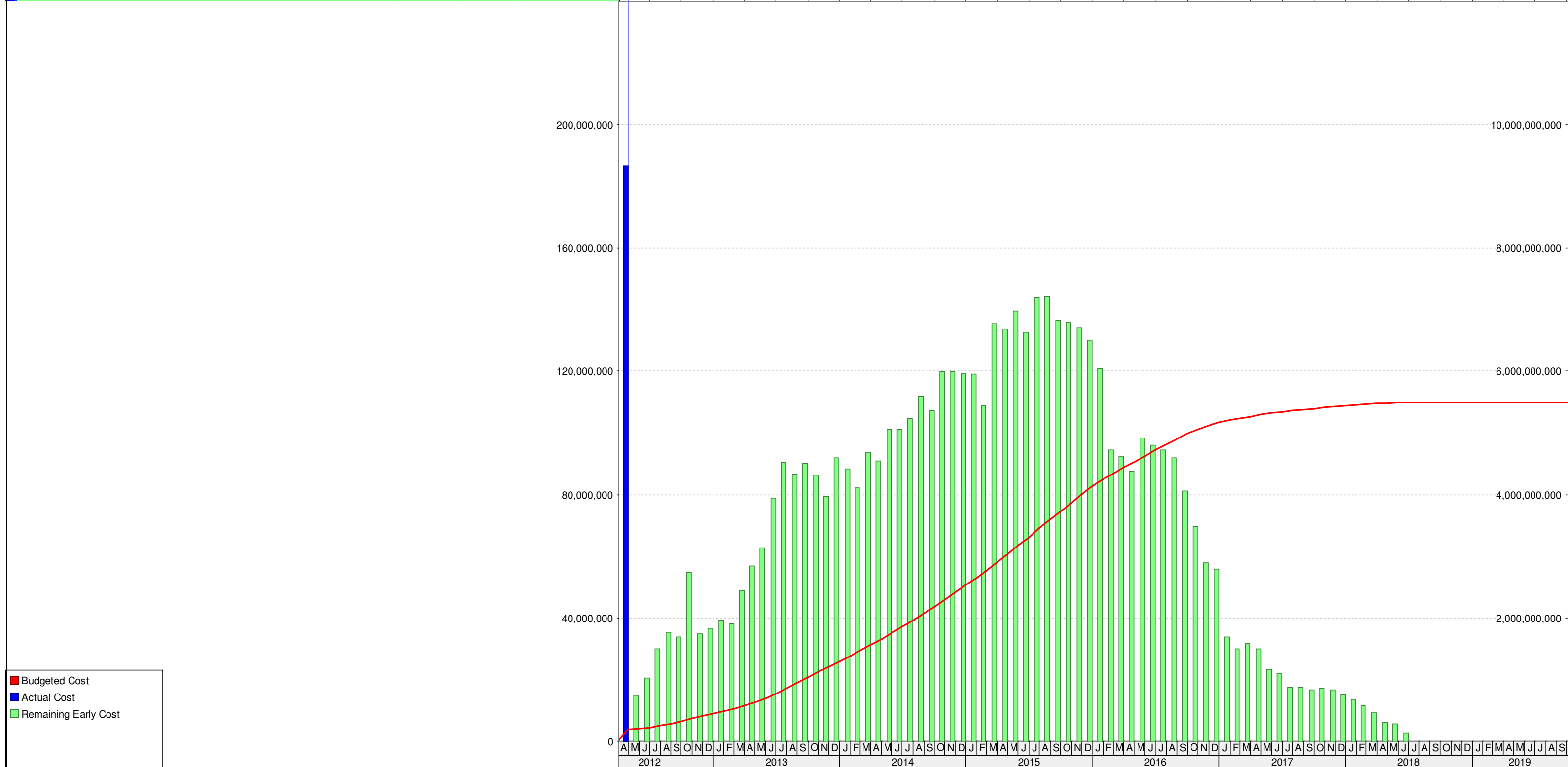
Commitment Package Estimates

	Contract Package ID and Description	Muskat Falls Generation Facility (MF)	Labrador - Island Transmission Link (LITL)	Labrador Transmission Asset (LTA)	Total
51	PD0537 - Supply of Power Transformers, AC Substations at CF, MF and SP		\$6,689,740	\$22,814,174	\$29,503,913
52	PD0561 - Supply of D20 RTU and Cabinet (CF) - Construction Power	\$50,000			\$50,000
53	PD0562 - Supply of Specific Relays and Test Switches (CF) - Construction Power	\$100,000			\$100,000
54	PD0563 - Supply of 138 kV Circuit Switcher(CF),MV Switches/Fuse Cut-outs - Const. Power.	\$117,000			\$117,000
55	PH0014 - Supply of Generator Step-up Transformer	\$19,464,468			\$19,464,468
56	PH0015 - Supply of Isolated Phase Bus	\$1,860,952			\$1,860,952
57	PH0016 - Supply of Generator Circuit Breakers	\$5,056,000			\$5,056,000
58	PH0036 - Supply of Auxiliary Transformers	\$469,281			\$469,281
59	PH0037 - Supply of 25kV Switchgear	\$1,366,952			\$1,366,952
60	PH0038 - Supply of Emergency Diesel Generators	\$1,706,125			\$1,706,125
61	PT0300 - Supply of Transmission Line Conductors - 315 kV HVac			\$19,896,000	\$19,896,000
62	PT0301 - Supply of HVac Insulators - 315 kV HVac			\$4,792,470	\$4,792,470
63	PT0302 - Supply of Steel Towers - 315 kV HVac			\$23,879,000	\$23,879,000
64	PT0303 - Supply of Tower Hardware - 315 kV HVac			\$12,133,405	\$12,133,405
65	PT0304 - Supply of Optical Ground Wire (OPGW) - 315 kV HVac			\$2,322,860	\$2,322,860
66	PT0307 - Supply of Steel Tower Foundations - 315 kV HVac			\$5,514,614	\$5,514,614
67	PT0308 - Supply of Steel Tower Foundations - 350 kV HVdc		\$23,779,087		\$23,779,087
68	PT0326 - Supply of Steel Wires - 315 kV HVac			\$2,797,761	\$2,797,761
69	PT0328 - Supply of Transmission Line Conductors - 350 kV HVdc		\$82,574,783		\$82,574,783
70	PT0329 - Supply of HVdc Insulators - 350 kV HVdc		\$49,928,860		\$49,928,860
71	PT0330 - Supply of Steel Towers - 350 kV HVdc		\$61,189,733		\$61,189,733
72	PT0331 - Supply of Tower Hardware - 350 kV HVdc		\$6,431,818		\$6,431,818
73	PT0334 - Supply of Steel Wires - 350 kV HVdc		\$1,815,840		\$1,815,840
74	PT0335 - Supply of Anchor Materials - 315 kV HVac			\$1,920,943	\$1,920,943
75	PT0336 - Supply of 25 kV Distribution Line Hardware	\$490,000			\$490,000
76	PT0337 - Supply of 25 kV Distribution Line ADSS Fibre Optic Cable	\$460,000			\$460,000
77	PT0338 - Supply of 25 kV Distribution Line Conductors	\$345,000			\$345,000
78	PT0339 - Supply of 25 kV Distribution Line Insulators	\$65,000			\$65,000
79	PT0340 - Supply of Wood Poles for 138/25 kV Distribution Line	\$375,000			\$375,000
80	PT0351 - Supply of Wood Poles		\$430,060		\$430,060
81	PT0352 - Supply of Anchor Materials - 350 kV HVdc		\$21,216,830		\$21,216,830
82	PT0353 - Supply of Optical Ground Wire (OPGW) - 350 kV HVdc		\$3,889,923		\$3,889,923
83	SD0536 - Provision of Integrated Commissioning Support Services	\$1,950,000	\$3,053,762	\$9,372,938	\$14,376,700
84	SD0560 - Provision of Early Works Construction Telecommunication Services (MF)	\$307,993			\$307,993
85	SH0018 - Provision of Catering, Housekeeping and Janitorial Services (MF)	\$114,800,000			\$114,800,000
86	SH0019 - Provision of Security Services	\$21,907,250			\$21,907,250
87	SH0020 - Provision of Medical Services	\$19,029,000			\$19,029,000
88	SH0021 - Provision of Road Maintenance and Snow Clearing Services (MF)	\$8,150,000			\$8,150,000
89	SH0022 - Provision of Fuel Supply and Dispensing Services (MF)	\$750,000			\$750,000
90	SH0040 - Provision of Garbage Removal and Disposal Services (MF)	\$2,500,000			\$2,500,000
91	SH0041 - Provision of Ground Transportation Services (HVGB to MF)	\$12,685,680			\$12,685,680
92	SH0051 - Provision of Buildings Maintenance Services (MF)	\$24,000,000			\$24,000,000
93	SM0700 - Provision of General Freight Forwarding Services	\$2,500,000	\$7,000,000	\$500,000	\$10,000,000
94	SM0701 - Provision of Third Party Quality Surveillance & Inspection Services	\$2,200,000	\$1,100,000	\$1,100,000	\$4,400,000
95	SM0703 - Provision of Happy Valley-Goose Bay Project Office Space	\$480,000			\$480,000
96	SM0704 - Provision of Surveying Services	\$13,261,600			\$13,261,600
97	SM0705 - Provision of Laboratory Services	\$31,078,844			\$31,078,844
98	SM0706 - Supply and Maintenance of Project Vehicles	\$2,303,000	\$822,500	\$164,500	\$3,290,000
99	SM0707 - Provision of Helicopter Services	\$3,388,750	\$9,488,500	\$677,750	\$13,555,000
100	SM0710 - Supply and Maintenance of various IT Equipment	\$2,000,000			\$2,000,000
101	SM0713 - Provision of Geotechnical Investigation Services	\$2,000,000			\$2,000,000
102	ST0309 - Provision of Geotechnical Investigation Services - 315 kV HVac			\$950,000	\$950,000
103	ST0310 - Provision of Geotechnical Investigation Services - 350 kV HVdc		\$3,800,000		\$3,800,000
104	ZZ0999 - Unallocated SOW	\$10,000,000	\$4,827,959	\$1,460,613	\$16,288,572
105	Grand Total	\$2,084,673,458	\$1,649,537,355	\$500,284,727	\$4,234,495,540

Attachment B.4

Summary Cost Flows – MF, LTA & LITL Combined

Filter: TASK filter: All Activities

[illegible]






Remaining Level of Effort
 Remaining Work
 Actual Work

 Milestone

Page 1 of 1

TASK filter: All Activities
 Resource Profile Filter: ESC_AirTravel.Air Travel (ESCALATION CUSETG01NS), ESC_Marine.Cable Laying Vessels, ESC_CementProd.Cement Products (ESCALATION V1575794), ESC_Concrete.Concrete

Filter: TASK filter: All Activities

 Remaining Level of Effort  Remaining Work  Actual Work   Milestone	Page 1 of 2	TASK filter: All Activities Resource Profile Filter: ESC_AirTravel.Air Travel (ESCALATION CUSETG01NS), ESC_Marine.Cable Laying Vessels, ESC_CementProd.Cement Products (ESCALATION V1575794), ESC_Concrete.Concrete
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Filter: TASK filter: All Activities

Legend:

- Budgeted Cost (Red line)
- Actual Cost (Blue bar)
- Remaining Early Cost (Green bars)

The chart displays the following data series:

- Budgeted Cost:** A red line showing a steady increase from approximately 10,000,000 in April 2012 to about 5,000,000,000 in April 2019.
- Actual Cost:** A single blue bar in April 2012, reaching approximately 180,000,000.
- Remaining Early Cost:** Green bars representing the difference between budgeted and actual costs. The values fluctuate significantly, with peaks around 100,000,000 in late 2013 and late 2015, and a general downward trend towards the end of the period.

Attachment B.5

Binder Listing for Supporting CCE Documentation Produced by Nalcor

Listing of Binders Available for Reference

1. Owner's Team Overview, Organization and Gantt Charts
2. Estimate for Cost for EPCM Services
3. Other Owner's Cost
4. Island System Upgrades

Attachment B.6

Binder Listing for Supporting CCE Documentation Produced by SNC-Lavalin



Lower Churchill Project DG3 Capital Cost Estimate

Document was updated in July
2012, rather than 2011

Date: 26-July-2011

Binders Listing of DG3 Estimate & Background Information



SNC • LAVALIN



Lower Churchill Project
DG3 Capital Cost Estimate

Date : July 26, 2012

Binders Listing of DG3 Estimate and background information

Binder	Table Job Status	Cover Status	Location Status	Title Volume	Description	Notes
1	ok	ok	Est. Team	As Description	Vol 1/13 Detailed Capital Cost Estimate	
2	ok	ok	Est. Team	As Description	Vol 2/13 Detailed Capital Cost Estimate	
3	ok	ok	Est. Team	As Description	Vol 3/13 Detailed Capital Cost Estimate	
4	ok	ok	Est. Team	As Description	Vol 4/13 Back-up Information for Vol 1-3	
5	ok	ok	Est. Team	As Description	Vol 5/13 Back-up Information for Vol 1-3	
6	ok	ok	Est. Team	As Description	Vol 6/13 Back-up Information for Vol 1-3	
7	ok	ok	Est. Team	As Description	Vol 7/13 Back-up Information for Vol 1-3	
8	ok	ok	Est. Team	As Description	Vol 8/13 Back-up Information for Vol 1-3	
9	ok	ok	Est. Team	As Description	Vol 9/13 Back-up Information for Vol 1-3	
10	ok	ok	Est. Team	As Description	Vol 10/13 Back-up Information for Vol 1-3	
11	ok	ok	Est. Team	As Description	Vol 11/13 Detailed Capital Cost Estimate	
12	ok	ok	Est. Team	As Description	Vol 12/13 Detailed Capital Cost Estimate	
13	ok	ok	Est. Team	As Description	Vol 13/13 Detailed Capital Cost Estimate	
14	ok	ok	Est. Team	As Description	DG3 Capital Cost Estimate Basis of Estimate Report	
15	ok	ok	Est. Team	As Description	C1 Pricing List	
16	ok	ok	Est. Team	As Description	C3 Pricing List	
17	ok	ok	Est. Team	As Description	C4 Pricing List	
18	ok	ok	Est. Team	Bill of Quantities - Powerhouse and Spillway for Cost Estimate	Component 1 - Generation CATIA Models for Basis Estimate Bill of Quantities - Powerhouse and Spillway for Cost Estimate	
19	ok	ok	Est. Team	Basis of Quantification Component C3:	Basis of Quantification December 2011 Class 3 Component C3: DC Specialties Earthworks - Civil Concrete/Steel Building	
20	ok	ok	Est. Team	Engineering Basis of Quantification Reports - C3	Engineering Quantity Bases: Construction of Earthworks at Various Power Distribution Sites Engineering Quantity Bases: Construction of Earthworks at Various Power Distribution Sites - Back up Drawings	



Lower Churchill Project
DG3 Capital Cost Estimate

Date : July 26, 2012

Binders Listing of DG3 Estimate and background information

Binder	Table Job Status	Cover Status	Location Status	Title Volume	Description	Notes
21	ok	ok	Est. Team	Engineering Basis of Quantification Reports - C1	Engineering Quantity Tracking CH0006 - Bulk Excavation	
					Engineering Quantity Tracking CH0007 - Intake and Powerhouse, Spillway and Transition Dams	
					Engineering Quantity Basis Access Roads for North Spur Pits and Quarries	
					Strengthening of Kenamu and Paradise River Bridges	
					Engineering Quantity Basis CH0039 - McKenzies River Bridge	
					Engineering Quantity Basis CH0004 - South Side Access Road	
					Engineering Quantity Basis CH0002 - Accommodations Complex Buildings	
					Engineering Quantity Basis CH0003 - Accommodations Complex Administrative Buildings	
					Engineering Quantity Basis CH0005 - Accommodation Complex Site Utilities	
					Engineering Quantity Basis	
					SH0021 - Provision of road maintenance and snow clearing devices (MF)	
					SH0022 - Provision of fuel supply and dispensing services (MF)	
					SH0040 - Provision of garbage removal and dispensing services (MF)	
					SH0040 - Provision of Ground Transportation services (HVGB to MF)	
					SH0051 - Provision of buildings maintenance services (MF)	
					Engineering Quantity Basis CH0048 - Site Clearing Access Road and Ancillary Areas	
					CH0047 Design, Supply and Installation of Trash Cleaning System	
					Engineering Quantity Tracking	
					SH0019 - Provision of security services	
					SH0020 - Provision of medical services	
					Engineering Quantity Tracking	
					CH0023 - Reservoir Clearing South Bank	
					CH0024 - Reservoir Clearing North Bank	
					Engineering Quantity Tracking CH0008 - North Spur Stabilization Works	
					Engineering Quantity Tracking CH0009 - RCC Dams and river cofferdams	
					Engineering Quantity Tracking CH0032 - Powerhouse Hydromechanical	
					Engineering Quantity Tracking CH0046 - Spillway Hydromechanical	
					Engineering Quantity Tracking CH0033 - Supply and install powerhouse cranes	
					Engineering Quantity Tracking CH0034 - Supply and installation of powerhouse elevator	
					Engineering Quantity Tracking CH0030 - Design, supply and installation of turbines and generators	
					Engineering Quantity Tracking CH0031 Supply and Installation of mechanical and electrical auxiliaries	
					Engineering Quantity Tracking	
					CH0031 - Supply and installation of mechanical and electrical auxiliaries	
					PH0014 - Generator Step-up transformers	
					PH0015 - Isolated phase bus	
					PH0016 - Generator Circuit Breakers	
					PH0035 - Station auxiliary service transformers	
					Engineering Quantity Tracking PH0036 - Accommodations and Construction Site Distribution System - Auxiliary Transformers	
					Engineering Quantity Tracking PH0037 - Accommodation and Construction Site 25 kV Switchgear	
					Engineering Quantity Tracking PH0038 - Accommodation and Construction site diesel generators	
					Engineering Quantity Tracking CH0049 - Supply and Install Log Booms - incl Drawing	
					Clearing Estimation Costs - Hvac Lines	
					Clearing Estimation Costs - Hvdc Lines	
22	ok	ok	Est. Team	Engineering Basis of Quantification Reports - C4	Engineering Quantity Tracking 350kV HVdc Muskrat Falls to Soldiers Pond Transmission Lines	
					Engineering Quantity Tracking 351kV HVac Muskrat Falls to Soldiers Pond Transmission Lines	



Lower Churchill Project
DG3 Capital Cost Estimate

Date : July 26, 2012

Binders Listing of DG3 Estimate and background information

Binder	Table Job Status	Cover Status	Location Status	Title Volume	Description	Notes
23	ok	ok	Est. Team	Technical Documents issued by SNC-Lavalin	Telecommunication System Telecommunication Study - Early Works Constuction Phase Technical Report Telecommunication Devices Early Works Construction Phase - Scope Specification Telecommunication System Design Basis Construction Phase Telecommunication System Permanent Phase Design Brief	NO SCAN
24	ok	ok	Est. Team	Engineering Technical Documents - C1	Master Equipment List HVAC Equipment List Piping Equipment List Spillway Equipment List Heavy Mechanical Equipment List 315kV HVac Geotechnical Baseline Muskrat Falls to Churchill Falls	
25	ok	ok	Est. Team	Bulk Excavation and Backfilled Structures C.G.C. "Project" Copy	Bulk Excavation and Backfilled Structures C.G.C. "Project" Copy	
26	ok	ok	Est. Team	C3 - Equipment Pricing List (AC Switchyards only)	Muskrat Falls Generating Facility Labrador-Island Transmission Link Labrador Transmission Assets DG3 Estimate - HVdc Specialities	
27	ok	ok	Est. Team	Package Dictionaries: Date 1-Feb-12	Package Dictionaries: Date 1-Feb-12	
28	ok	ok	Est. Team	As Description	C1 - Preparation Reservoir Estimate	
29	ok	ok	Est. Team	As Description	C1 - HCSS Cost Reports (26 March 2012)	NO SCAN
30	ok	ok	Est. Team	As Description	C1 - Powerhouse & Spillway : Drawings and Take off Quantities C3 - Switchyards & Substations - BOQ : Civil, Concrete, Steel & Building	
31	ok	ok	Est. Team	As Description	C3 - DC Specialities (Vol 1 of 2) Short-Form Technical Specification & Budget Price Equipments	
32	ok	ok	Est. Team	As Description	C3 - DC Specialities (Vol 2 of 2) Short-Form Technical Specification & Budget Price Equipments	
33	ok	ok	Est. Team	Following up Budgetary Prices	Following up Budgetary Prices WORKING DOCUMENT	
34	ok	ok	Est. Team	Following up Packages	Following up Packages WORKING DOCUMENT (No Table of Contents)	NO SCAN
35	ok	ok	Est. Team	As Description	C3 - Updated Estimates : Civil and Mechanical Works	
36	ok	ok	Est. Team	As Description	C3 - Updated Estimates : Electrical Works	
37	ok	ok	Est. Team	As Description	C3 - Updated Estimates : Detailed Modification in HCSS-PKL5	
38	ok	ok	Est. Team	As Description	C3 - Updated Estimates : Breakdown tables	
39	ok	ok	Est. Team	As Description	C3 - Updated Estimates : Summary Tables	
40	ok	ok	Est. Team	As Description	C4 - HCSS Reports of Direct Costs by Activity - PKL4T Version (All Packages) & Backup CD including All worksheet Excel files	
41	ok	ok	Est. Team	As Description	Followed Action Items for Scope of Packages (C1, C3, C4)	
42	ok	ok	Est. Team	As Description	LCP : Drawings and Equipment Listings	



Lower Churchill Project DG3 Capital Cost Estimate

SLI Document No. 505573-0000-33RA-I-002

Nalcor Reference No. LCP-SN-CD-0000-EP-ES-0001-01

Date: 15-Dec-2011

Revision 00

Table of Contents

Detailed Capital Cost Estimate (VOLUMES 1, 2 AND 3)

Session	Component	Physical Components
Volume 1		
		EPCM Costs
S1 -	C1	Mass excavation
	C1	RCC Structures
	C1	Fill Structures
	C1	Quotations
Volume 2		
S2 -	C1	Structural Concrete
	C1	Structural steel
	C1	Architecture
	C1	Quotations
S3 -	C1	Power Generation
	C1	Hydro-Mechanical
	C1	Quotations
	C1	Mechanical and Electrical Auxiliaries
S4 -	C3	DC - Specialties
	C3	Civil & Mechanical Works
	C3	Churchill falls - AC Switchyard
	C3	Muskrat Falls - AC Main Station
	C3	Muskrat Falls - TAP Station
	C3	Muskrat Falls - Converter Station
	C3	Soldiers Pond - Converter Station
	C3	Soldiers Pond - AC Switchyard
	C3	Soldiers Pond - Synchronous Condenser
	C3	Forteau Point - Transition Compound
	C3	Shoal Cove - Transition Compound
	C3	Major equipments and piping - All Stations & Switchyards
	C3	Unit Costs and Quantities



Lower Churchill Project

DG3 Capital Cost Estimate

SLI Document No. 505573-0000-33RA-I-002

Nalcor Reference No. LCP-SN-CD-0000-EP-ES-0001-01

Date: 15-Dec-2011

Revision 00

Table of Contents

Detailed Capital Cost Estimate (VOLUMES 1, 2 AND 3)

Session	Component	Physical Components
Volume 3		
S5 -	C4	AC & DC Transmission Lines
	C4	AC Transmission Lines
	C4	AC TL - ROW Clearing
	C4	AC TL - Construction Lines
	C4	DC Transmission Lines
	C4	DC TL - ROW Clearing
	C4	DC TL1 - Labrador segment
	C4	DC TL2 - SOBI & LRM Segment
	C4	DC TL3 - Newfoundland Interior Segment
	C4	DC TL4 - Newfoundland Eastern Segment
	C4	Stations & Switchyards
	C4	Churchill falls 735 kV
	C4	Muskrat Falls 315 kV
	C4	Seg. 4 Crossing 230 kV
	C4	Soldiers pond 230 kV
	C4	Electrode - Labrador
	C4	Electrode - Newfoundland
	C4	Quotations C4 : AC/DC TL
S6 -	C1	Reservoir Clearing
	C1	Access and Bridges
	General	Marshalling Yards
	C1	Camp Facilities (Muskrat Falls)
	General	Safety and Medical
S7 -	C3 & C4	Camp Facilities (Remote Camps)
		General Indirect Costs
	C1	Camp Operation & Air Travel
	C3 & C4	Camp Operation & Air Travel



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	C1	RCC Structures
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	C1	Quotations
S2 -	C1	Structural Concrete
	C1	Structural steel
	C1	Architecture
	C1	Quotations
S3 -	C1	Power Generation
	C1	Hydro-Mechanical
	C1	Quotations
	C1	Mechanical and Electrical Auxiliaries
Volume 5		
S4 -	C3	DC - Specialties
	C3	Civil & Mechanical Works
	C3	Churchill falls - AC Switchyard
	C3	Muskrat Falls - AC Main Station
	C3	Muskrat Falls - TAP Station
	C3	Muskrat Falls - Converter Station
	C3	Soldiers Pond - Converter Station
	C3	Soldiers Pond - AC Switchyard
	C3	Soldiers Pond - Synchronous Condenser
	C3	Forteau Point - Transition Compound
	C3	Shoal Cove - Transition Compound
	C3	Major equipments and piping - All Stations & Switchyards
	C3	Unit Costs and Quantities



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	C3	Muskrat Falls - Switchyard
	C3	Muskrat Falls - TAP Station
	C3	Muskrat Falls & Soldiers Pond - Converter Station
	C3	Soldiers Pond - AC Switchyard
	C3	Soldiers Pond - Synchronous Condenser
	C3	Forteau Point & Shoal Cove - Transition Compound
	C3	L'Anse du Diable & Dowden's Point - Electrodes
	C3	Line Protection panels (Holy rood, West Avalon, Oxen pond & Hardwoods)
	C3	Comparative Table of Budgetary Costs (Electrical Equipments)
	C3	Quotations
Volume 7		
S4 -	C3	Telecom (Phases : 1, 2, 3)
Volume 8		
S5 -	C4	AC & DC Transmission Lines
	C4	AC Transmission Lines
	C4	AC TL - ROW Clearing
	C4	AC TL - Construction Lines
	C4	DC Transmission Lines
	C4	DC TL - ROW Clearing
	C4	DC TL1 - Labrador segment
Volume 9		
S5 -	C4	DC TL2 - SOBI & LRM Segment
	C4	DC TL3 - Newfoundland Interior Segment



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S5 -	C4	DC TL4 - Newfoundland Eastern Segment
	C4	Stations & Switchyards
	C4	Churchill falls 735 kV
	C4	Muskrat Falls 315 kV
	C4	Seg. 4 Crossing 230 kV
	C4	Soldiers pond 230 kV
	C4	Electrode - Labrador
	C4	Electrode - Newfoundland
	C4	Quotations C4 : AC/DC TL
S6 -	C1	Reservoir Clearing
	C1	Access and Bridges
	General	Marshalling Yards
	C1	Camp Facilities (Muskrat Falls)
	General	Safety and Medical
S7 -	C3 & C4	Camp Facilities (Remote Camps)
		General Indirect Costs
	C1	Camp Operation & Air Travel
	C3 & C4	Camp Operation & Air Travel

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Project	Description
Volume 11	
3000	Muskrat Falls - Generation
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4000	Labrador-Island Transmission Link
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6000	Labrador Trans Asset



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Volume IV	COMPONENT 4 Detailed Estimate Assumptions



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C1	Mass Exc / Fill structures
C1	Structual Concrete
C1	Structual Steel
C1	Hydro-Mechanical Spillway
C1	Hydro-Mechanical Powerhouse
C1	Power generation
C1	Miscellaneous
C1	Balance of Plant - Electrical
C1	Balance of Plant - Mechanical



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C3	Instrument Transformer
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C3	Ground Transformers & Reactors
C3	MV Metal-Clad Switchgear
C3	LV Switchgear & Dist Panels
C3	Battery & Chargers
C3	Post Insulators
C3	MV XLPE Cables
C3	Protection & Control Panels
C3	Electrode Elem & Lead Cables
C3	Bare Conductors & Bus Work
C3	Junction Box
C3	Lighting Fixture
C3	Synchronous Condenser
C3	HVDC Converter
C3	Transition Compound
C3	OH Cranes



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C4	Engineering Qunatity Tracking - 350 kV HVdc TL
C4	BT0300 Conducyor for AC
C4	Alacn
C4	Apar Industries
C4	Far East cable
C4	Midal
C4	Southwire
C4	ZTT cable
C4	BT0301
C4	BT0301 Insulators for AC
C4	NKG
C4	Seves
C4	BT0301 Tower Steel for AC
C4	Gammon India
C4	HD Supply
C4	Jyotis Americas
C4	Kalpaturu Power
C4	KEC International
C4	Locweld
C4	Mitas energy
C4	SAE Tower
C4	Sa-Ra
C4	Thomas & Bets
C4	Zamil steel
C4	ZSG
C4	BT0303 Hardware for AC
C4	HD Supply
C4	Hubell power system
C4	Mosdorfer
C4	BT0304 OPGW for AC
C4	AFL
C4	Graybar
C4	HD Supply
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C4	Suzhou furukawa
C4	BT0326 Steel wire for AC
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C4	HD Supply
C4	Maanshan dingtai
C4	Southwire
C4	Wire rope
C4	BT0328 Conductor for DC
C4	Alcan cable
C4	Apar Industries
C4	Midal
C4	Southwire
C4	ZTT cable
C4	Far East cable
C4	BT0329 Insulators for DC
C4	Seves
C4	BT0331 hardware for DC
C4	HD Supply
C4	Mosdorfer
C4	Preformed Line
C4	Salvi-cicame energy
C4	BT0334 opgw for DC
C4	AFL
C4	HD Supply
C4	Preformed Line
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C4	Dywidag
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C4	Williams form



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C1	2 Quantities provided by engineering
C1	3 Powerhouse and intake : Quantity take-off - concrete
C1	4 Powerhouse and intake : Quantity take-off - forwork
C1	5 Service bay and transition section : quantity take-off
C1	6 Powerhouse and intake : calculations
C1	7 Powerhouse and intake : structural steel quantity take-off
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C1	9 Powerhouse and spillway - civil works spec
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C1	Appendix A
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C3	CD0508 Electrode Ponds
C3	CD0534 Electro - mechanical
C3	PD0533 SD0560 Telecom
C3	CD0509 CD0535 Telecom
C3	CD0510 Telecom
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C3	CD0538 camp



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C1	Engineering Quantity Tracking - Structures (Fill & RCC)
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C1	CH0003 - Administrative Buildings
C1	CH0004 - South side Access Road
C1	CH0005 - Accommodations Complex Site Utilities
C1	CH0006 - Bulk Excavation Works
C1	CH0007 - Intake and Powerhouse, Spillway and Transition Dams
C1	CH0008 - North Spur Stabilization Works
C1	CH0009 - RCC dams & river Dams
C1	CH0023/CH0024 - Reservoir Clearing South Bank / North Bank
C1	CH0030 - Desing, Supply and Install Turbines and Generators
C1	CH0031 - Supply and Install Mechanical and Electrical Auxiliaries (MF)
C1	CH0031 - Drawings supporting the Supply & Install Mechanical & Electrical Aux.
C1	CH0032 - Powerhouse Hydro-Mechanical Equipment
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C1	CH0046 - Spillway Hydro-Mechanical Equipment
C1	CH0047 - Desing, Supply and Installation of trash Clearing System
C1	CH0048 - Site Clearing Access Road & Ancillary Areas
C1	CH0049 - Supply and Install Log Booms
C1	Engineering Quantity Tracking
C1	CH0031 - Supply and Install Mechanical and Electrical Auxiliaries (MF)
C1	PH0014 - Generator Step-up Transformer
C1	PH0015 - Isolated Phase Bus
C1	PH0016 - Generator Circuit Breakers
C1	PH0035 - Station auxiliary Service Transformers
C1	PH0036 - Accommodation & Construction Site distribution Syst -Aux Transformers
C1	PH0037 - Accommodation & Construction Site 25 kV Switchgear
C1	PH0038 - Accommodation & Construction Site Diesel Generators
C1	SH0019 - Provision of Security Services / Provision of Medical Services
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C1	SH0021 - Provision of Road Maintenance and Snow Clearing Services (MF)
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C1	SH0040 - Provision of Garbage Removal and Disposal Services (MF)
C1	SH0041 - Provision of Ground Transportation Services (HVGB to MF)
C1	SH0051 - Provision of Buildings Maintenance Services (MF)
C1	Kenamu & Paradise Bridges - Access Roads for North Spur & Quarries
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C4	Clearing Estimation Costs - HvdC Lines



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C3	Ph1 - Telecommunication System Design Brief Construction Phase
	Ph1 - Backup Documentation
C3	Ph2 - Telecommunication Devices Early Works Construction Phase - Scope Specification
C3	Ph2 - Telecommunication System Telecommunication Study -
	Early Works Construction Phase - Technical Report
	Ph2 - Technical Report Backup Documentation
C3	Ph3 - Telecommunication System Permanent Phase - Design Brief
	Ph3 - Permanent Phase Backup Documentation
C3	Cable Transition Compound - Design Brief
C3	Single-Line Diagrams
C3	Muskrat Falls to Soldier Pond HVDC Island Link Converter Stations - Design Brief
C3	Shoreline Pond Electrodes - Design Brief
C1	Muskrat Falls Accommodation Complex Functional Design Brief
C1	Short Circuit Calculations - Design Brief
C4	Electrical Design Brief 315 kV & 345 kV Ac Transmission Lines Churchill Falls - Muskrat Falls
C4	315 kV Hvac Geotechnical Baseline Muskrat Falls to Churchill Falls



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C1	Master Equipment List
C1	HVAC Equipment List
C1	Piping Equipment List
C1	Spillway Equipment List
C1	Heavy Mechanical Equipment List



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C1	3 South rockfill Dam
C1	4 Spilway u/s Cofferdam
C1	5 North dam U/S Cofferdam
C1	6 North D/S Cofferdam
C1	7 Powerhouse D/S Cofferdam
C1	8 Spillway D/S Cofferdam
C1	9 Intake U/S Cofferdam
C1	10 Spillway Rock Excavation
C1	11 Spillway Rock Plug
C1	12 Spillway D/S Bridge Ramp
C1	13 Site Prep (Spillway Overburden)
C1	14 Tailrace exc & Rock Plug
C1	15 Intake/PH Rock exc
C1	16 PH zone Structure rock exc
C1	17 Tailrace/PH Rock exc (only)
C1	18 Grand Total CGC
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C1	21 Concrete Aggregate



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C3	1 ABB Supplier Auto Transformers Surge Arresters Instrument Transformer : Capacitor Voltage Transformer & Current Transformer Circuit Breakers
C3	2 ALSTOM Auto Transformers Disconnect Switches Instrument Transformer : Capacitor Voltage Transformer & Current Transformer Circuit Breakers
C3	3 TRENCH Instrument Transformer : Capacitor Voltage Transformer & Current Transformer
C3	4 TOSHIBA Surge Arresters
C3	5 SIMENS Surge Arresters Disconnect Switches
C3	6 SOUTHERN STATES Disconnect Switches
C3	7 MVA Power Inc. Disconnect Switches Circuit Breakers
C3	8 CONDUMEX Inc. Auto Transformers



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Volume 27 : LCP Package Dictionaries List - Register

Component	Type	Code	Revised Package Name
C1	C - Contract	CH0002	Supply and Install Accommodations Complex Buildings
C1	C - Contract	CH0003	Supply and Install Administrative Buildings
C1	C - Contract	CH0004	Construction of Southside Access Road
C1	C - Contract	CH0005	Supply and Install Accommodations Complex Site Utilities
C1	C - Contract	CH0006	Construction of Bulk Excavation Works and Associated Civil Works
C1	C - Contract	CH0007	Construction of Intake and Powerhouse, Spillway and Transition Dams
C1	C - Contract	CH0008	Construction of North Spur Stabilization Works
C1	C - Contract	CH0009	Construction of North and South Dams
C1	C - Contract	CH0023	Construction of Reservoir Clearing South Bank
C1	C - Contract	CH0024	Construction of Reservoir Clearing North Bank
C1	C - Contract	CH0029	Construction of Site Restoration at Muskrat Falls
C1	C - Contract	CH0030	Supply and Install Turbines and Generators
C1	C - Contract	CH0031	Supply and Install Mechanical and Electrical Auxiliaries (MF)
C1	C - Contract	CH0032	Supply and Install Powerhouse Hydro-Mechanical Equipment
C1	C - Contract	CH0033	Supply and Install Powerhouse Cranes
C1	C - Contract	CH0034	Supply and Install Powerhouse Elevator
C1	C - Contract	CH0039	Supply and Install McKenzies River Permanent Bridge
C1	C - Contract	CH0046	Supply and Install Spillway Hydro-Mechanical Equipment
C1	C - Contract	CH0048	Construction of Site Clearing Access Road & Ancillary Areas
C1	C - Contract	CH0049	Supply and Install Log Booms
C1	C - Contract	CH0050	Supply of Concrete including Batch Plant (MF)
C1	C - Contract	CH0052	Construction of Habitat Compensation Works
C1	P - Purchase Order	PH0014	Supply of Generator Step-up Transformer
C1	P - Purchase Order	PH0015	Supply of Isolated Phase Bus
C1	P - Purchase Order	PH0016	Supply of Generator Circuit Breakers
C1	P - Purchase Order	PH0035	Supply of 15kV Switchgear and Station Service Breakers
C1	P - Purchase Order	PH0036	Supply of Auxiliary Transformers
C1	P - Purchase Order	PH0037	Supply of 25kV Switchgear
C1	P - Purchase Order	PH0038	Supply of Emergency Diesel Generators
C1	S - Service Contract	SH0001	Physical Hydraulic Model
C1	S - Service Contract	SH0018	Provision of Catering, Housekeeping and Janitorial Services (MF)
C1	S - Service Contract	SH0019	Provision of Security Services
C1	S - Service Contract	SH0020	Provision of Medical Services
C1	S - Service Contract	SH0021	Provision of Road Maintenance and Snow Clearing Services (MF)
C1	S - Service Contract	SH0022	Provision of Fuel Supply and Dispensing Services (MF)
C1	S - Service Contract	SH0040	Provision of Garbage Removal and Disposal Services (MF)
C1	S - Service Contract	SH0041	Provision of Ground Transportation Services (HVGB to MF)
C1	S - Service Contract	SH0051	Provision of Buildings Maintenance Services (MF)
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C3	C - Contract	CD0502	Construction of AC Substations and Synchronous Condensers Facilities
C3	C - Contract	CD0503	Construction of Earthworks at Various Power Distribution Sites
C3	C - Contract	CD0508	Supply and Install of Electrode Sites
C3	C - Contract	CD0509	Construction Telecommunication Services - Phase 2
C3	C - Contract	CD0510	Supply and Install Permanent Communication Systems
C3	C - Contract	CD0512	Construction of Construction Power Facilities
C3	C - Contract	CD0534	Supply and Install Soldiers Pond Synchronous Condensers
C3	C - Contract	CD0535	Construction Telecommunication Services - Phase 2 Remote Camps
C3	C - Contract	CD0538	Supply and Install Accommodations Camp (CF)
C3	P - Purchase Order	PD0505	Supply of Switchyard Equipment, AC Substations at CF, MF and SP
C3	P - Purchase Order	PD0513	Supply of 138/25 kV Transformers
C3	P - Purchase Order	PD0514	Supply of 138 kV & 25 kV Circuit Breakers
C3	P - Purchase Order	PD0515	Supply of 230 kV, 138 kV & 25 kV Disconnect Switches
C3	P - Purchase Order	PD0518	Supply of 138 kV Capacitor Voltage Transformers
C3	P - Purchase Order	PD0519	Supply of 25 kV Vacuum Interrupters
C3	P - Purchase Order	PD0520	Supply of 25 kV 6 x 3.6 MVAR Capacitor Banks
C3	P - Purchase Order	PD0522	Supply of Pre-fabricated Control Room Building
C3	P - Purchase Order	PD0523	Supply of Substation Service Transformer
C3	P - Purchase Order	PD0529	Supply of 25 kV Reclosers
C3	P - Purchase Order	PD0530	Supply of 138 kV & 25 kV Surge Arrestors
C3	P - Purchase Order	PD0531	Supply of MV Instrument Transformer
C3	P - Purchase Order	PD0533	Supply and Install Early Works Telecom Devices
C3	P - Purchase Order	PD0537	Supply of Power Transformers, AC Substations at CF, MF and SP
C3	P - Purchase Order	PD0561	Supply of D20 RTU and Cabinet (CF) - Construction Power
C3	P - Purchase Order	PD0562	Supply of Specific Relays and Test Switches (CF) - Construction Power
C3	P - Purchase Order	PD0563	Supply of 138 kV Circuit Switcher (CF), MV Switches & Fuse Cut-outs - Construction Power
C3	S - Service Contract	SD0536	Provision of Integrated Commissioning Support Services
C3	S - Service Contract	SD0560	Provision of Early Works Construction Telecommunication Services (MF)
C4	C - Contract	CT0319	Construction of 315 kV HVac Transmission Line (MF to CF)
C4	C - Contract	CT0327	Construction of 350 kV HVdc Transmission Line - Section 1
C4	C - Contract	CT0341	Clearing of Right of Way for 315 kV HVac Transmission Line (MF to CF)
C4	C - Contract	CT0342	Construction of AC Transmission Lines - Island
C4	C - Contract	CT0343	Clearing of Right of Way for HVdc Transmission Line - Section 1
C4	C - Contract	CT0345	Clearing of Right of Way for HVdc Transmission Line - Section 2
C4	C - Contract	CT0346	Construction of 350 kV HVdc Transmission Line - Section 2
C4	P - Purchase Order	PT0300	Supply of Transmission Line Conductors - 315 kV HVac
C4	P - Purchase Order	PT0301	Supply of HVac Insulators - 315 kV HVac
C4	P - Purchase Order	PT0302	Supply of Steel Towers - 315 kV HVac
C4	P - Purchase Order	PT0303	Supply of Tower Hardware - 315 kV HVac
C4	P - Purchase Order	PT0304	Supply of Optical Ground Wire (OPGW) - 315 kV HVac
C4	P - Purchase Order	PT0307	Supply of Steel Tower Foundations - 315 kV HVac
C4	P - Purchase Order	PT0308	Supply of Steel Tower Foundations - 350 kV HVdc
C4	P - Purchase Order	PT0313	Purchase of Electrode Line Wood Poles
C4	P - Purchase Order	PT0326	Supply of Steel Wires - 315 kV HVac
C4	P - Purchase Order	PT0328	Supply of Transmission Line Conductors - 350 kV HVdc
C4	P - Purchase Order	PT0329	Supply of HVdc Insulators - 350 kV HVdc
C4	P - Purchase Order	PT0330	Supply of Steel Towers - 350 kV HVdc
C4	P - Purchase Order	PT0331	Supply of Tower Hardware - 350 kV HVdc
C4	P - Purchase Order	PT0334	Supply of Steel Wires - 350 kV HVdc
C4	P - Purchase Order	PT0335	Supply of Anchor Materials - 315 kV HVac
C4	P - Purchase Order	PT0336	Supply of 25 kV Distribution Line Hardware
C4	P - Purchase Order	PT0337	Supply of 25 kV Distribution Line ADSS Fibre Optic Cable
C4	P - Purchase Order	PT0338	Supply of 25 kV Distribution Line Conductors
C4	P - Purchase Order	PT0339	Supply of 25 kV Distribution Line Insulators
C4	P - Purchase Order	PT0340	Supply of Wood Poles for 138/25 kV Distribution Line
C4	P - Purchase Order	PT0347	Supply of Re-terminations Materials
C4	P - Purchase Order	PT0351	Supply of Wood Poles
C4	P - Purchase Order	PT0352	Supply of Anchor Materials - 350 kV HVdc
C4	P - Purchase Order	PT0353	Supply of Optical Ground Wire (OPGW) - 350 kV HVdc
C4	S - Service Contract	ST0309	Provision of Geotechnical Investigation Services - 315 kV HVac
C4	S - Service Contract	ST0310	Provision of Geotechnical Investigation Services - 350 kV HVdc
C4	S - Service Contract	ST0311	Provision of Survey Services - 315 kV HVac
C4	S - Service Contract	ST0312	Provision of Survey Services - 350 kV HVdc
SM	S - Service Contract	SM0700	Provision of General Freight Forwarding Services
SM	S - Service Contract	SM0701	Provision of Third Party Quality Surveillance & Inspection Services
SM	S - Service Contract	SM0703	Provision of Happy Valley-Goose Bay Project Office Space
SM	S - Service Contract	SM0704	Provision of Surveying Services
SM	S - Service Contract	SM0705	Provision of Laboratory Services
SM	S - Service Contract	SM0706	Supply and Maintenance of Project Vehicles
SM	S - Service Contract	SM0707	Provision of Helicopter Services
SM	S - Service Contract	SM0709	Provision of Air Transportation Services
SM	S - Service Contract	SM0710	Supply and Maintenance of various IT Equipment
SM	S - Service Contract	SM0713	Provision of Geotechnical Investigation Services
SM	S - Service Contract	SM0714	Provision of EPCM Services - SNC Lavalin Inc.
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C1	Comparison DG2 (Nalcor) vs DG3
C1	Summary of DG3 Calculations 27-Feb-12
C1	Summary with Desfor Estimate
C1	Gate Estimate 1-Nov-11
C1	Calculations Gate 3 Estimate
C1	Bridge & Culvert Material Cost
C1	Information Equipment Hourly Rates
C1	Information Hourly Rates - P. Lemay



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Volume 29	C1 - HCSS Cost Reports (26 March 2012)
C1	CH0002 - Accommodations Complex Buildings
C1	CH0003 - Administrative Buildings
C1	CH0004 - South side Access Road
C1	CH0005 - Accommodations Complex Site Utilities
C1	CH0006 - Bulk Excavation Works
C1	CH0007 - Intake and Powerhouse, Spillway and Transition Dams
C1	CH0008 - North Spur Stabilization Works
C1	CH0009 - RCC dams & river Dams
C1	CH0023 - Reservoir Clearing South Bank
C1	CH0024 - Reservoir Clearing North Bank
C1	CH0029 - Construction of site restorationat Muskrat Falls
C1	CH0030 - Desing, Supply and Install Turbines and Generators
C1	CH0031 - Supply and Install Mechanical and Electrical Auxiliaries (MF)
C1	CH0032 - Supply and Install Powerhouse Hydro-Mechanical Equipment
C1	CH0033 - Supply and Install Powerhouse Cranes
C1	CH0034 - Supply and Install Powerhouse Elevator
C1	CH0039 - Supply and Install McKenzies River Permanent Bridge
C1	CH0046 - Supply and Install Spillway Hydro-Mechanical Equipment
C1	CH0048 - Construction of Site Clearing Access Road & Ancillary Areas
C1	CH0049 - Supply and Install Log Booms (Empty)
C1	CH0050 - Supply of Concrete including Batch Plant (MF) (Empty)
C1	CH0052 - Construction of Habitat Compensation Works (Empty)

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Volume 30	C1 - Powerhouse & Spillway : Drawings and Take off Quantities
	C3 - Switchyards & Substations - BOQ : Civil, Concrete, Steel & Building
C1	Spillway Concrete Drawings and MTO
C1	Powerhouse Concrete Drawings and MTO
C1	Spillway & Powerhouse - Rock Excavation BOQ
C1	North Dam - BOQ
C1	South Dam - BOQ
C1	Cofferdams - BOQ
C1	North Spur Improvement - BOQ
C1	Powerhouse & Spillway - Civil Works Specification
C1	Powerhouse : Mechanical Equipments Listing
C1	Powerhouse : Mech Aux HVAC Equipments Listing
C1	Powerhouse - BOQ Superstructure
C1	Powerhouse - BOQ Architectural
C1	Riverside Cofferdam RCC Alternative - Schedule
C3	Electrical Switchyards & Substations - BOQ : Civil, Concrete, Steel & Building



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Volume 31	C3 - DC Specialities (Vol 1 of 2)
	Short-Form Technical Specification & Budget Price Equipments
C3	Comparative Table - Summary
C3	Circuit Breakers
C3	Disconnect Switches
C3	Surge arrestors
C3	Instrument Transformer
C3	Power Transformer
C3	Ground Transformers & Reactors
C3	LV Switchgear & Dist Panels
C3	Battery & Chargers
C3	Post Insulators



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Component	Title / Table of Contents
Volume 32	C3 - DC Specialities (Vol 2 of 2)
	Short-Form Technical Specification & Budget Price Equipments
C3	Diesel Generator
C3	MV Metal-Clad Switchgear
C3	MV XLPE Cables
C3	Protection & Control Panels
C3	LV Control and Power Cables
C3	Electrode Element and Lead Cables
C3	Bus Conductors and Bus Work
C3	Junction Box
C3	Lighting Fixture
C3	Spare Parts
C3	Synchronous Condenser
C3	HVDC Converter
C3	Transition Compound
C3	OH Cranes
C3	Telecommunication
C3	Commissioning
C3	Training



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Component	Title / Table of Contents
<i>Volume 33</i>	Following up Budgetary Prices WORKING DOCUMENT INCOMPLETE
General	General Information
C1	Component C1
C3	Component C3
C4	Component C4



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Component	Title / Table of Contents
<i>Volume 34</i>	Following up Packages

NO TABLE OF CONTENTS
WORKING DOCUMENT



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Component	Title / Table of Contents
Volume 35	C3 : UPDATED ESTIMATES CIVIL AND MECHANICAL WORKS
C3	1 Comparative summary Costs (Civil and Mechanical Works)
C3	2 Churchill Falls AC Switchyard
C3	3 Muskrat Falls AC Switchyard
C3	4 Soldier Pond AC Switchyard
C3	5 Muskrat Falls TAP Switchyard (CANCELLED)
C3	6 Soldier Pond - Syncro Condenser
C3	7 Muskrat Falls DC Converter Station
C3	8 Soldier Pond DC Converter Station
C3	9 Forteau point Transition Compound
C3	10 Shoal Cove Transition Compound
C3	11 Mechanical Equipment and Piping (All Switchyards and Stations)



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Component	Title / Table of Contents
Volume 36	C3 : UPDATED ESTIMATES ELECTRICAL WORKS
C3	1 Comparative summary Costs (Electrical Works)
C3	2 Churchill Falls AC Switchyard
C3	3 Muskrat Falls AC Switchyard
C3	4 Muskrat Falls TAP Switchyard (CANCELLED)
C3	5 Soldier Pond AC Switchyard

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Component	Title / Table of Contents
Volume 37	C3 - Updated Estimates : Detailed Modification in HCSS-PKL5
C3	1 Old Listing by Biditem of Estimate HCSS PKL5
C3	2 Detailed Modifications in Pkgs : CH0006 and CD0501
C3	3 Detailed Modifications in Pkg : CD0502
C3	4 Detailed Modifications in Pkg : CD0503
C3	5 Detailed Modifications in Pkg : CD0508
C3	6 Detailed Modifications in Pkg : CD0534
C3	7 Detailed Modifications in Pkg : CD0538
C3	8 Detailed Modifications in Pkg : PD0505
C3	9 Detailed Modifications in Pkg : PD0537
C3	10 Detailed Modifications in Pkg : SD0536



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Component	Title / Table of Contents
Volume 38	C3 - Updated Estimates : Breakdown Tables
C3	1 Direct Costs : Earthworks and Civil Works
C3	2 Direct Costs : Civil and Mechanical Works
C3	3 Man-hours : Earthworks and Civil Works
C3	4 Man-hours : Civil and Mechanical Works
C3	5 Indirect Costs : Earthworks, Civil and Mechanical Works
C3	6 Direct and Indirect Costs : Electrical Works
C3	7 Direct Costs : Mechanical and Piping Works
C3	8 Electrodes - Direct and Indirect Costs :
C3	9 Background Breakdown Tables
C3	10 Review Luc Chaussé Summary Table and
C3	11 Validation by Réal Mailhot for Commissioning and Pre-commissioning Activities
C3	12 Last informations for Commissioning (May 11, 2012) by Réal Mailhot



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Component	Title / Table of Contents
Volume 39	C3 - Updated Estimates : Summary Tables
C3	1 Comparative Analysis Estimate May 15 vs Estimate HCSS PKL5
C3	2 Borrowed Filling material in Package CD 0503
C3	3 Summary Costs according with PKL5 by Package
C3	4 Summary Costs according with June 1st PKL4 by Package
C3	5 Comparative Table : PKL5 vs PKL4
C3	6 Summary Costs May 15, 2012 (from Estimators)
C3	7 Summary Costs Dec 15, 2011 (from Estimators)
C3	8 Backgroud Summary Costs



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Component	Title / Table of Contents
Volume 40	C4 - HCSS Reports of Direct Costs by Activity - PKL4T
C4	BACKUP CD : C4 Overhead Transmission lines - Excel Files
C4	CT0319 Construction of 315 kV HVac Transmission Line (MF to CF)
C4	CT0327 Construction of 350 kV HVdc Transmission Line - Section 1
C4	CT0341 Clearing of Right of Way for 315 kV HVac Transmission Line (MF to CF)
C4	CT0342 Construction of AC Transmission Lines - Island
C4	CT0343 Clearing of Right of Way for HVdc Transmission Line - Section 1
C4	CT0345 Clearing of Right of Way for HVdc Transmission Line - Section 2
C4	CT0346 Construction of 350 kV HVdc Transmission Line - Section 2
C4	PT0300 Supply of Transmission Line Conductors - 315 kV HVac
C4	PT0301 Supply of HVac Insulators - 315 kV HVac
C4	PT0302 Supply of Steel Towers - 315 kV HVac
C4	PT0303 Supply of Tower Hardware - 315 kV HVac
C4	PT0304 Supply of Optical Ground Wire (OPGW) - 315 kV HVac
C4	PT0307 Supply of Steel Tower Foundations - 315 kV HVac
C4	PT0308 Supply of Steel Tower Foundations - 350 kV HVdc
C4	PT0326 Supply of Steel Wires - 315 kV HVac
C4	PT0328 Supply of Transmission Line Conductors - 350 kV HVdc
C4	PT0329 Supply of HVdc Insulators - 350 kV HVdc
C4	PT0330 Supply of Steel Towers - 350 kV HVdc
C4	PT0331 Supply of Tower Hardware - 350 kV HVdc
C4	PT0334 Supply of Steel Wires - 350 kV HVdc
C4	PT0335 Supply of Anchor Materials - 315 kV HVac
C4	PT0336 Supply of 25 kV Distribution Line Hardware
C4	PT0337 Supply of 25 kV Distribution Line ADSS Fibre Optic Cable
C4	PT0338 Supply of 25 kV Distribution Line Conductors
C4	PT0339 Supply of 25 kV Distribution Line Insulators
C4	PT0340 Supply of Wood Poles for 138/25 kV Distribution Line
C4	PT0351 Supply of Wood Poles
C4	PT0352 Supply of Anchor Materials - 350 kV HVdc
C4	PT0353 Supply of Optical Ground Wire (OPGW) - 350 kV HVdc
C4	ST0309 Provision of Geotechnical Investigation Services - 315 kV HVac
C4	ST0310 Provision of Geotechnical Investigation Services - 315 kV HVdc



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<i>Volume 41</i>	<i>Followed Action Items for Scope of Packages (C1, C3, C4)</i>

Revision : April 23, 2012

Revision : April 25, 2012

Revision : April 16, 2012

Revision : April 3, 2012

Revision : March 22, 2012

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Component	Title / Table of Contents
Volume 42	LCP : Drawings and Equipment Listings
	Drawings :
LCP General	Drawings
C1	Drawings OUT-OF-DATE
C3	Drawings OUT-OF-DATE
C4	Drawings OUT-OF-DATE
	Equipment Listing :
C1	Mater Listing OUT-OF-DATE
C1	HVAC OUT-OF-DATE
C1	Spillway OUT-OF-DATE
C1	Hydromechanicals OUT-OF-DATE
C1	Powerhouse - Equipments OUT-OF-DATE

Attachment B.7

Decision Gate 3 CCE and Financial Model Back-up: Volumes 1 – 4

Binder 1 of 4: LCP Overall (MF + LTA + LITL)

Presents the back-up information to support the DG3 CCE for the overall LCP Phase I, excluding Maritime Link, under the following tabs:

- TAB 1: Process Overview
- TAB 2: DG3 CCE Summary
- TAB 3: Base Estimate Summary
- TAB 4: Escalation Summary – links to DG3 Capital Cost Escalation Report
- TAB 5: Estimate Contingency – links to DG3 Cost and Schedule Risk Analysis Report
- TAB 6: Financial Model produced using project schedule in Primavera that produces incurred cost flows
- TAB 7: Incurred Cost Flows produced from Financial Model
- TAB 8: Cash Flows, including transmittal record to Nalcor Investment Evaluation
- TAB 9: OPEX estimate, including transmittal record to Nalcor Investment Evaluation

Binder 2 of 4: Muskrat Falls Generation (MF)

Presents the back-up information to support the DG3 CCE for Muskrat Falls Generation under the following tabs:

- TAB “MF Estimate”: Summary Table
- TAB “A”: HCSS Output
- TAB “B”: EPCM Services
- TAB “C”: Land and Property
- TAB “D”: Permit File
- TAB “E”: Not Used
- TAB “G”: Owner’s Team File
- TAB “F”: Not Used
- TAB “H”: Historical / Incurred Cost to April 30, 2012
- TAB “I”: Additional Items
- TAB “J”: Corporate Overhead
- TAB “K”: Commercial Negotiations
- TAB “L”: Tax and Audit
- TAB “M”: IT Life of Project
- TAB “N”: Environmental Assessment and Aboriginal Affairs
- TAB “O”: Insurance
- TAB “MF Schedule”: MF Cost Flow Financial Model created in Primavera
- TAB “MF Cost Flows”: MF Cost Flows by Month and by Quarter
- TAB “MF Cash Flows”: MF Cost Flows by Month and by Quarter

Binder 3 of 4: Labrador-Island Transmission Link (LITL)

Presents the back-up information to support the DG3 CCE for Labrador-Island Transmission Link under the following tabs:

- TAB “LITL Estimate”: Summary Table

- TAB "A": HCSS Output
- TAB "B": EPCM Services
- TAB "C": Land and Property
- TAB "D": Permit File
- TAB "E": Not Used
- TAB "G": Owner's Team File
- TAB "F": SOBI Marine Crossing
- TAB "H": Historical / Incurred Cost to April 30, 2012
- TAB "I": Additional Items
- TAB "J": Corporate Overhead
- TAB "K": Commercial Negotiations
- TAB "L": Tax and Audit
- TAB "M": IT Life of Project
- TAB "N": Environmental Assessment and Aboriginal Affairs
- TAB "O": Insurance
- TAB "LITL Schedule": LITL Cost Flow Financial Model created in Primavera
- TAB "LITL Cost Flows": LITL Cost Flows by Month and by Quarter
- TAB "LITL Cash Flows": LITL Cost Flows by Month and by Quarter

Binder 4 of 4: Labrador Transmission Assets (LTA)

Presents the back-up information to support the DG3 CCE for Labrador Transmission Assets under the following tabs:

- TAB "LTA Estimate": Summary Table
- TAB "A": HCSS Output
- TAB "B": EPCM Services
- TAB "C": Land and Property
- TAB "D": Permit File
- TAB "E": Not Used
- TAB "G": Owner's Team File
- TAB "F": Not Used
- TAB "H": Historical / Incurred Cost to April 30, 2012
- TAB "I": Additional Items
- TAB "J": Corporate Overhead
- TAB "K": Commercial Negotiations
- TAB "L": Tax and Audit
- TAB "M": IT Life of Project
- TAB "N": Environmental Assessment and Aboriginal Affairs
- TAB "O": Insurance
- TAB "LTA Schedule": LTA Cost Flow Financial Model created in Primavera
- TAB "LTA Cost Flows": LTA Cost Flows by Month and by Quarter
- TAB "LTA Cash Flows": LTA Cost Flows by Month and by Quarter