

LABRADOR - ISLAND LINK LIMITED PARTNERSHIP

and

H.J. O'CONNELL CONSTRUCTION LIMITED

CIVIL WORKS AGREEMENT

CONSTRUCTION OF EARTHWORKS AT SOLDIER'S POND

Agreement No. CD0503-002

DATED AS OF 18-Oct-2013

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THIS AGREEMENT MADE as of 18-Oct-2013

BETWEEN:

LABRADOR-ISLAND LINK LIMITED PARTNERSHIP, a limited partnership formed pursuant to the laws of the Province of Newfoundland and Labrador, represented by its general partner, Labrador-Island Link General Partner Corporation (hereinafter referred to as "**Company**")

- and -

H.J. O'CONNELL CONSTRUCTION LIMITED, a corporation duly incorporated pursuant to the laws of **the Province of Newfoundland and Labrador** (hereinafter called "**Contractor**").

WHEREAS Company desires the performance of certain Work described in this Agreement;

WHEREAS Contractor is engaged in the business of performing such Work and will provide all expertise, equipment, material and personnel to perform the Work;

WHEREAS Company and Contractor wish to set out the terms and conditions on which Contractor shall carry out the Work;

NOW THEREFORE, the Parties, each in consideration of the promises and agreements of the other, hereby agree as follows:

ARTICLE 1 INTERPRETATION

- 1.1 The intent of this Agreement is to include all equipment, material, labour, products and services necessary for Contractor to perform the Work in accordance with this Agreement and any equipment, material, labour, products and services properly inferable therefrom. Contractor will not supply products or perform work inconsistent with or in contravention of this Agreement.
- 1.2 Capitalized words and phrases used herein shall, for all purposes of this Agreement and the Schedules hereto (unless there is something in the subject matter or context inconsistent therewith or unless otherwise defined herein), have the meaning set out below:
 - (a) "**Acceptance**" means express acceptance, concurrence or consent in writing by Engineer and "**Accepted**", "**Acceptable**" and "**Accept**" shall be construed accordingly.
 - (b) "**Aconex**" means a cloud based computer software program for communication that can be accessed via an internet connection and a web browser.

- (c) **"Affiliate"** or **"Affiliate(s)"** has the meaning given to affiliate in the *Canada Business Corporations Act*, R.S.C. 1985, c. C-44 and includes any limited partnership whose general partner is an affiliate of Company under that statute.
- (d) **"Agent Party"** means initially the Security Trustee, and from time to time any agent or other person designated by the Security Trustee to enforce the Security Interests, or any receiver of the Affiliate Assignee or any person appointed as a receiver by the Security Trustee for the assets of the Affiliate Assignee. At any point in time there shall only be one Agent Party and the Security Trustee shall inform the Contractor each time there is a change in the designation of the Agent Party.
- (e) **"Agreement"** means this document, including the Exhibits as referenced in **Article 1.16**, originally executed or as they may from time to time be supplemented, amended, revised or otherwise modified in accordance with the applicable provisions of this document and the Exhibits.
- (f) **"Applicable Laws"** means all laws, statutes, regulations, standards, codes, orders, by-laws, ordinances, directives or other rules enacted or issued from time to time by any duly constituted Authority having jurisdiction over Contractor or Company or the activities carried out under this Agreement, including safety, occupational health, customs and excise, taxation, workers compensation, labour and environmental protection laws, statutes, regulations, standards, codes, orders, directives and other rules.
- (g) **"Approval"** means express acceptance, concurrence or consent in writing and **"Approve"** and **"Approved"** shall be construed accordingly.
- (h) **"Authority"** means any:
- (i) government or government department or agency;
 - (ii) municipality, local government authority or council;
 - (iii) other statutory authority;
 - (iv) fiscal or judicial body, commission, board, tribunal or agency; or
 - (v) other regulatory person or body;
- (excluding the Company) having jurisdiction or authority in any way over Contractor or Company or the subject matter of the Agreement, including a right to impose a requirement or whose Approval is required with respect to the LCP or the Work.
- (i) **"Billing Information"** has the meaning ascribed thereto in **Article 12.6**.
- (j) **"Bonds"** means any one or both of the Performance Bond and Labour and Material Payment Bond as the context requires.

- (k) **"Breach"** has the meaning ascribed thereto in **Article 34.2**.
- (l) **"Business Day"** means a day that is not a Saturday, Sunday or any other day which is a statutory holiday in the Province of Newfoundland and Labrador.
- (m) **"Change"** means any of the following:
- (i) An addition to the Work;
 - (ii) A deletion of any part of the Work;
 - (iii) A revision or modification to any part of the Work already completed;
 - (iv) A variation to the schedule for the completion of a Milestone;
 - (v) A modification in, variation to or deviation from the requirements set out in Exhibit 1 – Scope of Work;
- but for greater certainty, a Change shall not include:
- (A) modifications, revisions or deviations to the requirements of the Agreement that are necessary to make the Work satisfy the performance requirements set out in Exhibit 1 – Scope of Work;
 - (B) any items that can reasonably be inferred as being included in the Work, including the advancement and development of the design of any element of the Work within the Contactor's responsibility under the Agreement;
 - (C) modifications, revisions or deviations to the requirements of Exhibit 1 – Scope of Work or any additional services that are requested by Company that are necessary because of delays attributable to the Contractor Group;
 - (D) corrections or additional services that are required because of Contractor's breach of any of its representations, covenants, warranties, guarantees or other obligations under this Agreement, including corrections or additional services made necessary due to noncompliance with the Agreement, Applicable laws or the requirements of Authorities;
 - (E) the supply of any services, materials or equipment required to rectify any omissions, defects or deficiencies in the Work; or
 - (F) matters that might otherwise be grounds for alteration of a date for a completion of a Milestone but which coincide with any concurrent delay or other matter within Contractor's responsibility under this Agreement.
- (n) **"Change Order"** means an order or directive for a Change issued in the form set out in Exhibit 3 – Coordination Procedures and signed by Company.

- (o) **"Change Request"** means a request for a Change issued in the form set out in Exhibit 3 – Coordination Procedures.
- (p) **"Claim"** means damages (including punitive and exemplary damages), expenses, costs, losses, injuries, liabilities, claims, liens, judgments, settlements, awards, remedies, debts, expenses, causes of action, demands, court costs, legal fees or disbursements.
- (q) **"Company"** means Labrador-Island Link Limited Partnership and its successors and assigns.
- (r) **"Company Group"** means collectively Company and Company's Other Contractors (including Engineer), and the respective Affiliates and Personnel of each of the foregoing.
- (s) **"Company's Other Contractors"** means all contractors and subcontractors of Company or its Affiliates, including all of their contractors and consultants (including any inspector) except Contractor and Subcontractors.
- (t) **"Company Representative"** means the person designated in accordance with **Article 10.3**.
- (u) **"Company Supplied Data"** means those documents listed in Exhibit 11 – Company Supplied Documents, together with such other documents to be provided by Company as shall be designated by Company in writing from time to time.
- (v) **"Confidential Information"** has the meaning ascribed thereto in **Article 32.1**.
- (w) **"Construction Schedule"** means the schedule for the Contractor's performance of the Work referenced in **Article 8.1** and described in Exhibit 3 – Coordination Procedures.
- (x) **"Contract Price"** means:
 - (i) for all purposes other than those described in paragraphs (ii) and (iii) below, the amounts payable in accordance with this Agreement as the same may be adjusted from time to time by agreement between the Parties or in accordance with the terms of the Agreement, being the consideration for the satisfactory performance of the Work by Contractor in accordance with the Agreement;
 - (ii) for the purposes of the performance security requirements in **Article 7** and project insurance requirements in **Article 20**, the Contract Price shall be the sum specified in Exhibit 2- Compensation, Appendix A – "Schedule of Price Breakdown", in Table 1 as - "Total Estimated Contract Price";
 - (iii) for the purposes of the limitation of liability in **Article 21.15** and limits on

liquidated damages in **Article 26.1**, the Contract Price shall be the greater of the amount referenced in paragraph (i) above or the sum referenced in paragraph (ii) above;

- (iv) and, for greater certainty, Contract Price does not include HST.
- (y) **"Contractor"** means the Person identified as Contractor on the first page of this Agreement, and its successors and permitted assigns.
- (z) **"Contractor Group"** means Contractor and Subcontractors (including Subcontractor's subcontractors of every tier) and their vendors and suppliers and the respective Affiliates and respective Personnel of each of the foregoing.
- (aa) **"Contractor's Items"** means all machinery, systems, fittings, parts, spare parts, apparatus, tools, materials, supplies and any other equipment, material or items which are necessary to be supplied by Contractor Group at their cost to perform the Work but which are not incorporated into and form part of the completed Work.
- (bb) **"Contractor's Personnel"** means the Personnel to be provided by Contractor Group from time to time to perform the Work.
- (cc) **"Contractor's Representative"** is the person nominated as such in accordance with **Article 5.5**.
- (dd) **"Court"** means a court of competent jurisdiction and includes the Supreme Court of Canada.
- (ee) **"Cure Period"** has the meaning ascribed thereto in **Article 34.2**.
- (ff) **"Defect"** means any error, omission, deficiency, defect and/or failure in design, materials, engineering, workmanship, manufacture and/or installation for which Contractor is responsible under this Agreement.
- (gg) **"Dispute"** has the meaning ascribed thereto in **Article 30.1**.
- (hh) **"Drawings"** means the drawings set out in Exhibit 1 - Scope of Work.
- (ii) **"Effective Date"** means 18-Oct-2013.
- (jj) **"Engineer"** means Lower Churchill Management Corporation, or such other Person designated by Company in writing from time to time by giving Notice to Contractor, and any successors or assigns.
- (kk) **"Exhibits"** means the Exhibits forming part of this Agreement and identified in **Article 1.16**.
- (ll) **"Final Completion"** means that point in time when the conditions set out in **Article**

25.6 have been satisfied.

- (mm) **"Final Completion Certificate"** means the certificate issued in accordance with **Article 25.7**.
- (nn) **"Force Majeure"** has the meaning ascribed thereto in **Article 29.1**.
- (oo) **"HST"** means all amounts exigible pursuant to Part IX of the *Excise Tax Act* (Canada), R.S.C. 1985, c. E-15, including, for greater certainty, the taxes commonly referred to as the goods and services tax (GST) and the harmonized sales tax (HST).
- (pp) **"Intellectual Property"** has the meaning ascribed thereto in **Article 36.3**.
- (qq) **"Labour and Material Payment Bond"** means the payment bond described in **Article 7.2**.
- (rr) **"Latent Defect"** means a Defect which could not have been discovered upon reasonable inspection during the Warranty period in **Article 17.1(a)(i)**.
- (ss) **"LCP"** means lower Churchill projects which include hydroelectric power developments on the lower Churchill River located in the Labrador portion of the Province of Newfoundland and Labrador and associated power transmission facilities.
- (tt) **"LEG2/96"** means the 1996 "Model 'Consequences' Defects Wording" published by the London Engineering Group.
- (uu) **"Lender"** means any financial institution providing financing to Company or any of Company's Affiliates for the Work or for the LCP.
- (vv) **"Lower Churchill Construction Projects Benefits Strategy"** means the policy, strategy, obligations and procedures set out in the document located at www.NR.Gov.NL.CA/NR/Energy/LCP_Benefits_Strategy.pdf.
- (ww) **"Milestone"** means the start or completion of an activity in the performance of the Work and which is identified as such in Exhibit 9 – Work and Milestone Schedule.
- (xx) **"Notice"** means a written communication that is required to be delivered in accordance with **Article 39**.
- (yy) **"Party"** means Company or Contractor, as the context requires, and **"Parties"** means Company and Contractor collectively, and reference to any Party includes that Party's executors, administrators, substitutes (including persons taking by novation), successors and permitted assigns.
- (zz) **"Payment Certificate"** means the certificate described in **Article 12.8**.

- (aaa) **"Payment Milestone"** means a Milestone identified in Exhibit 2 – Compensation for which payment of a portion of the Contract Price is to be made by Company to Contractor.
- (bbb) **"Performance Bond"** has the meaning set out in **Article 7.1**.
- (ccc) **"Person"** means an individual, a partnership, a corporation, a trust, an unincorporated organization, a union, a government or any department or agency thereof and the heirs, executors, administrators, successors, assigns or other legal representatives of an individual, and words importing persons have a similar meaning.
- (ddd) **"Personnel"** means the directors, officers, employees, consultants, non-employed representatives and agents of a Person.
- (eee) **"Privacy Law"** means the *Access to Information and Protection of Privacy Act*, S.N.L. 2002 c. A 1.1, and all other applicable federal or provincial laws relating to the privacy, confidentiality or use of any information about individuals.
- (fff) **"Project Manager"** means the person designated to represent Contractor in accordance with **Article 9.4** and **Article 9.5**.
- (ggg) **"Punch List"** means a list of Defects or items of the Work that are not complete.
- (hhh) **"Quality Plan"** means the plan described in Exhibit 7 – Quality Requirements.
- (iii) **"Rights"** has the meaning ascribed thereto in **Article 36.3**.
- (jjj) **"Shop Drawings"** has the meaning ascribed thereto in **Article 37.1**.
- (kkk) **"Site"** means the location for the performance of Work as may be further described in Exhibit 1 – Scope of Work, which may include:
- (i) at the power plant, dam and/or immediate vicinity at Muskrat Falls (Labrador);
 - (ii) at any substations, converter stations, condenser stations and transition compounds at Churchill Falls (Labrador), Forteau Point (Labrador), Soldiers Pond (Newfoundland), Shoal Cove (Newfoundland); and/or
 - (iii) at power transmission line routes, including all roads and access routes to Muskrat Falls (Labrador), *Churchill Falls (Labrador)*, *Forteau Point (Labrador)*, *Soldiers Pond (Newfoundland)*, *Shoal Cove (Newfoundland)* and associated transmission lines.
- (III) **"Standard of a Prudent Contractor"** means good faith performance of contractual obligations and exercising that degree of care, skill, diligence, prudence,

workmanship and foresight expected from a skilled and experienced contractor engaged in the same type of undertaking, in similar circumstances or conditions and in compliance with all Applicable Laws and to the satisfaction of Authorities.

- (mmm) "**Subcontract**" means an agreement (including any written supplement or amendment) entered into between Contractor and any Person in the manner and to the extent permitted under the terms of the Agreement by which Contractor engages such Person to perform any part of the Work.
- (nnn) "**Subcontractor**" means any Person engaged by Contractor, other than employees of Contractor, to perform any part of the Work pursuant to a Subcontract, and shall include the successors and permitted assigns of any such Person.
- (ooo) "**Substantial Completion**" means that the Work has been completed to the extent specified in **Article 25.1**.
- (ppp) "**Substantial Completion Certificate**" means the certificate issued in accordance with **Article 25.2**.
- (qqq) "**Suspension Expenses**" has the meaning ascribed thereto in **Article 28.2**.
- (rrr) "**Suspension Period**" has the meaning ascribed thereto in **Article 28.1**.
- (sss) "**Tax**" or "**Taxes**" means any tax, fee, levy, rental, duty (including, for greater certainty, all customs duties, anti-dumping duties and countervailing duties), charge, royalty or similar charge including, for greater certainty, any federal, state, provincial, municipal, local, aboriginal, foreign or any other assessment, governmental charge, imposition or tariff wherever imposed, assessed or collected, and whether based on or measured by gross receipts, income, profits, sales, use and occupation or otherwise, and including, without limitation, any income tax, capital gains tax, fuel tax, capital tax, goods and services tax, harmonized sales tax, value added tax, sales tax, withholding tax, property tax, business tax, ad valorem tax, transfer tax, franchise tax, payroll tax or excise tax, together with all interest, penalties, fines or additions imposed, assessed or collected with respect to any such amounts.
- (ttt) "**Technical Requirements**" means specifications, drawings, plans or other documentation of a technical or scientific nature, and tests, set out or referenced in the Exhibits.
- (uuu) "**Technical Specifications**" or "**Specifications**" means the documents entitled Engineering Technical Specification and Scope of Work Specification contained in Exhibit 1 – Scope of Work.
- (vvv) "**Term**" has the meaning ascribed thereto in **Article 1.17**.
- (www) "**Warranty**" means the Contractor's obligations set out in **Article 17**.

- (xxx) "**WHSCC**" means the Workplace Health, Safety and Compensation Commission of the Province of Newfoundland and Labrador.
- (yyy) "**Work**" means all labour, supervision, engineering, design services and obligations to be performed and materials, equipment and products to be supplied by Contractor under the terms of this Agreement, as more particularly described in but not limited to **Article 3** and Exhibit 1 – Scope of Work, including Changes and the provision of all Personnel, plant, equipment, tools, supplies, facilities, documentation, records and other items necessary to the performance of such services and obligations.
- (zzz) "**Worksite**" means any lands, waters and any other places on, under, over, in or through which the Work is to be performed, including design offices, workshops, onshore facilities, factories, fabrication facilities and places where Contractor Items are obtained, stored or used for the purposes of this Agreement.
- 1.3 The titles, headings, captions, recitals and the provision of a table of contents are inserted for convenience of reference only and shall not affect the construction or interpretation of this Agreement.
- 1.4 Unless otherwise expressly stated, reference herein to an Exhibit or to an Article, clause, subclause or other subdivision is a reference to such Exhibit to this Agreement or to such Article, clause, subclause or other subdivision within this Agreement. A reference to a Section is a reference to a paragraph, clause, subclause or other subdivision in an Exhibit.
- 1.5 Words importing the singular only shall include the plural and vice versa, words importing any gender shall include other genders and words importing persons shall include individuals, partnerships, associations, trusts, unincorporated organizations and corporations and vice versa. Where a word is defined in this Agreement, a derivative of that word shall have a corresponding meaning.
- 1.6 Any reference in this Agreement to all or any part of any statute, regulation, by-law or other legislative enactment shall, unless otherwise expressly stated, be a reference to that statute, regulation, by-law or legislative enactment or relevant part thereof as amended, substituted, replaced or re-enacted from time to time.
- 1.7 Whenever an amount of money is referred to in this Agreement, such amount shall, unless otherwise expressly stated, be deemed to be Canadian dollars.
- 1.8 Time shall be of the essence with respect to the Milestones in Exhibit 9 – Work and Milestone Schedule.
- 1.9 If the last day of any period of days set out in this Agreement falls on a day which is not a Business Day, such period of days shall be extended to the first Business Day immediately following the last day of such period of days. If anything in this Agreement falls to be done or held on a day which is not a Business Day, the same shall be done or held on the next

succeeding Business Day.

- 1.10 Where reference is made to a direction, response, act, decision, determination, consent, waiver, approval, notice, request or other communication of Company or to matters which must be satisfactory to Company, then, unless otherwise expressly stated, that matter is to be conducted or carried out at the sole discretion of Company.
- 1.11 No waiver of any provision of this Agreement shall be of any force unless such waiver is in writing, is expressly stated to be a waiver of a specified provision of this Agreement and is signed by the Party to be bound thereby. A Party's waiver of any breach of, or failure to enforce, any of the covenants, conditions or other provisions of this Agreement, at any time, shall not in any way affect or limit that Party's right thereafter to enforce or compel strict compliance with every covenant, condition or other provision hereof.
- 1.12 The illegality or unenforceability of any provision of this Agreement shall in no way affect the legality or enforceability of any other provision hereof. Any illegal or unenforceable provision shall be deemed severed from this Agreement and the remainder of this Agreement shall be construed and enforced as if this Agreement did not contain such illegal or unenforceable provision.
- 1.13 Except as otherwise defined in this Agreement, words and abbreviations which have well known technical or trade meanings are used in the Agreement in accordance with such recognized meanings.
- 1.14 If any provision in the Exhibits conflicts with a provision in the Articles of this Agreement, the provision in the Articles of this Agreement shall prevail. In the event that any provision in any of the Exhibits conflict with any other provision in the Exhibits, priority shall be given in the order listed as follows:
- (a) Exhibit 1 - Scope of Work
 - (b) Exhibit 9 – Work and Milestone Schedule
 - (c) Exhibit 2 – Compensation
 - (d) Exhibit 7 - Quality Requirements
 - (e) Exhibit 3 - Coordination Procedures
 - (f) Exhibit 11 - Company Supplied Documents
 - (g) the remaining Exhibits in their numerical order by Exhibit number

except in respect of Technical Requirements, in which case the more stringent provision will prevail.

- 1.15 The rights and recourse of Company and Contractor contained in the Agreement are cumulative and not in the alternative unless otherwise provided. The exercise of any such rights or recourse shall not constitute a waiver or renunciation of any other rights or recourse. Except as expressly provided in the Agreement, the obligations imposed by the Agreement and the rights and remedies available thereunder are in addition to and not a limitation of any obligations, rights and remedies otherwise imposed or available by law.

- 1.16 The following Exhibits are attached hereto and shall form and be read and construed as an integral part of this Agreement:

Exhibit	Description
1	Scope of Work
2	Compensation
3	Coordination Procedures
4	Supplier Document Requirement List
5	Health and Safety Requirements
6	Environment and Regulatory Compliance Requirements
7	Quality Requirements
8	Subcontractors, Manufacturers and Material Sources
9	Work and Milestone Schedule
10	Declaration of Residency
11	Company Supplied Documents
12	Site Conditions
13	Provincial Benefits
14	Performance Security

- 1.17 This Agreement shall be effective from the Effective Date and shall remain in full force and effect until the Work is complete, a Final Completion Certificate has been issued pursuant to **Article 25.7** and all Warranty obligations have been satisfied (the "**Term**"), unless earlier terminated in accordance with the provisions of this Agreement.
- 1.18 The words "includes" and "including", whether or not used with the words "without limitation" or "but not limited to", shall not be construed to be limited by the specific enumeration of items but shall in all cases be without limitation and construed and interpreted to mean "includes without limitation" and "including without limitation".
- 1.19 This Agreement shall be construed and the relations between the Parties determined in accordance with the Applicable Laws of Newfoundland and Labrador and Canada, including any limitation periods, and reference to such Applicable Laws shall not, by application of conflict of laws rules or otherwise, require the application of the Applicable Laws in force in any jurisdiction other than Newfoundland and Labrador. The Parties hereby irrevocably attorn to the Courts of the Province of Newfoundland and Labrador and Canada for the resolution of any dispute arising hereunder.
- 1.20 If the Standard of a Prudent Contractor conflicts with any other provision in this Agreement, the other provision in the Agreement shall prevail. Contractor shall give Notice to Company of any standard or requirement in this Agreement that Contractor considers is less stringent than the Standard of a Prudent Contractor.
- 1.21 The language of this Agreement shall be English and all communications and dealings under and the resolution of any disputes concerning this Agreement shall be conducted in the

English language. All information, data or documentation of any nature that Contractor prepares in the performance of the Work, is required to submit to Company or is requested by Company to submit, shall be prepared in English.

- 1.22 The doctrine of *contra proferentem* shall not apply in the interpretation of this Agreement, meaning that if there is any ambiguous language in this Agreement it shall not be interpreted more strongly against the Party who prepared or drafted the ambiguous language.
- 1.23 Any Approval by Company or Acceptance by Engineer shall not waive Contractor's obligations under Applicable Laws or as outlined in this Agreement.
- 1.24 If Contractor is a joint venture or partnership of two or more Persons, all such Persons shall be jointly and severally liable to Company for all liabilities, indemnities and obligations of Contractor under, and relating to, this Agreement. Such Persons shall designate in writing one of them to act as a partner in charge with authority to bind the joint venture or partnership, as the case may be. The composition or the constitution of the joint venture or partnership, as the case may be, shall not be altered without the prior consent of Company. If requested by Company, Contractor shall provide to Company a copy of the joint venture agreement or partnership agreement, as applicable, excluding its financial terms, and such agreement shall be subject to the provisions of **Article 32**.

ARTICLE 2 GENERAL COVENANTS OF CONTRACTOR

- 2.1 Contractor shall maintain in good standing its corporate existence and shall remain duly qualified to own its assets. Contractor acknowledges that it shall be carrying on business in the Province of Newfoundland and Labrador during the performance of the Work and agrees to comply with the registration and other relevant provisions of the *Corporations Act*, RSNL 1990, c. C-36.
- 2.2 Without limitation, Contractor shall undertake the Work in accordance with Applicable Laws, this Agreement and as required by any Authority. Contractor shall be subject to Company's environmental assessment obligations. For clarification, if any environmental effects or compliance monitoring or other measures are required by any Authority, the costs of such required measures shall be the responsibility of Contractor.
- 2.3 Contractor shall take such action as Company may specify to enable Company to comply with all Applicable Laws and in particular, Applicable Laws governing the use of local personnel, goods and services, which are in effect or which may come into effect during the Term.
- 2.4 Contractor shall promptly pay and discharge all amounts due and payable by Contractor to any and all creditors of Contractor (including all fees payable to obtain or maintain the Approvals and any fines, penalties or judgments resulting from any violation of the terms and conditions of the Approvals or breach of Applicable Laws relating to the LCP) except

that Contractor shall not be required to pay any amounts due and payable to such creditors in respect of any amounts the validity of which is being contested in mediation, arbitration or litigation, provided an amount sufficient to satisfy the amount of the Claim, including interest and penalties, or security satisfactory to the Court has been paid into or delivered to the Court or to a trustee, or alternate provision therefor has been made on terms satisfactory to Company.

- 2.5 Contractor shall maintain the Work free and clear of all security interests other than security interests Approved by Company for financing of Contractor's performance of the Work. If a security interest is filed or registered against the Work that has not been Approved by Company, Contractor shall forthwith pay and discharge such security interest and an amount sufficient to satisfy the amount secured by the security interest, including interest and penalties, or security satisfactory to the Court has been paid into or delivered to the Court or alternate provision therefore has been made on terms satisfactory to Company.
- 2.6 Contractor shall give Notice to Company of any action, suit or proceeding pending or, to the knowledge of Contractor, threatened before any Authority, or before any arbitrator, mediator or referee that materially adversely affects or would reasonably be expected to materially adversely affect the Work.
- 2.7 Contractor shall preserve, protect and defend the Work from and against any action, suit or proceeding that materially adversely affects or, if successful, would reasonably be expected to materially adversely affect the Work. Contractor acknowledges that Company shall have the right, in its sole discretion, to defend its interests in the Work from and against any such action, suit or proceeding and, should Company elect to separately defend, Contractor shall pay all of Company's Costs of such defence and Contractor shall instruct its counsel to make full disclosure to Company.
- 2.8 Contractor represents and warrants that during the Term:
- (a) it has the required skills, experience, facilities, equipment, Personnel and capacity to perform the Work in a timely manner and in accordance with the terms of this Agreement, Applicable Laws, the Standard of a Prudent Contractor and sound industry accepted practices;
 - (b) each of Contractor's Items is of good quality, in good working condition, is in compliance with all Applicable Laws and is fit for its intended use as contemplated in this Agreement; and
 - (c) the making and performance of this Agreement are within its powers, have been duly authorized by all necessary action and do not and will not violate any Applicable Law or any provision of its governing documents.
- 2.9 Contractor covenants that during the Term it:
- (a) shall perform the Work in a diligent, safe, efficient and timely manner and in

accordance with the Standard of a Prudent Contractor;

- (b) shall perform the Work continuously and in accordance with this Agreement, using only Contractor's Personnel and Subcontractors Approved by Company;
 - (c) shall use quality assurance programs in performing the Work which comply with the requirements of Exhibit 7 – Quality Requirements, all Applicable Laws and industry accepted practices;
 - (d) shall schedule all long lead time equipment or products for manufacture at the earliest possible date;
 - (e) shall maintain, at its sole risk, cost and expense, all Contractor's Items throughout the Term;
 - (f) shall comply with, and ensure Contractor's Personnel and Subcontractors comply with, all health and safety requirements set out in Exhibit 5 – Health and Safety Requirements and Applicable Laws;
 - (g) shall comply with, and ensure Contractor's Personnel and Subcontractors comply with, all environment and regulatory requirements set out in Exhibit 6 – Environment and Regulatory Compliance Requirements and Applicable Laws;
 - (h) shall take all steps necessary to maintain good labour relations with Contractor's Personnel to the extent that such requirement is consistent with sound business practice;
 - (i) shall, to enable Company to satisfy itself that Contractor is complying with the terms of this Agreement, provide such reports, records, and other information relating to the performance of the Work as Company may request from time to time, including copies of the qualifications and credentials of Contractor's Personnel and Subcontractors and information relating to quality assurance programs, and permit Company to inspect Contractor's Items and Worksites; and
 - (j) shall implement and maintain a cost effectiveness program ensuring all techniques proposed for the performance of the Work are or have been reviewed to ensure that they are cost effective.
- 2.10 Contractor shall maintain, at its sole risk, cost and expense, all Contractor's Items throughout the Term in the manner necessary to ensure that the representations and warranties in **Article 2.8** shall be true and accurate at all times during the Term. If any of Contractor's Items do not at any time conform to the representations and warranties given in **Article 2.8**, Contractor shall, at Contractor's sole expense, repair such Contractor's Items or replace with items which conform in all respects to such representations and warranties.
- 2.11 Contractor shall be responsible, at its cost, for maintaining such inventories of Contractor's Items as necessary so as to avoid interruptions in the performance of the Work.

- 2.12 Contractor acknowledges and agrees that, except as otherwise expressly provided in this Agreement:
- (a) the success of the construction of the Work is dependent upon the timely performance by Contractor of all of its obligations under this Agreement and upon Company's ability to enforce its rights and remedies under this Agreement;
 - (b) the financial obligations of Company to Contractor in respect of the Work are limited to the payment of the Contract Price in accordance with the terms of this Agreement;
 - (c) Company makes no representations and warranties and gives no undertakings concerning the Tax consequences of or other effects of Applicable Laws on the Work or any corporate structure utilized by Contractor with respect to the Work;
 - (d) Contractor is solely responsible for obtaining its own independent financial, legal, Tax, accounting and technical advice with respect to all aspects of the Work;
 - (e) except as otherwise expressly provided for in this Agreement, Contractor is solely responsible for:
 - (i) the examination and review of all documents and information submitted by Contractor;
 - (ii) the geotechnical and hydrological conditions of the Sites;
 - (iii) obtaining any required Tax rulings; and
 - (iv) all other matters which in any way relate to or affect the Work, the Contract Price or the time for completion of Milestones; and
 - (f) Contractor shall carry out its obligations hereunder independently and without reliance on Company in any manner whatsoever.
- 2.13 Contractor, in performing its obligations under this Agreement, shall establish and maintain appropriate business standards, procedures and controls including those necessary to avoid any real or apparent impropriety or adverse impact on the interests of Company and its Affiliates. Company reserves the right to review such standards and procedures at any time during the Term.
- 2.14 Contractor agrees to perform the Work and to conduct its operations in a manner which is consistent with the highest of ethical standards, including the Code of Business Conduct and Ethics set out in Exhibit 11 – Company Supplied Documents, and to avoid any unlawful or unethical intervention in the political affairs of any country. Contractor agrees to cause all Subcontractors to adopt and enforce the foregoing policy.
- 2.15 Contractor shall not pay any commission or fee, or grant any rebate or make any loan to any

Personnel of Company Group or government official, or favour any Personnel of Company Group or government official with any gift or entertainment of significant value or enter into any business arrangement with any Personnel of Company Group or government official. Contractor agrees to cause all Subcontractors engaged in the performance of the Work to adopt and enforce the foregoing policy.

- 2.16 Whenever in this Agreement reference is made to Company or Engineer providing assistance, services, reviews, Approvals, Acceptances or consents or to Company inspecting the Work or the books or records of Contractor or conducting tests, observations and inspections, such undertaking by Company and Engineer shall not relieve, insulate or exempt Contractor from or represent a waiver of any requirement, liability, covenant or obligation under this Agreement or at law or in equity and shall not create or impose any requirement, liability, covenant, agreement or obligation on Company not otherwise created or imposed pursuant to the express provisions of this Agreement. In no event shall such undertaking by Company be a representation that there has been or will be compliance by Contractor with this Agreement.
- 2.17 All transactions, including those contemplated pursuant to this Agreement, with any Person which is not at arm's length (as that term is defined for purposes of the *Income Tax Act* (Canada) R.S.C. 1985, c.1 (5th Supp.)) from Contractor shall be on terms not less favourable to Contractor than competitive terms available to Contractor in comparable transactions with Persons that are at arm's length from Contractor.
- 2.18 Contractor warrants and acknowledges that it has reviewed and understands the Applicable Laws and Lower Churchill Construction Projects Benefits Strategy governing the use of personnel, goods and services in the Work. Contractor shall, throughout the Term, take such action as Company may specify to enable Company to comply with all Applicable Laws regarding the use of Canadian and Newfoundland and Labrador personnel, goods and services, including any Newfoundland and Labrador Benefits requirements and those requirements set forth in Exhibit 13 - Provincial Benefits of this Agreement. Where Contractor is permitted to subcontract, Contractor shall ensure that Subcontractors comply with such requirements. In addition, Contractor shall provide reports in the manner and format described in Exhibit 13 - Provincial Benefits of this Agreement throughout the Term.

ARTICLE 3 CONTRACTOR'S WORK OBLIGATIONS

- 3.1 Contractor shall carry out all of its obligations under this Agreement and shall perform the Work, including:
- (a) all procurement, fabrication, construction, testing, transport, delivery, maintenance, storage, documentation, preservation, installation, testing, commissioning, repair and remediation of the Work;
 - (b) provision of all supervision, services, labour, trades, drafting, accounting, purchasing, expediting, inspection, testing, Personnel, Contractor's Items,

transportation, mobilization and demobilization required for the compliance with and fulfillment of all Contractor's obligations under this Agreement;

- (c) provision and installation of all equipment, products and materials required by this Agreement at a Site;
- (d) ensuring the Work conforms strictly as to quality and description with the particulars stated in Exhibit 1 – Scope of Work and Company Supplied Data and complies with all Applicable Laws;
- (e) any design or engineering which is the responsibility of Contractor under this Agreement (which is limited to the design of the Soldier's Pond access roads, an optional bridge at Soldier's Pond and any temporary structures for construction purposes);
- (f) satisfaction of the performance requirements set out in Exhibit 1 – Scope of Work;
- (g) provision of all documents as required under, and in accordance with, the terms of this Agreement;
- (h) provision of any work not expressly detailed in this Agreement but which is necessary for the performance of the Work in accordance with this Agreement;
- (i) rectification of any and all Defects in the Work as noted by Company, Engineer or any Authority; and
- (j) completing the Work, and portions thereof, in accordance with Exhibit 9 – Work and Milestone Schedule.

3.2 Contractor shall review and verify the details contained in Exhibit 1 - Scope of Work and Exhibit 11 - Company Supplied Documents, and represents that it has a full knowledge and understanding of the nature and the scope of the Work, and including weather and all other conditions at Worksites. Contractor shall :

- (a) advise Engineer of any errors, omissions and inconsistencies in this Agreement and shall not proceed with any part of the Work affected by such until resolved by Engineer; and
- (b) promptly report to Engineer any error, inconsistency or omission or any non-compliance with Applicable Laws which Contractor may discover and not proceed with the affected work until Engineer has received corrected or missing information from Contractor.

3.3 Contractor shall ensure the work it performs is sufficient to encompass all matters necessary for the proper and efficient fulfillment of Contractor's obligations under this Agreement.

- 3.4 Products and materials provided by Contractor shall be new. Products or materials which are not specified shall be of a quality consistent with those specified, fit for their intended use and Acceptable to Engineer.
- 3.5 All equipment, material, products, services, labour and other items required for completion of the Work are to be provided by Contractor and included in this Agreement, regardless of whether they are included in or differ from the quantities of equipment, material, labour and other items shown or described in Exhibit 1 – Scope of Work.
- 3.6 Contractor shall perform the Work to the Standard of a Prudent Contractor and shall ensure that Contractor Group shall perform to the same standard. Any material failure or any refusal or inability of Contractor to comply with the foregoing requirements shall constitute a breach of this Agreement. Contractor shall be solely responsible for any operations comprising the Work performed by Contractor Group.
- 3.7 Subject to **Article 10.3**, Contractor shall obtain and maintain all directions, guidelines, permits, certificates, authorizations, dispensations and licences of any type whatsoever necessary for the performance of the Work and shall comply with all Applicable Laws and requirements of Authorities. Contractor shall assist Company and provide necessary information and documents to support Company fulfilling Company's obligations set out in **Article 10.3**. Contractor shall promptly notify Company in writing upon any discovery of a failure to adhere to the foregoing requirements in connection with the performance of the Work and shall defend, indemnify and hold Company Group harmless from and against all fines and penalties, as well as costs, expenses, rates and charges of Contractor Group and third parties, resulting from the failure of Contractor Group to comply with the foregoing requirements.
- 3.8 Contractor shall comply with all lawful instructions of Company pertaining to the performance of the Work, as communicated through the Company Representative, Engineer or otherwise in accordance with this Agreement. The absence of instructions from Company shall not permit Contractor to avoid its duty to perform its obligations under this Agreement. If Contractor fails to comply with a lawful instruction, then Company may at Contractor's sole risk and cost take whatever measures Company considers necessary to implement the instruction.
- 3.9 When work is performed by Company's Other Contractors at a Site at which Contractor is performing Work, Contractor shall:
- (a) afford Company and Company's Other Contractors reasonable opportunity to introduce and store their products and use their construction machinery and equipment to execute their work;
 - (b) co-ordinate and schedule the Work with the work of Company's Other Contractors;
 - (c) participate with Company's Other Contractors and Engineer in reviewing their construction schedules when directed to do so;

- (d) where part of the Work is affected by or depends upon for its proper execution the work of Company's Other Contractors, promptly report to Engineer in writing and prior to proceeding with that part of the Work, any apparent deficiencies in such work (failure by Contractor to so report will constitute a waiver of claims against Company by reason of the deficiencies in the work of Company's Other Contractors except for those deficiencies not then reasonably discoverable); and
 - (e) comply with the requirements of **Article 31**.
- 3.10 At Company's option, Contractor shall transfer all unused excess materials, if any, to Company at the completion of the Work or sell such excess materials and any amounts realized from such sales shall be credited to Company as a deduction from the Contract Price.
- 3.11 Contractor shall direct and supervise the Work effectively to ensure conformity with the Agreement. Contractor will have sole responsibility for construction and installation means, methods, techniques, sequences and procedures and for coordinating the various parts of the Work under this Agreement.
- 3.12 Contractor will have the sole responsibility for the design, erection, operation, maintenance and removal of temporary supports, structures and facilities and the design and execution of construction methods required in their use.
- 3.13 Contractor will engage and pay for registered professional engineering personnel skilled in the appropriate disciplines to perform those functions referred to in **Articles 3.1(e)** and **3.12** where required by Applicable Laws or by the Agreement and in all cases where such temporary supports, structures and facilities and their method of construction are of such a nature that professional engineering skill is required to produce safe and satisfactory results.
- 3.14 Contractor Group will confine construction machinery and equipment, storage of products and operations of Contractor Group Personnel to limits indicated by Applicable Laws, permits or the Agreement and will not unreasonably encumber the Work with products, materials, or equipment.
- 3.15 Contractor will not load or permit to be loaded any part of the Work with a weight or force that will endanger the safety of Persons or the Work. Contractor shall be responsible for all aspects of lifting activities for the performance of the Work unless otherwise stated in Exhibit 1 – Scope of Work.
- 3.16 Where the Work and work of Company's Other Contractors is to be joined, connected, incorporated or merged, Contractor will do the cutting and remedial work required to make the several parts of the Work and the work performed by Company's Other Contractors come together properly. Contractor is responsible for:
 - (a) the integration of the Work with existing work or on-going work being carried out by

Company's Other Contractors;

- (b) coordinating the Work to ensure that this requirement is kept to a minimum;
 - (c) performing any cutting and remedial work in a manner to neither damage nor endanger the Work.
- 3.17 Contractor will maintain the Work in a tidy condition and free from accumulation of waste products and debris, other than that caused by Company, Company's Other Contractors or their Personnel.
- 3.18 Contractor will remove waste products and debris, other than that resulting from the work of Company, Company's Other Contractors or their Personnel, and will leave the Work clean and suitable for use by Company before attainment of Substantial Completion. Contractor will remove products, tools, construction machinery and equipment not required for the performance of the remaining Work.
- 3.19 Prior to application for a Final Completion Certificate for payment, Contractor will remove all products, tools, construction machinery and equipment and waste products and debris, other than that resulting from the work of Company, Company's Other Contractors or their Personnel.
- 3.20 Contractor shall provide and pay for labour, products, tools, construction machinery and equipment, water, heat, light, power, transportation and other facilities and services necessary for the performance of the Work unless expressly stated in Exhibit 1 – Scope of Work that one or more of such items is to be provided by Company.
- 3.21 Subject to a Change to the Milestone Schedule made pursuant to **Article 14**, Contractor agrees to:
- (a) commence on or before the start date for each Milestone in Exhibit 9 – Work and Milestone Schedule;
 - (b) complete the Work for each Milestone by the date specified for each Milestone in Exhibit 9 - Work and Milestone Schedule;
 - (c) complete the Work on or before the date for Final Completion for the Work set out in Exhibit 9 – Work and Milestone Schedule; and
 - (d) take all measures and act diligently in order that Contractor Group may timely comply with the duties and obligations imposed on Contractor under this Agreement.
- 3.22 Except as expressly provided in this Agreement, Contractor shall bear all costs, risk and liability in relation to the planning, procuring, construction, commissioning and completion of the Work including risk in delay, cost overruns and third party claims.

- 3.23 Contractor shall cause to be documented any archaeological finds located in or under the Worksites. Any artefacts exposed and/or recovered as a result of the excavation of a Site shall, as between Contractor and Company, become the property of Company.

ARTICLE 4
REPORTING AND MEETINGS

- 4.1 Contractor shall attend and participate in the meetings described in Exhibit 3 – Coordination Procedures and shall ensure, unless otherwise required by Engineer, that all relevant Subcontractors shall also attend when the subject matter of the meeting involves, relates to or impacts Subcontract work of that Subcontractor.
- 4.2 Contractor shall prepare and deliver to Engineer the progress and other reports set out in Exhibit 3 – Coordination Procedures.
- 4.3 Contractor agrees that Contractor's submission of a progress or other report is for Company's information only, and Company's receipt of such reports shall not bind Company in any manner. Company's receipt of a progress or other report shall not imply that Company:
- (a) approves Contractor 's Construction Schedule;
 - (b) agrees that Contractor has the capacity or ability to complete the Work in accordance with the Construction Schedule;
 - (c) agrees that the Work can or will be completed in accordance with Exhibit 9 – Work and Milestone Schedule;
 - (d) consents to any changes in scheduling or agrees to any extension of time;
 - (e) has been given Notice of any thing for which Notice is required under this Agreement; or
 - (f) waives any of the terms or conditions of this Agreement.
- 4.4 Contractor shall also attend any meeting which may be required by Company, acting reasonably, from time to time in connection with the Work, provided that Contractor has had at least twenty-four (24) hours notice of such meeting. Company and Engineer shall have the right of direct access to Contractor Personnel responsible for the functions of planning, constructing, commissioning, and environmental management.
- 4.5 Contractor shall inform Engineer in a timely manner of:
- (a) all emergencies;
 - (b) the status of the Approval processes;

- (c) the occurrence of all uncontrollable material events; and
- (d) any other significant information as would be expected under customary and prudent business practices given the nature of the Work.

ARTICLE 5
CONTRACTOR'S PERSONNEL

- 5.1 Contractor shall furnish and procure the numbers and classifications of Contractor's Personnel required to perform the Work. In the event Contractor fails to provide the numbers or classifications of Contractor's Personnel required in respect of the Work, and upon reasonable Notice to Contractor, Company may, at Contractor's sole expense, retain other contractors and deduct the costs associated with retaining such other contractors from the applicable compensation payable by Company to Contractor for the period such positions remain unfilled by Contractor. In such circumstances, Contractor shall assume, indemnify and save Company harmless for all liabilities associated with the retention of such other contractors.
- 5.2 Contractor shall ensure that throughout the Term each of Contractor's Personnel has the qualifications, training and experience, and holds valid licenses and certifications necessary to carry out assigned duties in the performance of the Work (including visas and work permits). Contractor shall furnish records of competence for all of Contractor's Personnel when requested to do so by Company.
- 5.3 Contractor shall immediately remove and/or replace, at Contractor's own expense, any of Contractor's Personnel if, in the sole judgment of Company, any of Contractor's Personnel:
- (a) ceases to carry out his or her duties in a manner satisfactory to Company or engages in misconduct, unsafe activities, or is incompetent or negligent;
 - (b) is certified by a medical practitioner as being medically unfit for the duties required of him or her; or
 - (c) risks impairing his or her usefulness in the performance of his or her duties through the use of alcohol or drugs.
- 5.4 Unless otherwise Approved by Company, Contractor shall replace, or cause to be replaced, at Contractor's own expense, any of Contractor's Personnel who is transferred or dismissed by Contractor or any Subcontractor, or leaves Contractor's or Subcontractor's employ.
- 5.5 Contractor shall nominate in writing one of Contractor's Personnel as Contractor's Representative. Contractor's Representative shall:
- (a) be in charge of Contractor's Personnel and shall supervise Contractor's Personnel and maintain strict discipline in order to ensure the timely and efficient performance of the Work;

- (b) shall notify Company in writing of the occurrence of or threat of any labour dispute involving Contractor's Personnel;
 - (c) have full authority to act on behalf of and bind Contractor on all labour and Contractor's Personnel issues which arise between Company and Contractor;
 - (d) supervise the performance of the Work;
 - (e) have the authority to commit Contractor to any course of action consistent with Contractor's rights and obligations under this Agreement; and
 - (f) be authorized to receive on behalf of Contractor any Notices, information or decisions of Company made pursuant to this Agreement.
- 5.6 If positions of Contractor's Personnel of key importance to the performance of the Work are listed in Exhibit 3 – Coordination Procedures, Contractor shall not change any Personnel in such positions without the prior Approval of Company. In the event any such key Personnel leave the service of Contractor, Contractor shall promptly use all commercially reasonable efforts to retain suitably trained and experienced replacement key Personnel. Contractor shall not retain such replacement key Personnel on a permanent basis without first obtaining Company's Approval, which shall not be unreasonably withheld or delayed.
- 5.7 Contractor shall be responsible for, and shall defend, protect, release, indemnify and hold Company Group harmless from and against all Claims of any nature incurred by Company Group in connection with the payment of Contractor's Personnel, including all compensation, medical costs, Taxes (including all Canadian and foreign payroll and withholding Taxes and remittances), unemployment insurance premiums, Canada pension plan contributions and other benefits of whatever nature or as may be applicable in any jurisdiction (including any jurisdiction where the Work is performed or where the Personnel reside or are employed).
- 5.8 Contractor shall be responsible for, and shall defend, protect, release, indemnify and hold Company Group harmless from and against all Claims of any nature incurred by Company Group, including Claims by third parties and Company's Other Contractors, and against any damage to Company Group property arising from any act or omission by Contractor's Personnel.

ARTICLE 6 SUBCONTRACTS

- 6.1 Subject to **Articles 6.2** and **6.3**, Contractor may enter into Subcontracts for the performance of its obligations as set out in this Agreement provided, however, that Contractor shall not be relieved of any of its obligations to Company as set forth in this Agreement.
- 6.2 Contractor shall not Subcontract the whole of the Work and shall not Subcontract the performance of any portion of the Work, or its obligations under this Agreement, without Company's prior Approval.

- 6.3 For all Subcontractors that are identified in Exhibit 8 – Subcontractors, Manufacturers and Material Sources, Contractor shall not be entitled to replace or add one or more Subcontractors without the prior Approval of Company, which Approval shall not be unreasonably withheld.
- 6.4 Contractor agrees that:
- (a) each Subcontract shall be in writing, in form and substance satisfactory to Engineer;
 - (b) upon written request by Engineer, Contractor shall deliver to Engineer a copy of the executed Subcontract (which may omit pricing details only);
 - (c) no Subcontract shall be amended, varied or terminated without the prior Acceptance of Engineer provided, however, Engineer's Acceptance is not required for amendments or variations which impact on the Work but which do not cause the Work to vary from the Technical Requirements;
 - (d) for any Subcontract delivered to Engineer, Contractor shall deliver to Engineer a copy of all amendments or variations to the Subcontract forthwith upon execution thereof; and
 - (e) Contractor shall obtain or cause to be obtained from each Subcontractor a consent by such Subcontractor permitting the assignment to Company of the Subcontract.
- 6.5 Contractor will preserve and protect the rights of the Company under this Agreement with respect to work to be performed under Subcontract and will:
- (a) incorporate the terms and conditions of the Agreement into all contracts or written agreements with Subcontractors; and
 - (b) be as fully responsible to Company for acts and omissions of Subcontractors and of persons directly or indirectly employed by them as for acts and omissions of persons directly employed by Contractor.
- 6.6 Company may, in Company's sole discretion and acting reasonably, at any time object to the use of a Subcontractor and require Contractor to employ another Subcontractor.
- 6.7 Company may provide to a Subcontractor information as to the percentage of such Subcontractor's work which has been certified for payment.
- 6.8 Contractor shall be responsible for all acts, defaults, and neglects whether occurring in relation to workmanship under contract, tort or statute of any Subcontractor, agent, servant, supplier, manufacturer and/or workman employed, retained or used by Contractor as fully as if they were acts, defaults or neglects of Contractor directly.
- 6.9 Contractor will maintain good order and discipline among Contractor Group and their respective Personnel or agents engaged on the Work and will not employ on the Work

anyone not skilled in the tasks assigned.

- 6.10 Nothing contained in this Agreement will create any contractual relationship between or among:
- (a) Company and any Subcontractor, and any agent, employee and consultant thereof, or any other Person performing any of the Work;
 - (b) Company and any design or engineering consultant retained or hired by Contractor Group or their agent, employee or other person performing any of the Work.
- 6.11 Contractor shall immediately upon receipt of notice of any claim by any member of Contractor Group for a lien under the *Mechanics' Lien Act*, R.S.N.L. 1990, c.M-3, or otherwise, affecting or purporting to affect the Work, the LCP or the Site:
- (a) give Notice to Company; and
 - (b) take or cause to be taken on behalf of Company such measures as shall be necessary to procure the discharge thereof, including legal proceedings, if required.

However, in the event of a bona fide dispute with the lien claimant as to the validity of any claim for such lien, Contractor, subject to the Approval of Company, shall defend on behalf of Company, after first taking such steps on behalf of Company as may be necessary to remove all registrations in connection with such lien from title to the Work, the LCP and the Worksites, and shall indemnify Company pursuant to the provisions of **Article 21**. To the extent necessary to implement the foregoing, Company hereby authorizes Contractor to make such applications and to commence or participate in any legal or other proceedings in the name of Company as may be considered by Contractor to be necessary to perform the aforesaid obligations.

ARTICLE 7 PERFORMANCE SECURITY

- 7.1 Company requires Contractor to deliver to Company on or before the Effective Date a performance bond to guarantee to Company performance of the Work ("**Performance Bond**"). Contractor represents and warrants to and in favour of Company that the Performance Bond shall:
- (a) be in effect as of the Effective Date;
 - (b) bond all of Contractor's obligations under this Agreement;
 - (c) strictly conform to the form of performance bond in Exhibit 14 – Performance Security;
 - (d) be in the face amount of fifty percent (50%) of the Contract Price, prepaid and non-cancellable by the surety;

- (e) be issued by a surety which has a minimum credit rating of A- by Standard & Poor's, or equivalent rating by another rating agency Approved by Company; and
- (f) include a guarantee for correction of faulty workmanship and construction deficiencies for a period of three (3) years from the date of Final Completion shown on the Final Completion Certificate.

7.2 Company requires Contractor to deliver to Company on or before the Effective Date a labour and materials payment bond which shall guarantee to Company prompt payment by Contractor to Subcontractors, vendors and suppliers all amounts properly payable by Contractor ("**Labour and Material Payment Bond**"). Contractor represents and warrants to and in favour of Company that the Labour and Material Payment Bond shall:

- (a) be in effect as of the Effective Date;
- (b) strictly conform to the form of labour and materials payment bond in Exhibit 14 – Performance Security;
- (c) be in the face amount of fifty percent (50%) of the Contract Price, prepaid and non-cancellable by the surety;
- (d) be issued by a surety which has a minimum credit rating of A- by Standard & Poor's, or equivalent rating by another rating agency Approved by Company;
- (e) contain language permitting the Labour and Material Payment Bond to be "broad form" so as to provide protection to other than "first tier" Subcontractors; and
- (f) remain in full force and effect until one year following the date of Final Completion shown on the Final Completion Certificate.

7.3 For each Bond delivered by Contractor to Company in accordance with **Articles 7.1** or **7.2**:

- (a) Contractor shall submit such evidence to Company as it may reasonably require from time to time that the Bond is in good standing and that the surety is satisfactory to Company;
- (b) in the event the surety ceases to be satisfactory to Company, Contractor shall deliver to Company a replacement Bond which meets all the terms and conditions set forth in **Articles 7.1** or **7.2**, as the case may be, *mutatis mutandis*;
- (c) the Bond shall not be amended, varied, renewed, supplemented or replaced except with an amendment, variation, renewal, supplement or replacement which meets all the terms and conditions set forth in **Articles 7.1** or **7.2**, as the case may be, *mutatis mutandis*;
- (d) Contractor shall notify and shall cause the surety to notify Company of any default or alleged default under the Bond, such notice to be delivered not later than five (5)

Business Days after Contractor and the surety, respectively, first become aware of the default or alleged default; and

- (e) Contractor shall cooperate with the surety and Company and shall cause any other member of Contractor Group having an interest in the Bond to cooperate in the negotiation and settlement of any Claims under the Bond.
- 7.4 All costs and expenses incurred in relation to the establishment and maintenance of the Performance Bond, and Labour and Material Payment Bond described in this **Article 7** shall be included in the Contract Price.
- 7.5 Company may claim and have recourse to the Performance Bond and Labour and Material Payment Bond, or in any combination, if Contractor has not performed its obligations in accordance with the Agreement or if Company otherwise has a Claim against Contractor.

ARTICLE 8 CONSTRUCTION SCHEDULE

- 8.1 Contractor shall prepare and maintain the schedules for the performance of the Work set out in Exhibit 3 – Coordination Procedures ("**Construction Schedule**").
- 8.2 Contractor represents and warrants to and in favour of Company that the Construction Schedule:
- (a) includes all elements of the Work;
 - (b) is consistent with this Agreement;
 - (c) provides that each Milestone shall be achieved on or before the applicable date in Exhibit 9 – Work and Milestone Schedule;
 - (d) includes critical start and finish dates, critical milestones and commissioning periods for each element of the Work; and
 - (e) includes an appropriate allocation of time for completion of each item of Work.
- 8.3 The Construction Schedule shall be updated as necessary and in any event shall be updated by Contractor at least monthly and delivered to Engineer not more than seven (7) days after the end of the preceding month. Updates to the Construction Schedule shall comply with the requirements of this **Article 8** and the other terms of this Agreement.
- 8.4 Contractor shall use computer-based critical path methodology in maintaining and updating the Construction Schedule which shall estimate and schedule the time required to complete each element of the Work. The Construction Schedule shall, at all times, show all significant construction and related activities in support of all start dates and Milestone completion dates established under this Agreement, sufficiently detailed so that each of the following will be included and will be readily apparent:

- (a) the construction activities necessary to complete the Work;
- (b) the dates for delivery of all material, machinery, equipment and fixtures forming part of the Work;
- (c) Subcontractor interfaces and requirements; and
- (d) Milestone completion dates, which shall include allowances for normal delays and difficulties that may be encountered in work of this nature, including weather and holidays.

**ARTICLE 9
CONSTRUCTION SUPERVISION**

- 9.1 Contractor will be solely responsible for construction safety at the Worksites and for compliance with the rules, regulations and practices required by the applicable construction health and safety legislation and will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Work.
- 9.2 Unless otherwise agreed in writing by Company, Contractor shall carry out or arrange for security for the Worksites and establish sufficient lighting and sign posting sufficient to ensure protection against damage or injury to persons or to the Work.
- 9.3 Contractor shall be responsible for all costs related to safety measures necessary for the prevention of accidents, the occupation of land, traffic, access to adjacent properties and the observation of all health and safety requirements under the Applicable Law.
- 9.4 Contractor will employ a competent Project Manager, site supervisor and necessary assistants. The site supervisor and necessary assistants will be in attendance at the Worksites while Work is being performed. The Project Manager or site supervisor will not be changed except for valid reason and only then with the prior Approval of Company. Company will be entitled by Notice to Contractor to object to any representative or person employed by Contractor (including persons other than Contractor's supervisor) in the execution of the Work who, in the opinion of Company, misconducts himself or herself is incompetent or negligent, and Contractor shall remove such person from the Work.
- 9.5 The Project Manager will represent Contractor generally and the site supervisor will represent Contractor at the Site. Instructions and notices given by Company to the Project Manager or to the site supervisor at the Site will be deemed received by Contractor.
- 9.6 For the purposes of the Applicable Laws, Contractor will be deemed to have control and management of the Worksites.

ARTICLE 10
COMPANY'S OBLIGATIONS AND RIGHTS

- 10.1 Subject to the provisions of this Agreement, Company agrees to engage Contractor to perform the Work in accordance with the terms of this Agreement.
- 10.2 Company, through the Company Representative or Engineer, shall provide to Contractor such instructions and information which can only be provided by Company. The provision of any such instructions or information shall not in any way relieve Contractor of any of its obligations under this Agreement.
- 10.3 Company shall obtain all authorizations, permits and licenses required by Applicable Laws for the performance of the Work and which are required to be and can only be obtained in Company's name.
- 10.4 Company shall designate a Company Representative who shall have authority to act on behalf of Company regarding matters under the Agreement, receive Notices and perform such other duties and acts reserved to the Company Representative under this Agreement.
- 10.5 The Company Representative shall at all times during the Term have access to the Contractor's Items and Worksites and may without limitation monitor the performance of the Work.
- 10.6 The Company Representative, by Notice to Contractor, may delegate any of his or her authority to any nominated deputy. Such Notice shall specify the precise authority of such deputy.
- 10.7 Company may change the Company Representative at any time at its sole discretion by Notice to Contractor.
- 10.8 Company is not obligated to supply any equipment, products or materials unless expressly stated in the Exhibits that Company will supply specific equipment, products or materials. If any such equipment, products or materials are supplied by Company to Contractor, the equipment, products and materials shall be in the care and custody of Contractor but shall remain the property of Company. Contractor shall not use any such equipment, products and materials supplied by Company except for the purpose for which they were intended under this Agreement, and Contractor shall be responsible for the proper care, handling and maintenance of all such equipment and materials and shall indemnify Company against any loss or damage.
- 10.9 Company has the right to award contracts in connection with the LCP to Company's Other Contractors.

ARTICLE 11
ROLE AND RESPONSIBILITIES OF ENGINEER

- 11.1 Engineer shall have such powers, discretions, functions and authorities as are specified in or

as may be implied from this Agreement and shall carry out such duties (including issuing instructions, decisions, orders and Acceptance).

- 11.2 Wherever Engineer delegates its role, responsibilities and authority as Engineer to an individual, and wherever such individual in his/her capacity as Engineer is required to exercise his or her discretion by the giving of a decision, opinion or Acceptance, or to determine the cost or value of any matter which may affect the rights or obligations of a Party, he or she shall exercise such discretion impartially within the terms of this Agreement, having regard to all circumstances.
- 11.3 Contractor shall comply with the decisions, orders and instructions given by Engineer in accordance with this Agreement.
- 11.4 Engineer shall confirm any decision, order or instruction in writing and any decision, order or instruction shall not be effective until such written confirmation has been received by Contractor.
- 11.5 Engineer shall be the interpreter of first instance of the Technical Requirements.
- 11.6 Contractor agrees that all Contractor's Items may be subject to inspection and Acceptance from time to time by Engineer or any Authority. Any Contractor Item which is rejected for not performing to standards set out in this Agreement or by Applicable Laws shall be immediately removed from the Worksite by Contractor and replaced with Contractor's Items Acceptable to Engineer at Contractor's cost.
- 11.7 Contractor shall not commence any Work involving permanent installation of any equipment, materials or products until the Contractor has submitted to Engineer and Engineer has Accepted the health, safety and environmental plans required by **Article 15** and Engineer has issued drawings marked "issued for construction" for the part of the Work to be performed.
- 11.8 Engineer shall notify Contractor when the Site is available for permanent installation of any equipment, materials or products as part of the Work, and Contractor shall not commence any Work at the Site until such notification has been given.
- 11.9 Where the Agreement calls for the Acceptance by Engineer or Approval by Company with respect to design, manufacture, installation, testing and commissioning of the Work, any such Acceptance or Approval is for general compliance with the Technical Requirements and does not relieve Contractor from satisfying all Technical Requirements. No inspection, review or Acceptance by Engineer or Approval by Company shall release Contractor from compliance with Contractor's obligations under this Agreement or Applicable Law.

ARTICLE 12 COMPENSATION AND TERMS OF PAYMENT

- 12.1 As full compensation for the performance by Contractor of all its obligations under this Agreement, Company shall pay Contractor the Contract Price in accordance with the terms

of this Agreement including **Article 12**, Exhibit 2 – Compensation and Exhibit 3 – Coordination Procedures. Only those rates and prices specifically identified in Exhibit 2 – Compensation shall be paid by Company and any costs not specifically identified in Exhibit 2 - Compensation shall be deemed to be included in such rates and prices. Company shall have no obligation to pay Contractor for the purchase of any goods or performance of any services which have not been Approved by Company prior to delivery of such goods or prior to performance of such services.

12.2 Within thirty (30) days of the Effective Date, Engineer, on behalf of Company, shall provide Contractor with a pro forma invoice that sets out all relevant Company cost codes and required information. Contractor shall utilize said pro forma invoice and cost codes when billing Company.

12.3 Compensation to Contractor shall be paid:

- (a) monthly based on progress, and/or
- (b) upon achieving a Payment Milestone,

as further specified in Exhibit 2 – Compensation. Contractor shall be paid the portion of the Contract Price applicable to monthly progress or to a Payment Milestone following Approval by Company of a Payment Certificate and in accordance with the provisions of this **Article 12**.

12.4 Contractor shall provide, maintain and issue to Engineer, a detailed listing of the invoiced amounts of the Work and cash flow requirements regarding unbilled portions of the Work in accordance with the requirements set out in Exhibit 3 – Coordination Procedures. Contractor shall develop and present a format for the listing for Company Approval.

12.5 Contractor's invoices shall comply in all respects with Company's invoicing instructions as provided for in this Agreement, including Exhibit 2 – Compensation, Exhibit 3 – Coordination Procedures and Exhibit 13 - Provincial Benefits.

12.6 Invoices shall be accompanied by:

- (a) all relevant supporting documentation as Company or Engineer may reasonably require to verify completion of the Work, the accuracy of the fees, charges and third party charges invoiced including copies of any relevant third party invoices, receipts and purchase orders;
- (b) timesheets Accepted by Engineer for any Work performed on a time and materials basis;
- (c) receiving reports and a summary page of all third party invoices, complete with summary sheet cross referring to all backup information;
- (d) a sworn declaration, in the form set out in Exhibit 2 - Compensation, that Contractor

has paid Subcontractors, vendors and suppliers all amounts properly due for work, services, materials and equipment supplied or performed and billed by the Subcontractors, vendors and suppliers and included in Contractor's prior invoices for which Payment Certificates have been Approved by Company; and

- (e) any other documentation Company may reasonably require.

(All invoicing requirements, information and documentation described in this **Article 12** shall hereinafter be referred to as the "**Billing Information**". Billing Information should always comprise a summary sheet with cross referencing to all backup information which demonstrates a clear audit trail substantiating all charges presented on the invoice.)

12.7 Company shall not be responsible for delays in payment due to Contractor not providing complete Billing Information.

12.8 Contractor shall submit an application for payment as follows:

- (a) For compensation based on monthly progress, Contractor shall issue to Engineer on the 25th day of each month during the performance of the Work, for Company's Approval, a Payment Certificate in the form set forth in Exhibit 3 – Coordination Procedures, that sets out:

- (i) for Work items paid on a unit price basis, the number of units completed in that month together with the unit price and total claimed for each unit price item;
- (ii) for Work items paid on a lump sum basis, the percentage completed as of the 25th of the month together with the amount claimed for each lump sum item based on the percentage completed less any amounts previously paid by Company for each such item;
- (iii) for Work items paid on a reimbursable basis, Contractor will include such reimbursable items accompanied by appropriate references to the Agreement covering such items and a summary sheet cross referencing such items to all relevant Billing Information to demonstrate a clear audit trail substantiating all such items presented with the Payment Certificate;

and accompanied by all relevant supporting documentation as Engineer or Company may reasonably require to verify the progress achieved.

- (b) For compensation based on Payment Milestones, when Contractor considers that a Payment Milestone has been completed and the criteria for completion of that particular Milestone have been achieved, it shall issue to Engineer, for Company's Approval, a Payment Certificate in the form set forth in Exhibit 3 – Coordination Procedures, together with all relevant supporting documentation as Engineer or Company may reasonably require to verify the successful completion of the relevant

Milestone criteria and achievement of the Payment Milestone.

- 12.9 Where payment is made for Work items on a unit price basis, the quantities of unit priced items in Exhibit 1 – Scope of Work and Schedule of Unit Prices in Exhibit 2 - Compensation are estimated quantities only. Any increase or decrease in the quantities of Work performed in respect of those items listed in Exhibit 1 – Scope of Work and Schedule of Units Prices in Exhibit 2 – Compensation shall not result in a change in the unit price for those items.
- 12.10 On receipt of a Payment Certificate, Engineer shall review it and the associated supporting Billing Information. If Engineer determines that:
- (a) For Work compensated on a monthly progress basis:
 - (i) the progress claimed in the Payment Certificate has been achieved, Engineer shall recommend to Company that the Payment Certificate may be Approved; or
 - (ii) the progress claimed has not been achieved, Engineer shall amend the Payment Certificate to reflect the progress actually achieved and advise Contractor in writing the reasons for the revision, and recommend to Company that the revised Payment Certificate may be Approved; and
 - (b) For Work compensated on a Payment Milestone basis:
 - (i) the Milestone has been achieved, Engineer shall recommend to Company that the Payment Certificate may be Approved; or
 - (ii) the Milestone has not been achieved, Engineer shall reject the Payment Certificate and advise Contractor in writing the reasons why the Milestone has not been achieved.
- 12.11 Upon receipt of a Payment Certificate Approved by Company, Contractor shall submit an invoice for the amount due as determined in accordance with Exhibit 2 – Compensation and the requirements of Exhibit 3 – Coordination Procedures. The invoice shall be supported by the Approved Payment Certificate and all Billing Information as Engineer or Company may reasonably require.
- 12.12 Contractor shall address invoices to:
- Labrador-Island Link Limited Partnership
350 Torbay Road Plaza, Suite No. 2
St. John's, NL
A1A 4E1
Attention: Lower Churchill Project Accounts Payable
- 12.13 If any Change affects the Contract Price, Contractor may issue an invoice for the Work

completed pursuant to the applicable Change Order, as follows:

- (a) For Change Orders carried out on a lump sum basis, Contractor shall comply with the requirements outlined in **Articles 12.5** through **12.12** in the same manner as if the completion of the Change Order Work is payable by monthly progress or constitutes a Payment Milestone.
- (b) For Change Orders carried out on a reimbursable basis, Contractor shall include that portion of the Change completed in the previous month in its application for payment pursuant to **Article 12.8(a)** accompanied by all Billing Information including an executed copy of the relevant Change Order, a copy of time sheets Accepted by Engineer, daily progress reports and any other information as Engineer may require to verify the progress, completion and associated charges pertaining to the Change. The final invoice for reimbursable Changes shall also include any information as Engineer may reasonably require to verify the successful completion of the Change.

12.14 If Contractor fails to comply with the requirements of **Article 12.6**, the Work shall be deemed incomplete and Company may withhold monies otherwise payable to Contractor and/or return invoices to Contractor for resubmission until such Billing Information has been provided to the satisfaction of Company.

12.15 Within thirty (30) days following Engineer's receipt of a properly prepared invoice, accompanied by acceptable Billing Information in accordance with **Article 12**, Company shall pay to Contractor the amount stated to be due, subject to all of the following:

- (a) Company shall be entitled to withhold from such payment any amount(s) required by Applicable Laws or permitted hereunder.
- (b) Notwithstanding the foregoing, if Engineer disputes any item charged in any invoice, Engineer shall notify Contractor of the disputed item specifying the reason therefor. Payment of such disputed item shall be withheld until settlement of the dispute, provided that payment shall be made on the undisputed portion.
- (c) Company shall be entitled to set off amounts which it owes to Contractor under this Agreement or any other agreement against amounts which Contractor owes to Company under this Agreement or any other agreement.
- (d) For any payments made by Company to Contractor by electronic transfer, Contractor shall provide Company with the necessary banking information to facilitate electronic transfer of funds to Contractor's bank. Any changes in Contractor's banking information or payment instructions shall be submitted in writing to the Company Representative. The Company shall not be held liable or responsible for errors or delays resulting from incorrect or delayed submission of changes in banking instructions.

12.16 Company shall be entitled to deduct and shall retain from each payment a ten percent

(10%) holdback pursuant to the *Mechanics' Lien Act*, R.S.N.L 1990, c.M-3. Company shall release the holdback funds in accordance with **Article 25.3**.

12.17 Company shall be entitled to withhold payment, or to deduct from Contractor's compensation, any amounts associated with:

- (a) invoiced items reasonably disputed by Company;
- (b) Contractor's failure to make payments promptly when due and owing to Subcontractors, agents, or suppliers;
- (c) Contractor's failure to remit or pay any Tax or make any other payment required under Applicable Laws where Company, acting reasonably, determines that any such remittance or payment may be assessed against the Company;
- (d) Defects in the Work not remedied;
- (e) liens or claims filed or registered against property with respect to the Work; and
- (f) any other matter as permitted or required by Applicable Laws or as expressly provided in Exhibit 2 – Compensation, or elsewhere in this Agreement.

12.18 Company's obligation to pay any amounts to Contractor under this Agreement is subject to the following terms and conditions, which are inserted for the sole benefit of Company and may be waived by Company in whole or in part in respect of any payment, without prejudicing the rights of Company at any time to assert such terms or conditions in respect of any subsequent payment, namely:

- (a) no notice of claim for lien shall have been given in connection with the Work or if a notice of such a claim for lien shall have been given, such claim shall have been released, vacated or, if applicable, removed from title or the claim shall have been secured through the delivery of a bond in respect of the full amount of the claim;
- (b) there shall exist no default, or any event which, with the passage of time or the giving of notice or both, would constitute a default on the part of Contractor; and
- (c) Company shall have received such other documents or satisfied such other conditions as Company or its project lenders may reasonably require and which are material to the Work.

12.19 If either Party fails to make payments as they become due under the terms of this Agreement or under an award by arbitration or Court, interest at the three (3) month Treasury Bill rate, as published by the Bank of Canada for the period in question, on unpaid amounts will also be due and payable until payment. Interest will apply at the rate and in the manner prescribed by this Article on the amount of any claim settled pursuant to **Article 30** from the date the amount would have been due and payable under this Agreement, had it not been in dispute, until the date it is paid.

- 12.20 For greater certainty, Contractor and Company acknowledge that, notwithstanding any other provision of this Agreement, any amounts payable by Company to Contractor pursuant to this **Article 12** are exclusive of any HST as payable pursuant to section 165 of the *Excise Tax Act* (Canada), R.S.C. 1985, c. E-15. If Contractor is required to collect from Company an amount of HST with respect to the provision of any goods or services supplied pursuant to this Agreement, then Company, subject to compliance by Contractor with **Articles 12.21** and **12.22**, shall pay the amount of such HST to Contractor.
- 12.21 Contractor represents and warrants that it is now and shall remain registered for the purposes of the HST in accordance with Part IX of the *Excise Tax Act* (Canada), R.S.C. 1985, c. E-15, for the Term and that its HST Registration number is 102368024RT0001.
- 12.22 Contractor shall provide, at all times when any HST is required to be collected, such documents and particulars relating to the supply as may be required by Company to substantiate a claim for any input tax credits as may be permitted pursuant to the *Excise Tax Act* (Canada), R.S.C. 1985, c. E-15, in respect of such HST. Without limiting the foregoing, Contractor shall include on all invoices issued pursuant to this **Article 12** all of the following particulars:
- (a) HST registration number of Contractor;
 - (b) the subtotal of all taxable supplies;
 - (c) the applicable HST rate(s) and the amount of HST charged on such taxable supplies; and
 - (d) a subtotal of any amounts charged for any "exempt" or "zero-rated" supplies as defined in Part IX of the *Excise Tax Act* (Canada), R.S.C. 1985, c. E-15.

ARTICLE 13 TAXES

- 13.1 Contractor acknowledges that it shall be carrying on business in the Province of Newfoundland and Labrador (and elsewhere as applicable) during the performance of the Work and agrees to prepare and to file in a timely manner all Tax returns or declarations required by any applicable Authority or Applicable Laws having jurisdiction over this Agreement or any portion thereof. Contractor shall lawfully discharge its Tax obligations.
- 13.2 Subject to the obligation of the Company to pay HST pursuant to **Article 12.20**, Contractor shall pay all Tax and shall use its best efforts to ensure payment by Subcontractors of all Tax which may be lawfully assessed upon Contractor or any Subcontractor by any Authority having jurisdiction over Contractor, Subcontractor or this Agreement.
- 13.3 Contractor represents that Contractor's residence status for the purposes of Canadian income tax legislation is as set forth in Exhibit 10 – Declaration of Residency. Contractor shall advise Company of the country where Contractor is a resident for income tax purposes and shall give thirty (30) days Notice to Company and obtain its prior written consent before

making or allowing any change to its tax residency status. If Contractor obtains, and provides to Company a copy of, an income tax waiver from the Canada Revenue Agency (CRA) waiving a non-resident tax source deduction as may be required by Canadian income tax legislation, Company agrees not to withhold any such income tax deduction to the extent waived so long as the waiver is and remains in force. In any event, Contractor further agrees to be liable for all such Taxes and shall indemnify Company in respect thereof pursuant to **Article 21.9** of this Agreement.

- 13.4 If required by the Applicable Laws of any country having jurisdiction, Company shall have the right to withhold amounts, at the withholding rate specified by such Applicable Laws, from any compensation payable for the Work performed by Contractor Group, and any such amounts paid by Company to an Authority pursuant to such Applicable Laws shall, to the extent of such payment, be credited against and deducted from amounts otherwise owing to Contractor hereunder. Contractor shall note on each invoice whether any portion of the Work covered by such invoice was performed inside or outside of Canada for the purposes of Canadian income tax legislation or such other information requested or required by Company to properly assess withholding requirements. At the request of the Contractor, Company shall deliver to Contractor properly documented evidence of all amounts so withheld which were paid to the proper Authority for the account of Contractor.
- 13.5 Contractor shall supply and arrange for all Contractor's Personnel to supply Company with all information relating to the activities under this Agreement that is necessary to enable Company or its Affiliates to comply with the lawful demand for information by any Authority. In the event Contractor does not supply or take all steps to arrange for any Subcontractor to supply such information and, as a result, an Authority imposes a Tax or fine upon Company or any of its Affiliates, Contractor shall forthwith pay or reimburse Company or any of its Affiliates for such Tax or fine.
- 13.6 Subject to the obligation of Company to pay HST pursuant to **Article 12.20**, the Contract Price shall include, and Contractor shall be responsible for, all Taxes which Contractor or Company is obliged pursuant to Applicable Laws to pay and does pay, for the purchase, sale, importation and exportation of the Work, or Contractor's Items, or personal property of any member of Contractor Group. Except as otherwise expressly provided herein, Contractor shall be the "importer of record" for the purpose of importing into Canada all Contractor's Items and the Work, or any part thereof, and shall pay all Taxes payable in respect of all such importations.
- 13.7 Contractor shall obtain for the benefit of Company all available exemptions from or recoveries of Taxes and shall employ all prudent mitigation strategies to minimize the amounts of Taxes required to be paid in accordance with Applicable Laws. In the event Contractor obtains any rebate, refund or recovery in respect of any such Taxes, it shall immediately be paid to Company to the extent that such amounts were paid by Company or reimbursed to Contractor by Company.
- 13.8 Notwithstanding any other provision of this Agreement, Contractor Group shall not make any statement, representation, filing, return or settlement regarding Taxes on behalf of

Company to an Authority without the prior Approval of Company.

- 13.9 For greater certainty, Contractor and Company acknowledge that, notwithstanding any other provision of this Agreement, any amounts payable by Contractor to Company pursuant to this Agreement are exclusive of any HST payable pursuant to the *Excise Tax Act* (Canada), R.S.C. 1985, c. E-15 or any other Taxes exigible in respect of such amounts payable. If Company is required to collect from Contractor an amount of HST or other Taxes with respect to any such amounts payable pursuant to this Agreement, then Contractor shall pay the amount of such HST or other Taxes to Company. If the amounts payable by Contractor to the Company pursuant to this Agreement are deemed by any Applicable Law to include an amount of HST or other Taxes, the amount otherwise payable pursuant to this Agreement shall be increased to the extent necessary so that the amount payable to the Company, net of such HST or other Taxes, is equal to the amount that would have been payable to the Company if such HST or other Taxes were not deemed to have been included in such amount.
- 13.10 For greater certainty, anti-dumping duties, countervailing duties and the like shall, in all cases, be borne by Contractor. Should any such duties become payable by Company, Contractor shall be liable for and defend, protect, release, indemnify and hold Company harmless from and against any such duties, together with any interest, penalties and reasonable costs related thereto, and Contractor shall immediately provide Company with sufficient funds to pay such duties and other amounts in full. If Company has already paid such duties or other amounts, Contractor shall reimburse Company, on demand, the full amount of such duties and other amounts so paid.

ARTICLE 14 CHANGES IN THE WORK

- 14.1 Company has the right to make a Change at any time and from time to time during the performance of the Work by issuing a Change Order. Contractor shall implement all Changes required by Company. Compensation for a Change shall be determined in accordance with Exhibit 2 – Compensation and Exhibit 3 – Coordination Procedures.
- 14.2 Contractor shall not perform and shall not be entitled to any compensation for a Change without a Change Order issued by the Company to the Contractor for the Change.
- 14.3 Contractor shall commence with and shall execute all Changes with all due diligence immediately upon receipt of a Change Order issued by Company.
- 14.4 Contractor shall comply with the requirements of Exhibit 3 – Coordination Procedures in the development of the pricing, impacts on resources and schedule as it relates to a Change and present a comprehensive proposal covering the Change to Company for Approval.
- 14.5 Except to the extent expressly provided in a Change Order, no Changes shall vitiate or invalidate or be deemed to amend or be deemed to constitute a waiver of any provision of this Agreement. All Changes shall be governed by all the provisions of this Agreement.

Changes will not result in any limitation of Contractor's Warranty under **Article 17**.

- 14.6 In the event the Parties fail to reach agreement on the pricing and impacts on resources and schedule with respect to a Change, Contractor shall perform the work specified in the Change Order as issued by Company and either Party may give a Notice of the Dispute which will be handled in accordance with **Article 30** but in no case shall the price of any Change exceed an amount determined in accordance with **Article 14.10**.
- 14.7 If Contractor considers that a Change is necessary or desirable, Contractor may request a Change Order by submitting a Change Request in writing to Engineer in accordance with the procedure set out in Exhibit 3 – Coordination Procedures.
- 14.8 If Contractor considers that an occurrence has taken place which constitutes a Change, then Contractor shall, within ten (10) Business Days of the occurrence, contact Engineer and request a Change Order, by submitting a Change Request to Engineer in accordance with the procedure set out in Exhibit 3 – Coordination Procedures. If Company:
- (a) agrees that the occurrence constitutes a Change, then Company shall issue a Change Order in respect of the Change;
 - (b) disagrees that the occurrence constitutes a Change, Contractor shall proceed with the Work without delay and such continuation of the Work shall be without prejudice to Contractor's rights to advance a Dispute under **Article 30**.
- If Contractor fails to comply with the conditions of this **Article 14.8**, it will relinquish its right to request a Change Order and waives any claim it may have for additional compensation and for an extension of time to complete a Milestone arising from the occurrence.
- 14.9 Changes shall be invoiced and paid for in accordance with **Article 12**, Exhibit 2 – Compensation and Exhibit 3 – Coordination Procedures. Cost of the work carried out under a Change Order will reflect any discounts, rebates, refunds or free material credits earned with purchase of material or other goods and services charged under a Change.
- 14.10 The adjustment in the Contract Price for a Change carried out prior to agreement by Contractor and Company on the price for the Change shall be determined on the basis of the cost of expenditures and savings to perform the work attributable to the Change as determined in accordance with **Articles 14.11** and **14.12(a)** plus overhead and profit as follows:
- (a) to the extent rates and prices in Appendices A, C and D of Exhibit 2 – Compensation apply, there shall be no allowance for overhead and profit;
 - (b) to the extent rates and prices in Exhibit 2 – Compensation do not apply:
 - (i) if a Change results in a net increase in the Contract Price, an allowance for overhead and profit will be included at the rates referenced in Section 5(b) of Exhibit 2 - Compensation;

- (ii) if a Change results in a net decrease in the Contract Price, the amount of the credit to Company will be the net cost with a corresponding five percent (5%) deduction for overhead and profit; and
- (iii) when both additions and deletions covering related work or substitutions are involved in a change in the Work, the allowance or deduction for overhead and profit will be calculated on the basis of the net increase or decrease, if any, with respect to that change in the Work.

14.11 Contractor shall keep and present in such form as Company may require an itemized accounting of the cost of expenditures and savings referred to in **Article 14.10** together with supporting data. The cost of performing the work attributable to the Change shall be limited to the actual cost incurred by Contractor for the performance of the work attributable to the Change, using any applicable rates and prices in Exhibit 2 – Compensation, where the actual cost shall be limited to:

- (a) wages (including applicable Taxes) and benefits paid for labour in the direct employ of Contractor under applicable collective bargaining agreements;
- (b) the cost (including cost of transportation) of all equipment, material products incorporated into the Work less any trade discounts;
- (c) the cost (including cost of transportation) of materials, supplies, equipment and maintenance thereof, which are consumed, less any trade discounts and less salvage value on such items used but not consumed and which remain the property of Contractor;
- (d) rental cost of all tools, machinery and equipment, exclusive of hand tools, whether rented from or provided by Contractor or others;
- (e) deposits lost;
- (f) the amounts of all costs arising out of Subcontracts;
- (g) the cost of quality assurance such as independent inspection and testing services;
- (h) any adjustment in duties, and bonding and/or insurance costs, for which Contractor is liable; and
- (i) the cost of removal and disposal of waste products and debris.

14.12 If the quantity of the Work is decreased or any part of the Work is deleted:

- (a) to the extent possible, the value of any deletion or reduction in the Work shall be determined using the rates and prices set out in Exhibit 2 – Compensation; and
- (b) Contractor shall not be entitled to claim any indirect or consequential damages,

including loss of profits or loss of revenue.

- 14.13 If at any time after the start of the work directed by a Change Order for which there was no agreement on price, Company and Contractor reach agreement on the adjustment to the Contract Price and any adjustment to Exhibit 9 – Work and Milestone Schedule, this agreement will be recorded in an amendment to the Change Order issued by Company.
- 14.14 If there is a change in Applicable Laws which makes modifications to the Work necessary or advisable, Company shall advise Contractor of the change in Applicable Law and shall present to Contractor a proposal for such modifications required as a result of the change in Applicable Law. On receipt of such proposal, Contractor shall prepare and provide to Company the following:
- (a) details of the effect, if any, on the costs of the Work;
 - (b) details of the impact, if any, on dates for completion of Milestones and/or the Technical Requirements; and
 - (c) details of the impact on the Contract Price.

ARTICLE 15
HEALTH, SAFETY AND ENVIRONMENTAL PROTECTION

- 15.1 Contractor shall be responsible for ensuring the health and safety of all Contractor's Personnel who are engaged in the performance of the Work and also be responsible for environmental management. Without limiting the foregoing, Contractor shall:
- (a) ensure that all Contractor's Items are maintained in safe, sound and proper condition and capable of performing the function for which each is intended and meets all industry standards and Applicable Laws;
 - (b) cease all activities in the area of any identified health, safety or environmental problem until such problem is resolved;
 - (c) immediately report to Engineer all health, safety and environmental problems and hazards;
 - (d) provide sufficient supervision, instruction and resources to ensure that Contractor Group's Work execution and Worksites comply with all Applicable Laws and good environmental practices;
 - (e) at its own expense and in accordance with Applicable Laws, supply and maintain Contractor's Personnel with personal protective equipment which shall be worn and used on all occasions as indicated by notices, instructions, good practice or as required by risk assessment;
 - (f) conduct such drills and tests of Contractor's Items, equipment, Personnel and

procedures to ensure that they are available, trained and in place, respectively, for immediate and effective action in the event of emergency;

- (g) comply with Company's emergency response requirements as described in Exhibit 11 – Company Supplied Documents;
- (h) cooperate fully and comply with any directions given by Authorities, including the police, safety and environment regulatory officials and fire authorities; and
- (i) report to Engineer monthly training compliance and safety statistics as identified by Engineer.

15.2 Contractor shall develop and submit to Engineer for Acceptance a detailed health and safety plan for the Work which demonstrates that, in connection with Contractor's performance of the Work, Contractor has identified risks pertaining to the health and safety of Contractor's Personnel, and that effective controls are implemented to prevent accidents and health and safety threats. Contractor's plan shall:

- (a) satisfy the requirements of Exhibit 5 – Health and Safety Requirements;
- (b) be structured in accordance with various elements within the Work such as fabrication, transportation, installation and commissioning;
- (c) include measurable, achievable targets for health and safety performance, including: lost time frequency; total recordable frequency; injury severity data; and first aid cases;
- (d) comply with Company's safety policies and procedures set out or described in Exhibit 11 – Company Supplied Documents; and
- (e) comply with Applicable Laws and Exhibit 3 – Coordination Procedures.

15.3 Contractor shall develop and submit to Engineer for Acceptance a detailed environmental protection plan for the Work which demonstrates that, in connection with Contractor's performance of the Work, Contractor has identified risks pertaining to the environment and that effective controls are implemented to prevent threats and damage to the environment. Contractor's plan shall:

- (a) satisfy the requirements of Exhibit 6 – Environmental and Regulatory Compliance Requirements;
- (b) be structured in accordance with various elements within the Work such as fabrication, transportation, installation and commissioning;
- (c) include measurable, achievable targets for performance, including: performance criteria for environmental emissions and waste, and hazardous materials; and

- (d) include an environmental management plan that satisfies the Technical Requirements and Applicable Laws.
- 15.4 Engineer, on behalf of Company, shall Accept Contractor's plans required by **Articles 15.2** and **15.3** provided the plans comply with this Agreement, Applicable Laws and any ordinances, orders and decrees of any Authority having jurisdiction over health, safety and environmental compliance of the Work or the Worksite and any other requirements of Company.
- 15.5 Contractor shall comply with all such standards and the provisions of the plans required by **Articles 15.2** and **15.3**, along with any changes thereto as Contractor may be notified from time to time by Engineer, and all Applicable Laws relating to occupational health, safety and environmental protection. Contractor shall ensure that all Contractor's Personnel involved in the performance of the Work comply with the provisions of Contractor's health, safety and environmental plans and all Applicable Laws relating to occupational health, safety, and environmental protection. Contractor shall appoint a safety officer who shall assist Contractor in safety matters relating to Contractor's Personnel.
- 15.6 Contractor shall promptly investigate and report to Engineer and Authorities having jurisdiction any near miss incidents or any accidents resulting in injury, death or illness to any of Contractor's Personnel engaged in the performance of the Work, any criminal acts, any damage to property or any adverse impact on the environment and any release of substances hazardous to the environment.
- 15.7 Contractor shall submit to Engineer for Acceptance Contractor's drug and alcohol policy which shall be in compliance with Applicable Laws. Contractor shall ensure that Contractor's Personnel who are engaged in the performance of the Work, are familiar with, and comply with, Contractor's drug and alcohol policy.
- 15.8 Company shall have the right to suspend performance of the Work for as long as necessary to prevent or stop any violation of this **Article 15**. During such period of suspension, Contractor shall not demobilize from the Worksite. No compensation shall be payable to Contractor by Company and the Contractor shall not be entitled to compensation for any costs it incurs as a result of the suspension.
- 15.9 Company reserves the right to audit and inspect the Worksites to verify compliance with this Agreement, which audits and inspections may be performed by Engineer or such other third party as Company may direct.
- 15.10 Notwithstanding **Article 39.6**, in the event Company declares an emergency with respect to any matter affecting health, safety, the environment or potential damage to or loss of property, Contractor shall comply with verbal instructions issued by Company or Engineer with respect to such emergency. Company or Engineer shall confirm such instructions in writing at the first reasonable opportunity.
- 15.11 Contractor shall exercise all diligence to conduct operations under this Agreement in a

manner that will prevent any adverse impact to the environment including seepage, discharge or escape of pollutants, hazardous substances, debris and damage to or destruction of habitat. Contractor shall be responsible for all risks and costs to:

- (a) handle, dispose and/or cleanup those hazardous substances, if any, identified in Exhibit 11 – Company Supplied Documents in respect of the Sites;
- (b) handle, dispose and/or cleanup those hazardous substances brought to Worksites by Contractor Group and discharged in connection with or incidental to the performance of or default in any of Contractor's obligations under this Agreement;
- (c) handle, dispose and/or clean up those hazardous substances existing on a Site that is released or discharged due to Contractor's negligence or breach of contract;
- (d) remediate any environmental damage arising from occurrences described in paragraphs (a), (b) and (c) above, including the removal and cleanup of any pollution, debris and hazardous substances;
- (e) take such measures as are necessary in the circumstances to prevent or mitigate any environmental damage resulting from any pollution, seepage or discharge or escape of pollutants, debris and hazardous substances; and
- (f) take such measures that Contractor or Company is under instructions to take from any Authority having jurisdiction to so instruct.

15.12 If Contractor:

- (a) encounters hazardous substances at a Site; or
- (b) has reasonable grounds to believe that hazardous substances are present in or on or under any of the Worksites which are not disclosed in the Exhibit 11 – Company Supplied Documents or are present in or on or under or migrating from any other sites;

Contractor shall:

- (c) take all reasonable steps to secure such Site, including stopping the Work, to ensure that no individual suffers an injury, sickness or death and that no property is injured or destroyed as a result of exposure to the presence of the hazardous substances;
- (d) immediately report the circumstances to Engineer in writing; and
- (e) report the circumstances to Authorities as required by Applicable Laws.

15.13 If hazardous substances are encountered during the Work, Contractor shall employ best practices and methods so as to minimize the costs of any work which may be required to handle and dispose of the hazardous substances and any environmental cleanup and to

meet the requirements of Applicable Laws or Authorities as a result thereof.

- 15.14 Subject to **Article 15.11(c)** but otherwise notwithstanding any other provision in this Agreement, Contractor shall not be responsible or liable for any pre-existing hazardous substances at Site. Should Contractor discover such materials while performing the Work, Contractor's sole obligations shall be limited to the requirements of **Articles 15.12** and **15.13**. To the extent such discovery of hazardous substances constitutes a Change, Contractor shall be entitled to seek a Change Order in accordance with **Article 14.7** or **14.8**.

ARTICLE 16
ACCESS, INSPECTION, TESTING, AUDIT

16.1 Contractor shall:

- (a) keep one copy of the current Agreement, submittals, reports, construction documents (including working plans or drawings, "issued for construction" drawings, Technical Specifications and shop drawings) and records of meetings at the Worksites, in good order and available for inspection by Company and Engineer; and
- (b) maintain, and shall require each Subcontractor to maintain, in accordance with generally accepted accounting principles and practices satisfactory to Company, books, records, expense accounts and accounts pertaining to the provision of the Work, including Contractor's and Subcontractors' personnel records, correspondence, instructions, receipts, vouchers, memoranda, tapes, data, models, data stored in computer libraries and such other documentation and related systems of controls necessary for an accurate audit and verification of costs of the Work provided and general contract compliance.

16.2 The Company Group may:

- (a) at any time, without notice, have access to all Work being conducted on the Worksites;
- (b) upon reasonable notice, have access to any and all other premises where Contractor or any Subcontractor carries on any activity in any way relating to the Work, the LCP or this Agreement or where any test results, samples, books, records, accounts and documents are kept relating to the Work or this Agreement; and
- (c) upon reasonable notice, have access to such test results, samples, books, records, accounts and documents and be authorized to examine and make copies, including electronic copies, of all such test results, samples, books, records and documents and such other documents and systems as may be related to this Agreement and shall be authorized to interview Contractor's Personnel as may be necessary for an accurate audit and verification of costs of the Work provided and general contract compliance.

16.3 Notification of any claims made or discrepancies disclosed by an audit shall be made in

writing to Contractor. Contractor and Company shall diligently attempt to resolve and agree upon such audit claims or discrepancies. Upon an audit claim or discrepancy being resolved and agreed upon, Contractor shall forthwith reimburse Company for any monies due as a result of such agreement or determination. Company may set off any amounts owed to it by Contractor for audit claim or discrepancies against any payments owed to Contractor by Company.

- 16.4 Contractor shall not be reimbursed for any costs it may incur as a result of Company conducting an audit pursuant to this **Article 16**. All such audits shall be conducted during normal business hours of Contractor and Company shall give reasonable notice to Contractor of the audit and shall specify the matters which are the subject of the audit.
- 16.5 Contractor shall provide, and shall cause the Subcontractors to provide, Company and Engineer with all requested information and documentation with respect to the Work and this Agreement, and access thereto on a timely basis.
- 16.6 Company's rights of access, inspection, testing and audit pursuant to this Agreement shall expire seven (7) years after the satisfaction of all of the obligations of Contractor pursuant to this Agreement.
- 16.7 The existence or exercise by Company or Engineer of its rights of access, inspection and audit shall not in any manner reduce or limit the obligations and responsibilities of Contractor pursuant to this Agreement.
- 16.8 Contractor shall provide sufficient, safe and proper facilities at all times for the inspection and testing activities by Company Group and all inspection and testing activities by Authorities.
- 16.9 Contractor shall:
- (a) prepare and maintain at all times copies of all test results and samples and, in accordance with principles and practices satisfactory to Company, proper, accurate and complete books, records, accounts and documents in which fair and proper entries shall be made of all activities and transactions in respect of the Work and this Agreement;
 - (b) ensure that Company Group Personnel has access to such test results, samples, books, records, accounts and documents in accordance with **Article 16.2** in order that Company and Engineer may exercise rights of inspection and audit; and
 - (c) ensure that such test results, samples, books, records, accounts and documents shall not be destroyed until Company's rights of access, inspection and audit have expired or, if arbitration or Court proceedings to which such test results, samples, books, records, accounts and documents are relevant have been commenced, until such arbitration or Court proceedings have been finally concluded.

- 16.10 Company and Engineer shall each have the right at any time to conduct such on-site observations and inspections and such civil, structural, mechanical, electrical or other tests of the Work as Company or Engineer deem desirable to ascertain whether the Work complies with this Agreement. Company shall pay for any test, observation or inspection requested by Company, and the costs of such tests, observations or inspections (including the cost of any work reasonably necessary to restore any aspect of the Work to a condition or state that existed prior to the conduct of such test, observation or inspection) shall be borne by Company unless such test, observation or inspection reveals the failure of the Work to comply with this Agreement, in which event Contractor shall correct the Work and reimburse Company for the costs of such tests, observations and inspections.
- 16.11 Contractor shall give Engineer reasonable notice of its schedule with respect to inspections or testing of the Work in progress prior to its covering or completion, which notice shall be sufficient to afford Engineer a reasonable opportunity to conduct a full inspection of such Work.
- 16.12 Contractor shall, at Engineer's request, take apart or uncover for inspection or testing any previously covered or completed Work. The cost of uncovering, taking apart or replacing such Work shall be borne as follows:
- (a) by Contractor, if such observation or test reveals that the Work does not comply with this Agreement; or
 - (b) by Company, if such observation or test reveals that the Work complies with this Agreement.
- 16.13 Within five (5) Business Days of Notice by Company to Contractor, Contractor shall deliver to Company the most recent annual audited financial statements of Contractor.

**ARTICLE 17
WARRANTY**

- 17.1 Contractor agrees that it shall at its own expense promptly:
- (a) for a period of one (1) year following the date of Substantial Completion shown on the Substantial Completion Certificate:
 - (i) correct any Work which is not in accordance with this Agreement;
 - (ii) rectify and make good or cause to be rectified and made good all Defects, other than Latent Defects, in the Work which are detected and discovered;
 - (iii) have available at the Worksites or at a proximate location to the Worksites all necessary equipment, spare parts and labour to comply with the foregoing obligations; and
 - (b) for Latent Defects, rectify and make good or cause to be made good all Latent

Defects in the Work which are detected and discovered at any time.

- 17.2 Contractor shall provide to Company a products and workmanship warranty on any products, materials, and equipment incorporated into the Work to remain in effect for one (1) year from the date of Substantial Completion shown on the Substantial Completion Certificate. Such warranties shall provide for replacement of the component parts of such products or equipment or replacement of materials and shall cover incidental direct costs incurred by Company arising out of Defects in or failure of the warranted product, materials, or equipment.
- 17.3 Company shall notify Contractor of any Defects or Latent Defects in the Work or any such failure in respect of any item of Work as soon as practicable after Company becomes aware of them and shall stipulate a reasonable period of time within which the Defect or Latent Defects or failure is to be rectified. Contractor shall rectify any such Defect or Latent Defects or any such failure within the time stipulated therein. Notice of any Defect discovered during the period set out in **Article 17.1(a)** must be given to Contractor no more than sixty (60) days after the end of the period in **Article 17.1(a)**.
- 17.4 Contractor shall secure for the benefit of Company, written warranties from the Subcontractors who provide or cause to be provided equipment, materials and/or systems which warranties shall include the terms set forth in **Article 17.2**.
- 17.5 Contractor will correct or pay for damage resulting from corrections made under the requirements of **Article 17**.
- 17.6 No payment by Company under this Agreement nor partial or entire use or occupancy of the Work by Company shall constitute an Approval of any portion of the Work which is not in accordance with this Agreement or a waiver by Company of any of the requirements of this Agreement.
- 17.7 Nothing in this Article shall be construed so as to prejudice, restrict, limit, waive or otherwise diminish the rights and remedies of Company at law with respect to latent Defects. Without limiting the foregoing, nothing in this Article shall be construed so as to restrict, limit, waive or otherwise diminish Contractor's warranty of adequacy of the Work and Contractor guarantees that:
- (a) all material will be new and free from Defects;
 - (b) all Work will be of a good and workmanlike quality;
 - (c) to the extent that Contractor is responsible for design under this Agreement, the Work applicable to such design shall be fit for purpose, as more specifically set forth in this Agreement, and where no purpose is specified, fit for its intended use; and
 - (d) the Work shall be free from Defects, including latent Defects.
- 17.8 If Contractor does not fulfill its requirements under this **Article 17** or fails to fulfill its

requirements within the period set by Company, within five (5) Business Days of Notice to Contractor by Company, Company may have the Work which is the subject of the Notice from Company corrected by a third party at the sole cost of Contractor. Such recourse shall in no way relieve Contractor from its Warranty obligations.

- 17.9 This Agreement sets out the sole and exclusive warranty remedies of Company with respect to the Work, and Contractor provides no, and it hereby expressly disclaims any other warranties, express or implied, written or oral, by operation of law or otherwise, arising or related to the Work or this Agreement. Notwithstanding any provision to the contrary in this Agreement, and without limiting the generality of the foregoing, the Parties agree that there are no implied or other warranties that may arise from trade usage or custom.

ARTICLE 18 CONTRACTOR INSURANCE

- 18.1 Contractor will procure insurance policies in accordance with the requirements of **Article 18.3** from a financially sound insurance company and which is acceptable to Company. If Contractor fails to procure such policies or fails to provide certificates of insurance confirming such coverage in a form and with content acceptable to Company within the time specified in **Article 18.2**, or if any insurance is cancelled and not immediately replaced with comparable insurance to the satisfaction of the Company, then Company may at any time by Notice to Contractor terminate the Agreement.
- 18.2 Prior to commencing work at the Site or within ten (10) Business Days following the Effective Date, whichever is earlier, Contractor shall submit to Company certificates of insurance or such other documentation as Company may require evidencing the insurance required by **Article 18.3**. Failure of Company to advise Contractor of any insurance deficiencies shall not relieve Contractor of any liability related to its obligations under this **Article 18**. On written request by the Company to the Contractor, the Contractor shall provide copies of insurance policies obtained by the Contractor in accordance with **Article 18.3**.
- 18.3 Contractor shall at all times while conducting the Work carry at least the following insurance, with limits not less than those specified below, covering property and liability outside the scope of insurance supplied by Company pursuant to **Article 20.1**. The cost of insurance procured by Contractor, including deductibles or self-insurance or policy retentions, shall be for the sole account of Contractor.

(a) Workers' Compensation

Workers' Compensation coverage for all of its Personnel engaged in the Work in accordance with the Applicable Laws of the jurisdictions in which the Work is performed. Contractor shall further ensure that non-residents are fully covered by Workers' Compensation insurance and Employer's Liability insurance with such coverage including an extraterritorial benefits extension providing benefits at least equal to those provided by the jurisdiction in which the Work is performed.

(b) Employer's Liability

Employer's Liability insurance, with limits as required by Applicable Laws, but not less than Canadian five million dollars (\$5,000,000.00) covering each employee engaged in the Work.

(c) Comprehensive General Liability

Comprehensive General Liability insurance written on an occurrence basis with limits of not less than Canadian five million dollars (\$5,000,000.00) per occurrence for bodily injury and/or property damage including contractual liability, sudden and accidental pollution liability for risks assumed by Contractor, broad form property damage, personal injury, contractor's protective liability, completed operations for a period of not less than twenty-four (24) months, contingent employer's liability and incidental medical malpractice.

(d) Automobile Liability Insurance

When not otherwise covered by Contractor's Comprehensive General Liability policy, Contractor shall obtain and maintain in effect automobile liability insurance covering all licensed vehicles whether owned, non-owned, leased or hired. Such insurance will provide a minimum combined single limit of liability for bodily injury and property damage of Canadian five million dollars (\$5,000,000.00) per occurrence.

(e) Owned and Non-owned Aircraft

To the extent that aircraft are used in the performance of the Work, owned and/or non-owned aircraft liability insurance with a combined single limit of not less than Canadian ten million dollars (\$10,000,000.00).

(f) Property

"All risks" property insurance covering all real and personal property which Contractor owns, leases or has in its care, custody or control including all machinery and equipment to be used for the Work but not forming part of the Work.

(g) Property in Transit

If required by Exhibit 2 – Compensation, Contractor shall provide property insurance coverage for the full value of equipment, goods, products and materials to be incorporated into the Work with such coverage to apply during transportation from Contractor's plant, factory or distribution centre to the location for delivery, with a maximum deductible of Canadian twenty-five thousand dollars (\$25,000.00).

(h) Subcontractors

Contractor is required to ensure that each of the Subcontractors provides insurance similar to the foregoing, as well as insurance which:

- (i) is required by Applicable Laws; or
- (ii) is reasonably appropriate in respect of the Work to be performed.

When requested to do so by Company, Contractor shall provide or cause to be provided to Company certified copies of such Subcontractor insurance policies or such other evidence of insurance acceptable in form and content to Company acting reasonably. Contractor Group shall not perform the Work during any period when any required policy of insurance is not in effect.

(i) Other

In addition to the insurance coverage specified above, Contractor shall carry such other insurance policies and in such amounts:

- (i) as may be required in order to comply with Applicable Laws; and
- (ii) as directed by Company with regard to liabilities assumed under the Agreement or in respect of specific activities performed for the Work.

- 18.4 All insurance policies required to be obtained by Contractor in accordance with **Article 18.3** shall be endorsed to waive insurer's rights of subrogation against Company Group and their Personnel, stockholders, successors, assigns and Affiliates. All liability policies required above shall name Company Group and their Personnel, stockholders, successors, assigns and Affiliates as additional insureds and shall contain cross liability and severability of interest provisions. Except with respect to the insurance coverage to be procured by Company pursuant to **Article 20.1**, all insurance policies obtained by Contractor shall operate as primary to any insurance policies maintained by Company and their Personnel, stockholders, successors, assigns and Affiliates.
- 18.5 All policies obtained by Contractor in accordance with **Article 18.3** shall be further endorsed to provide Company thirty (30) days prior Notice of cancellation or any material change in coverage.
- 18.6 Company may reduce or waive all or any portion of Contractor's insurance requirements under this **Article 18** under circumstances where the Work to be performed does not require equivalent insurance coverage. Such reduction or waiver shall be obtained in writing and shall in no way reduce or waive Contractor's responsibility or liability for the Work.
- 18.7 Nothing in this **Article 18** shall or is intended to limit the liability of Contractor under any other provision of this Agreement. The provisions of this **Article 18** will not be interpreted as relieving Contractor of any of its obligations under this Agreement. Contractor may purchase, at its own expense, any additional insurance it deems necessary.

- 18.8 Contractor shall give Company prompt notification of any claim involving the Work with respect to any of the insurance policies referred to in **Article 18.3**, accompanied by full details of the incident giving rise to such claim. Contractor agrees to do all acts, matters and things as may be reasonably necessary or required to expedite the adjustment of any loss or damage covered by insurance so as to expedite the release and disposition of such insurance in the manner and for the purposes contemplated in this Agreement. If requested by Company, Contractor shall advise Company in writing of the final resolution of any such insurance claims.

ARTICLE 19 WORKERS' COMPENSATION

- 19.1 Prior to the commencement of any Work, Contractor and all Subcontractors shall provide written confirmation to Engineer from the WHSCC of compliance with or exemption from workers' compensation requirements and confirmation that all required assessments that are due and payable have been paid.
- 19.2 Upon completion of Subcontract work, each Subcontractor shall deliver to Engineer a clearance certificate from the WHSCC.
- 19.3 Upon completion of the Work, Contractor shall deliver to Engineer a clearance certificate from the WHSCC and all Subcontractors which have not previously provided evidence of compliance with **Article 19.2** shall deliver to Engineer a clearance certificate from the WHSCC.
- 19.4 Contractor shall at all times pay, or cause to be paid, any assessment or contribution required to be paid pursuant to Applicable Laws relating to workers' compensation in respect of Contractor's Personnel and, upon failure to do so, authorizes Company, in addition to any other rights of Company under this Agreement, to withhold and remit on behalf of Contractor an amount equal to such assessment or contribution, including any interest and penalty assessed thereon.

ARTICLE 20 PROJECT INSURANCE

- 20.1 The following insurance coverages shall be procured by Company. Policies will cover Company Group, Contractor and subcontractors of every tier (but not including vendors and suppliers except to the extent a vendor or supplier performs operations at the Site) as their interests and/or liabilities may appear:
- (a) Construction All Risk (CAR) insurance, including design defect coverage to LEG2/96 or better, subject to a limit of not less than the total Contract Price, attaching on or in place and in effect as of 18-Oct-2013.
 - (b) Wrap-up liability insurance, with Company as the named insured and its Personnel, stockholders, successors, assigns and Affiliates as additional insureds, written on an

occurrence basis with limits not less than Canadian fifty million dollars (\$50,000,000.00) per occurrence for bodily injury and/or property damage including contractual liability, broad form property damage, personal injury, contractor's protective liability, completed operations for a period of not less than twenty-four (24) months, contingent employer's liability, incidental medical malpractice, cross liability and severability of interest provisions.

- (c) Pollution liability insurance, with Company as the named insured and its Personnel, stockholders, successors, assigns and Affiliates as additional insureds, written with limits not less than Canadian ten million dollars (\$10,000,000.00) per occurrence and in the aggregate.

20.2 All insurance policies required by **Article 20.1** shall:

- (a) be endorsed to waive insurer's rights of subrogation against Contractor and subcontractors of every tier (but not including vendors and suppliers except to the extent a vendor or supplier performs operations at the Site) and their Personnel, stockholders, successors, assigns and Affiliates; and
- (b) include Contractor and subcontractors of every tier (but not including vendors and suppliers except to the extent a vendor or supplier performs operations at the Site) as additional insureds.

20.3 Contractor shall be responsible for deductibles under the Construction All Risk (CAR) policy of Canadian two million dollars (\$2,000,000.00), under the wrap-up liability policy of Canadian one hundred thousand dollars (\$100,000.00), under the pollution liability policy of Canadian two hundred fifty thousand dollars (\$250,000.00), up to a maximum of five percent (5%) of the Contract Price for any one claim, provided that:

- (a) Contractor shall not be responsible for deductibles arising from claims for damage or loss caused by earth quake;
- (b) Contractor shall not be responsible for deductibles arising from claims for damage or loss caused by flood except Contractor shall be responsible for deductibles where the flood was caused or exacerbated by the acts or omissions of Contractor; and
- (c) to the extent a claim for damage or loss was caused by the negligence of Company, Company shall be responsible for that portion of the deductible which represents the proportion of fault attributable to Company.

20.4 The insurance policies required by this **Article 20** shall be in place and shall be maintained until a Final Completion Certificate has been issued, with any completed operations coverage to continue after the issuance of the Final Completion Certificate as set out in the policy.

ARTICLE 21
INDEMNITY

- 21.1 The Parties hereby agree and acknowledge that if a provision in this **Article 21** conflicts with any other provision in this Agreement, the provision in this **Article 21** shall prevail.
- 21.2 For the purposes of this Agreement, any liability assumed or indemnity given by Contractor for the benefit of Company shall be deemed to be given by Contractor for the benefit of Company, its successors and assigns, Affiliates and Personnel.
- 21.3 It is agreed and understood that the exculpatory clauses and indemnity obligations of each Party as provided in this Agreement shall apply to any and all Claims whatsoever incurred by the indemnified Party. Further and for greater certainty, nothing in this **Article 21** shall limit a Party's right to a remedy for the other Party's breach of contract.
- 21.4 Except as otherwise specifically stated in this Agreement, Company shall indemnify, keep indemnified and shall hold the Contractor harmless from and against any and all Claims by a third party which the Contractor may at any time sustain or incur by reason of or in consequence of a breach or non-performance by Company or any agent, employee or licensee for whom the Company is in law responsible arising from the performance of any of the obligations of the Company under this Agreement.
- 21.5 Contractor shall defend, indemnify, keep indemnified and shall hold Company harmless from and against any and all Claims which Company may at any time sustain or incur by reason of or in consequence of any one or more of the following:
- (a) any negligent act or omission or wilful misconduct of Contractor Group or any licensee, invitee or Person acting on behalf of any of them in connection with or incidental to the performance of or default in any of Contractor's obligations under this Agreement;
 - (b) any inaccuracy in any representation or warranty made by Contractor Group, or any other Person that delivers to Company any document, or security instrument containing any such representation or warranty pursuant to this Agreement;
 - (c) any Claims by any third party in contract, tort, under any statute or otherwise at law or in equity with respect to any breach or non-performance by Contractor Group, or any licensee, invitee or Person acting on behalf of Contractor of any of the obligations of the Contractor in respect of the performance of the Work;
 - (d) any Claims by any third party in contract, tort, under any statute or otherwise at law or in equity with respect to any injury, damages, losses, costs, and expenses arising out of a breach of contract or negligent actions or omissions or wilful misconduct of Contractor Group or any invitee, licensee or Person acting on behalf of any of them in connection with or incidental to the Work;
 - (e) any reasonable action taken by Company to mitigate or cure a breach or non-

performance by the Contractor Group of any covenant or inaccuracy in any representation or warranty pursuant to the Agreement;

- (f) any non-payment of amounts due and payable to Subcontractors, and Subcontractors' subcontractors, vendors and suppliers of every tier, resulting from furnishing of services, material, equipment, labour or otherwise in connection with the performance of Work except where Company has not paid Contractor such amounts properly due and payable;
- (g) any Claim in respect of loss or damage to the property of Contractor Group however caused unless the Claim was caused by the sole negligence or wilful act or omission by Company;
- (h) any Claims in respect of personal injury or death of Contractor's Personnel however caused and regardless of whether or not the Claim was caused by negligence, breach of agreement or breach of duty; or
- (i) any representation or holding out by Contractor that it is an agent of Company.

21.6 Contractor shall include in all of its Subcontracts, a provision stating that Subcontractors shall defend, protect, release, indemnify and hold Company harmless from and against all Claims for the death of or bodily injury to Subcontractors and their respective Personnel, and for damage to or loss of the property of Subcontractors or their respective Personnel, unless the Claims were caused by the sole negligence or wilful act or omission by Company.

21.7 Except as provided in **Article 21.4**, Contractor shall:

- (a) be liable to Company for all Claims which Company may suffer, sustain, pay or incur; and
- (b) defend, protect, release, indemnify and hold Company harmless from and against all Claims which may be brought against or suffered by Company or which Company may sustain, pay or incur;

directly or indirectly on account of the death of or bodily injury to third parties, and for damage to or loss of property of third parties arising from or in connection with the performance, non-performance or purported performance of the Work except to the extent caused or contributed to by the negligence of Company or any of its Personnel.

21.8 Without limiting the generality of **Article 21.5**, Contractor shall be liable for and defend, protect, release, indemnify and hold Company harmless from and against all Claims (including any fine, penalty or demand of any Authority having jurisdiction) which may be brought against or suffered by Company or which Company may sustain, pay or incur, arising out of any failure by Contractor to comply with its obligations with respect to the environment under **Article 15**.

21.9 Without limiting the generality of **Article 21.5**, and subject to the obligation of Company to

pay HST pursuant to **Article 12.20**, Contractor shall be liable for and defend, protect, release, indemnify and hold Company harmless from and against:

- (a) any and all Taxes imposed by any Authority on any of Contractor Group in respect of this Agreement, and any and all Claims including payment of Taxes which may be brought against or suffered by Company or which Company may sustain, pay or incur in conjunction with the foregoing as a result of the failure by Contractor to pay any and all Taxes imposed as stated herein;
- (b) any and all Taxes imposed by any Authority in respect of the Work, or Contractor's Items, or any other items used by Contractor Group in the performance of the Work, or in respect of any services performed by Contractor Group in respect of this Agreement, and any and all Claims (including Taxes) which may be brought against or suffered by Company or which Company may sustain, pay or incur in conjunction with the foregoing as a result of the failure by any member of Contractor Group to pay any and all Taxes imposed as stated herein; and
- (c) all Claims of any nature in connection with the payment of any of Contractor Group, including all compensation, medical costs, Taxes (including all Canadian and foreign payroll and withholding Taxes and remittances), unemployment insurance premiums, Canada pension plan contributions and other benefits of whatever nature or as may be applicable in any jurisdiction (including any jurisdiction where the Work is performed or where the Personnel of the foregoing reside or are employed).

21.10 The liability and indemnities specified in this **Article 21** shall apply:

- (a) without limit and without regard to the cause of any Claim, including the negligence or fault (whether sole, concurrent, gross (except when gross negligence or wilful misconduct is expressly provided as an exception to a specific provision hereof), active or passive negligence) or otherwise or wilful act or omission and including strict liability, breach of contract, breach of duty (statutory or otherwise) and including any pre-existing conditions, of either Party or any other Person (including the Party or Person seeking indemnity);
- (b) whether or not any Claim is asserted to have arisen by virtue of tort, contract, quasi-contract, statutory duty, or any Applicable Laws;
- (c) whether or not any Claim is made or enjoyed by the Person sustaining the injury or loss or by the dependents, heirs, claimants, executors, administrators, successors, survivors or assigns of such Person.

21.11 The indemnities given in this **Article 21** shall apply in respect of the full liability of the indemnified Party for Claims, notwithstanding that the indemnified Party may be entitled to contribution thereto from any other Person and notwithstanding such liability may relate to the negligence of a third party, provided that in such case the indemnifying Party shall be

fully subrogated to the rights of the indemnified Party against such third party.

- 21.12 If a Claim by a third party is asserted in circumstances which gives or may give rise to indemnification under this Article, the Party against whom the Claim is asserted (the "**non-indemnifying Party**") shall forthwith give Notice thereof to the other Party (the "**indemnifying Party**") and, at the discretion of the non-indemnifying Party, the indemnifying Party shall undertake the defence of such Claim. The Parties shall consult and cooperate in respect of such Claim and in determining whether such Claim and any legal proceedings relating thereto should be resisted, compromised or settled. Each Party shall make available to the other all information in its possession or to which it has access, and which it is legally entitled to disclose, which is or may be relevant to the particular Claim. The indemnifying Party shall provide the non-indemnifying Party with reasonable information as to the progress of such Claim on a regular basis. No such Claim shall be settled or compromised without the written consent of the indemnifying Party. Notwithstanding the foregoing, if the indemnifying Party, within a reasonable time after Notice of any such Claim is given to it by the non-indemnifying Party, fails to defend such Claim, the non-indemnifying Party shall have the right to undertake the defence and compromise or settle such Claim on behalf of and for the account of the indemnifying Party.
- 21.13 During the period commencing at the time that Contractor has possession of, or control over, Work in which title has vested in Company, including items and/or services free issued by Company's Other Contractors, and until such time as Company takes care, custody and control of those items, Contractor shall:
- (a) be liable to Company for all Claims which Company may suffer, sustain, pay or incur directly or indirectly on account of damage to or loss of such Work or items or any other items free issued to Contractor; and
 - (b) defend, protect, release, indemnify and hold Company harmless from and against all Claims which may be brought against or suffered by Company or which Company may sustain, pay or incur directly or indirectly on account of damage to or loss of such Work or items or any other items free issued to Contractor.
- 21.14 Notwithstanding any other provisions of this Agreement, neither Party shall be liable under this Agreement to the other Party or its Affiliates or each of their officers, directors, employees and agents for any Claim in respect of loss of profit, loss of revenue, business interruption, loss of use, increased cost of operation or of financing, or any similar indirect or consequential damages (including punitive, exemplary and aggravated damages) resulting from, arising out of or connected with the Work or the performance, non-performance or breach of this Agreement, whether based in contract, tort, statute or any legal theory whatsoever, except that the foregoing exclusions of liability in this **Article 21.14** shall not apply to:
- (a) any payment in respect of a third party Claim for which one Party has an obligation to indemnify the other Party under this Agreement, provided that Affiliates of a Party shall be deemed not to be a third party for the purposes of this **Article 21.14**;

- (b) any liquidated damages payable under this Agreement; and
- (c) any amounts properly due and payable by Company to Contractor under any other provision of this Agreement.

21.15 Notwithstanding any other provision of this Agreement, the aggregate liability of Contractor to Company or its Affiliates or each of the officers, directors, employees and agents, including liquidated damages and all non-third party indemnity obligations, resulting from, arising out of or connected with the Work or the performance, non-performance or breach of this Agreement, whether based in contract, tort, statute or any legal theory whatsoever, shall in no event exceed the sum of one hundred per cent (100%) of the Contract Price and actual insurance proceeds received from insurance to be maintained under this Agreement, except that the foregoing limitation of liability shall not apply to Claims arising from Contractor's wilful, deliberate or intentional breach of this Agreement and Contractor's indemnity obligations resulting from or arising out of:

- (a) Claims for personal injury suffered by third parties;
- (b) Claims for property damage suffered by third parties;
- (c) fines and/or penalties imposed by any Authority;
- (d) Claims for infringement of patents and/or other intellectual property rights; and
- (e) Claims by a third party, including any Authority, for any environmental damage or loss to the extent Contractor is liable under this Agreement provided that Affiliates of a Party shall not be deemed to be a third party for the purposes of this **Article 21.15**.

ARTICLE 22

SITE AND TRANSPORT CONDITIONS

- 22.1 Contractor shall inform itself fully as to the risks and contingencies and all other data, matters and things, local or otherwise, respecting a Site, transportation routes and any other aspects of the Work necessary to satisfactorily perform the Contractor's obligations under this Agreement. Contractor shall be deemed to have been satisfied as to the suitability and availability of such Site, transportation routes including access routes to the Site, and such other aspects of the Work.
- 22.2 Contractor acknowledges and agrees that utilities and service connections may not be located as exactly shown on drawings provided by Company or Engineer. Contractor shall satisfy itself fully as to the exact location of all utilities and service connections and shall, at no additional cost, make such alterations to the Work as may be required to avoid conflicts in or damage to utilities and connections.
- 22.3 Contractor shall be solely responsible for determining the transport route for shipment of all equipment and materials for use at a Site. Contractor shall conduct its own tests or

investigations to satisfy itself as to all transport route conditions, including obstructions, road conditions, weight restrictions, size limitations and utilities. Contractor accepts all risks and contingencies associated with the transport of all equipment and materials for the Work.

- 22.4 Contractor waives its right to any claim against Company for additional compensation or any extension to a date for completion of performance of any part of the Work set out in Exhibit 9 – Work and Milestone Schedule based on, resulting from or arising out of any differences between transport route conditions that may exist and those conditions that may have been assumed or anticipated by Contractor, including resulting from any assumptions, anticipations, misunderstandings or misinterpretation by Contractor of port, bridge or road conditions or from any information provided by Company or Engineer.
- 22.5 Contractor shall bear all costs and charges for special and/or temporary rights which Contractor may require, including those for transport of components of the Work and access to a Site. Contractor shall also obtain, at Contractor's cost, any additional facilities outside a Site which Contractor may require for purposes of Work.
- 22.6 Contractor shall be solely responsible for and assumes all risks associated with the transportation of all Contractor's Personnel to and within the Site, and the cost of such transportation shall be included in the Contract Price.
- 22.7 Subject to **Article 29.1**, Contractor shall be solely responsible for and assumes all risks associated with weather conditions at the Site, and the cost of performing the Work under all weather conditions experienced at the Site shall be included in the Contract Price.

ARTICLE 23 SUBSURFACE CONDITIONS

- 23.1 If, during the course of the Work, Contractor encounters unforeseen geological or geotechnical conditions, including ground water or any other unknown subsurface condition, which it believes may impact upon its ability to complete the Work by the dates specified in Exhibit 9 – Work and Milestone Schedule, Contractor shall immediately provide notice in writing to Engineer, which notice shall contain such information as is reasonably available to Contractor at that time relating to the nature of the unforeseen geological or geotechnical conditions.
- 23.2 Within ten (10) Business days of a notice delivered pursuant to **Article 23.1**, Contractor shall determine the length of the delay resulting solely and directly from the unforeseen geological or geotechnical conditions, if any, and Contractor shall prepare and deliver to Engineer for Acceptance a revised Construction Schedule showing the impact thereof.
- 23.3 Contractor agrees that the Construction Schedule and timing of any Payment Milestone may be adjusted by Engineer to reflect the time by which Contractor is solely and directly delayed or prevented from proceeding with the Work as a result of unforeseen geological or geotechnical conditions.

- 23.4 If Contractor disputes Engineer's decision regarding the delay, it may give a Notice of Dispute respect to the matter and thereafter refer the matter for resolution pursuant to the Dispute resolution procedures in **Article 30**.
- 23.5 Contractor shall at all times use all reasonable efforts and take all reasonable steps as may be required to eliminate or mitigate the impact on the Construction Schedule due to unforeseen geological, groundwater or geotechnical conditions.
- 23.6 To the extent unforeseen geological or geotechnical conditions may constitute a Change, the provisions of **Article 14** shall apply.

ARTICLE 24
DEFAULT AND TERMINATION

- 24.1 The following events shall constitute defaults by Contractor:
- (a) if Contractor does not properly prosecute the Work or fails in the performance or observance of any of its obligations under this Agreement and such failure has a material adverse effect on Company or the Work except to the extent that the failure in performance or observance is excused by reason of Force Majeure; or
 - (b) if any representation or warranty made by Contractor herein or in any certificate, statement or document given pursuant to the terms thereof shall prove to be false or intentionally misleading in any material respect as of the date on which it was made, and any material adverse consequences to Company directly caused thereby shall have not been remedied within five (5) days after Notice thereof shall have been given to Contractor by Company; or
 - (c) if Contractor fails to make prompt payment when due to any Subcontractor or supplier except to the extent that such payments are being contested through mediation, arbitration or litigation; or
 - (d) if Contractor fails to comply with the Applicable Laws and such failure has a material adverse effect on the Work, this Agreement or the interests of Company therein; or
 - (e) if Contractor has made an assignment of this Agreement without the Approval of Company; or
 - (f) if there is an abandonment of the Work or any part thereof; or
 - (g) except in cases of Force Majeure delays, if the Work is discontinued or ceases for a single continuous period of seven (7) days or more, unless contemplated by the Construction Schedule or seasonal interruptions which are customary in the usual and ordinary course of the construction of the Work or without the prior Approval of Company (not to be unreasonably withheld); or
 - (h) if there is an adverse departure from the Technical Requirements; or

- (i) if Contractor consents to an appointment of or the taking of possession by a receiver, trustee, custodian or liquidator of itself or of a substantial part of its property, or fails or admits in writing its inability to pay its debts generally as they become due or makes a general assignment for the benefit of creditors; or
 - (j) if Contractor files a petition in bankruptcy or seeks reorganization and a proceeding under any applicable bankruptcy or insolvency law (as may now or hereafter come into effect) or seeks relief by voluntary petition under the provisions of any existing or future bankruptcy or insolvency or other laws providing for the liquidation, reorganization or winding-up of corporations or form of agreement of extension or adjustment with its creditors; or
 - (k) except as stated in **Article 24.1(j)**, if Contractor has a substantial part of its properties made subject to the appointment of a receiver, trustee, liquidator or custodian by court order and such order shall remain in effect for more than five (5) days or Contractor is declared bankrupt or insolvent or has any property sequestered by a court order and such order shall remain in undisputed effect for a period of more than fourteen (14) days; or
 - (l) Contractor fails to procure or maintain the Performance Bond or Labour and Material Payment Bond in accordance with **Article 7**.
- 24.2 In the event of a default by Contractor (other than a default as described in **Articles 24.1(i), 24.1(j), 24.1(k)** and **24.1(l)** or another default which Company considers may cause irreparable harm to any member of Company Group or the LCP), Company shall give a Notice of the default to Contractor and the surety. Contractor shall remedy the default to the satisfaction of Company within fourteen (14) days of receipt of such Notice or, if such default cannot reasonably be remedied within such fourteen (14) day period, Contractor shall promptly begin to remedy the default within the fourteen (14) day period and thereafter diligently prosecute to conclusion all acts necessary to remedy the default. For greater certainty, "irreparable harm" in this **Article 24** means harm which cannot be compensated by monetary damages.
- 24.3 On the occurrence of a default by Contractor as described in **Articles 24.1(i), 24.1(j), 24.1(k)** and **24.1(l)** or another default which Company reasonably considers may cause irreparable harm to any member of Company Group or to the LCP, Company may elect to terminate this Agreement and, if Company so elects, shall give Contractor two (2) days' Notice of such termination. Contractor shall have no right to dispute the termination. On such termination Contractor shall cease all Work.
- 24.4 If Contractor fails to remedy a default, in accordance with **Article 24.2**, Company shall have the right, at its election, to exercise any or all of the following remedies:
- (a) terminate in whole or in part, the rights or obligations of Contractor under this Agreement;

- (b) take possession of the Work and Worksites and, subject to **Article 24.8**, finish the Work by whatever method Company deems expedient;
 - (c) remedy or cause to be remedied the default;
 - (d) require the surety to perform under the Performance Bond for the Construction Period or the Labour and Material Payment Bond;
 - (e) require the performance of the Work to be stopped (in whole or in part); and
 - (f) bring any proceedings in the nature of specific performance, injunction, or other equitable remedy, it being acknowledged that damages at law may be an inadequate remedy for default by Contractor under this Agreement.
- 24.5 This Agreement shall not be construed as limiting Company's rights or remedies at law or in equity and any such rights or remedies of Company whether at law or in equity or under this Agreement:
- (a) may be exercised individually or together with any one or more of its other rights or remedies and as often or in such order as Company deems expedient; and
 - (b) are cumulative and are in addition to and not in substitution for any other rights and remedies.
- 24.6 All costs of Company relating to or arising out of the lawful exercise by Company of any of its remedies:
- (a) shall constitute a debt by Contractor to Company which shall immediately become due and payable;
 - (b) shall bear interest at the three (3) month Treasury Bill rate, as published by the Bank of Canada for the period in question, until payment is made;
 - (c) may be deducted by Company from the Contract Price; and
 - (d) failing payment by Contractor, shall be paid by the surety or sureties under the Bonds.
- 24.7 Notwithstanding anything to the contrary contained in this Agreement, if in the reasonable opinion of Company there is a real or apprehended danger of material injury or damage to Persons, property or the environment arising out of or in connection with any matter, state, condition or thing relating to the Work, whether as a result of a breach by Contractor of this Agreement or otherwise, Company may, without notice and without prejudice to other remedies (but without obligation to do so), rectify any such matter, state, condition or thing, in which event Contractor shall be responsible for all costs incurred by Company in connection therewith. Company shall forthwith advise Contractor of any action Company takes in reliance on this **Article 24.7**.

- 24.8 Where Company has, pursuant to **Article 24.3** or **Article 24.5(a)** terminated the rights or obligations of Contractor under this Agreement, Company shall, within thirty (30) days of the termination, advise Contractor as to whether or not Company shall complete or cause the Work to be completed. If Company elects to complete or cause the Work to be completed, Company shall use reasonable efforts to ensure that the Work is completed in a cost efficient and timely manner and shall cause the Work to be completed in accordance with this Agreement.
- 24.9 If Company elects to complete the Work (or cause the Work to be completed), Company is not obliged to pay Contractor for any Work in connection with the completion of the Work until the date of Final Completion, in which event the amount to be paid to Contractor will be the Contract Price for such Work less:
- (a) one hundred ten percent (110%) of the costs of completing the Work actually incurred by Company; and
 - (b) any amounts previously paid to Contractor on account of Work performed.
- 24.10 Company shall, as soon as practicable after the date of Final Completion, determine the total costs incurred and accrued in completing the Work including additional overhead and reasonable legal fees on a solicitor-client basis. If the total costs incurred by Company in completing the Work in accordance with the terms of this Agreement exceed the balance of the Contract Price unpaid at the time of delivery of the Default Notice, then Contractor shall be responsible and shall forthwith pay to Company the amount of such excess costs.
- 24.11 Notwithstanding any other provision of this Agreement, Company may in its sole and absolute discretion and for any reason, including convenience of Company and without any fault or default on the part of Contractor, terminate this Agreement effective immediately upon giving Notice to the Contractor or effective at a future date specified in the Notice.
- 24.12 If Company terminates this Agreement pursuant to **Article 24.11** or pursuant to **Articles 24.3** or **24.4(a)** and Company elects not to complete the Work, Contractor is not entitled to further payment for any of the Work; provided however, Contractor is entitled to any amounts payable on account of Work it performed and to retain any amounts previously paid to Contractor on account of Work it performed and, for termination pursuant to **Article 24.11** only, to payment of demobilization costs and any third party cancellation costs.
- 24.13 Where Company has terminated the rights and obligations of Contractor under this Agreement, Contractor shall:
- (a) stop the performance of all Work and services hereunder except as may be necessary to carry out such termination;
 - (b) assign to Company, upon Company's request, all rights of Contractor under such of the Subcontracts entered into by Contractor in connection with this Agreement as Company may specify;

- (c) terminate all Subcontracts as Company may specify in writing;
- (d) provide to Company a detailed list of all tangible and intangible property relating in any way to the Work including all equipment, machinery, fixtures, supplies, designs, concepts, plans, drawings, specifications, schedules, models, samples, patents, technology leases, licenses, books and records;
- (e) be deemed to have granted to Company for Company purposes a non-exclusive, perpetual license or other right to use any and all intellectual property, subject to the terms and conditions set forth in **Article 36.3**;
- (f) deliver or cause to be delivered to Company executed copies of all Subcontracts and related agreements to which it is a party, and shall use its best efforts to deliver or cause to be delivered copies of all documents and agreements relating to the Work which are in the possession or control of any Subcontractors;
- (g) deliver or cause to be delivered record drawings for the portion of the Work which has been completed to that date;
- (h) remove from the Site all material, debris, equipment and supplies that have not been incorporated in the Work and that are designated in writing by Company to be so removed;
- (i) do all such acts, execute and deliver to Company all such documents, conveyances, deeds, assignments, transfers, bills of sale, assurances and certificates and take all actions as may be required by Company to exercise its rights hereunder;
- (j) quit the Site;
- (k) surrender possession and control of the Site and the Work and deliver to Company or its nominee the Work (except those owned by third parties) free and clear of any and all security interests;
- (l) provide Company with such evidence or assurances as Company may reasonably require that title to the Work is unencumbered, and indemnify Company in connection therewith as provided for in **Article 21**, including an indemnification for any outstanding actions, suits or proceedings;
- (m) remove and dispose of such of the Work as is designated in writing by Company to be so removed and decommission or mothball the Work as reasonably required by Company; and
- (n) take any other action towards termination of the Work which Company shall request in writing.

24.14 Company and Contractor each agree that, upon the request of the other, it will do all such acts and execute all such further documents, conveyances, deeds, assignments, transfers,

assurances, certificates and the like as may be necessary or desirable to effect the purpose of this **Article 24**, whether before or after this Agreement is terminated.

- 24.15 To the extent Contractor does not perform its obligations under **Articles 36.3, 24.13** or **24.14**, Contractor hereby irrevocably nominates, constitutes and appoints Company as Contractor's true and lawful attorney in fact and agent for, in the name of and on behalf of Contractor to execute and deliver all such assignments, transfers, deeds, instruments, conveyances and other documents as may be necessary to give effect to the provisions of **Articles 36.3** and this **Article 24**, as the case may be. Such appointment and power of attorney, being coupled with an interest, shall not be revoked by the dissolution, winding-up, bankruptcy, insolvency or subsequently in the capacity of Contractor, and Contractor hereby ratifies and confirms and agrees to ratify and confirm all that Company may lawfully do or cause to be done by virtue of the provision hereof.

ARTICLE 25 SUBSTANTIAL AND FINAL COMPLETION

- 25.1 Substantial Completion shall have occurred if and only if all of the items in paragraphs (a) to (h), inclusive, of this **Article 25.1** have occurred to the satisfaction of Engineer in accordance with this Agreement.
- (a) The Work is ready for use or is being used for the purpose intended and is capable of achieving Final Completion at a cost of not more than two percent (2%) of the Contract Price.
 - (b) Contractor has delivered to Engineer all documents required in Exhibit 4 – Supplier Document Requirements List.
 - (c) Engineer has prepared and delivered an updated Punch List to Contractor, which includes any minor items with respect to which Engineer has notified Contractor are incomplete or which have Defects.
 - (d) Contractor has delivered to Engineer a certificate:
 - (i) detailing all outstanding Claims of Contractor under this Agreement with documentation sufficient in the opinion of Engineer to support such Claims, and Company shall not be liable to Contractor for any Claim under this Agreement which is not identified within that Notice and supported by sufficient documentation; or
 - (ii) certifying that there are no such outstanding Claims.
 - (e) Contractor has delivered to Engineer the latest available clearance certificate from the WHSCC that no assessments or other amounts are owing to the date therein specified.
 - (f) Contractor has removed all Contractor's Items, Contractor's Personnel, supplies,

equipment, materials, rubbish and temporary facilities, except those reasonably required for completion of outstanding Punch List items, from the Worksite so that the Worksite is neat, clean and safe.

- (g) Contractor shall have assigned to Company all representations, warranties, guarantees and obligations which Contractor received from Subcontractors, manufacturers or suppliers subject to Contractor's right to retain the benefit of all Subcontractors that Contractor requires to complete the Work.
 - (h) There being no liens filed or registered pursuant to the *Mechanics' Lien Act*, R.S.N.L. 1990, c.M-3 with respect to or arising from the Work at that time.
- 25.2 When Contractor believes the requirements of Substantial Completion have been met, Contractor shall request from Engineer a Substantial Completion Certificate. Such request shall contain a declaration by Contractor that all the requirements of Substantial Completion have been met and a report of the results of any required tests for the Work with sufficient detail to enable Engineer to determine whether Substantial Completion has been achieved. If all requirements of Substantial Completion have been met to the satisfaction of Engineer, the date of Substantial Completion shall be the later of (i) the date specified in Contractor's request, and (ii) the date when the requirements of Substantial Completion were met to the satisfaction of Engineer. Promptly after Substantial Completion has been achieved as provided above, Engineer shall issue a Substantial Completion Certificate to Contractor, which states the date of Substantial Completion and Contractor shall turn over control and operation of the Work to Company.
- 25.3 Within forty-five (45) days of the date of Substantial Completion, Company shall pay Contractor three quarters of the holdback retained by Company pursuant to **Article 12.16**, provided that:
- (a) if applicable, the appropriate time period stipulated in the *Mechanics' Lien Act*, R.S.N.L. 1990, c.M-3 has lapsed; and
 - (b) Contractor delivers a certificate of one of its senior officers that all accounts for all Subcontracts and all other indebtedness which may have been incurred by Contractor in connection with the Work have been paid in full (except for amounts properly retained as a holdback or as an identified amount in dispute); and
 - (c) Contractor delivers a certificate that its Subcontractors have paid or discharged their obligations in connection with the performance of the Work referred to in the certificate which certificate shall have attached thereto such releases and waivers of liens which are in the possession of the Subcontractors as may reasonably be requested by Company in order to establish such payment or discharge; provided however that if a Subcontractor is unable to provide a certificate that a lien has been discharged, such Subcontractor or Contractor shall furnish a bond or other instrument acceptable to Company to indemnify Company against any such lien claim; and provided further that if any such lien claim remains unsatisfied after all

payments are made, Contractor shall refund to Company all monies that Company may be compelled to pay in discharging such lien including reasonable legal fees on a solicitor-client basis; and

- (d) there shall exist no event of default, or an event which, with the passage of time or the giving of notice or both would constitute an event of default as described in **Article 24**; and
 - (e) Contractor has delivered to Engineer evidence satisfactory to Engineer that Contractor and all Subcontractors engaged in the Work are then assessed with the WHSCC and that their respective accounts are current.
- 25.4 If any item of Work on the Punch List is not completed by the date specified on the Punch List for such item, Company may complete or employ others to complete the item and Contractor shall be liable for and pay Company all costs to complete such item, plus ten percent (10%), and Company may deduct such amount from any amount otherwise owing to Contractor, without affecting any Warranty.
- 25.5 Contractor's access to and continued presence at the Worksite after the date of Substantial Completion shall be for the sole purpose of achieving Final Completion. In performing such work Contractor will use its best efforts not to inconvenience or interfere with Company and Company's Other Contractors.
- 25.6 Final Completion of the Work shall have occurred if and only if all of the following have occurred to the satisfaction of Engineer in accordance with this Agreement:
- (a) Substantial Completion shall have occurred and a Certificate of Substantial Completion has been issued;
 - (b) all other outstanding obligations of Contractor under this Agreement have been fulfilled;
 - (c) Contractor shall have delivered the warranties from Subcontractors as referred to in **Article 17**;
 - (d) Contractor shall have delivered to Engineer electronic copies and reproducible hard copies of the record drawings for the Work; and
 - (e) all Punch List items have been remedied to the satisfaction of Engineer.
- 25.7 When Contractor believes the requirements of Final Completion have been satisfied, Contractor shall request by Notice a Final Completion Certificate. Such Notice shall contain a declaration by Contractor that all the requirements of Final Completion have been met. If all requirements of Final Completion have been met to the satisfaction of Engineer, the date of Final Completion shall be the later of (i) the date specified in Contractor's request, and (ii) the date when the requirements of Final Completion were met to the satisfaction of Engineer. Promptly after Final Completion has been achieved as provided above, Company

shall issue a Final Completion Certificate to Contractor, which states the date of Final Completion.

- 25.8 By submission of the Notice to Company for confirmation that Contractor has fully performed all of the Work pursuant to **Article 25.7**, Contractor agrees that, as of the date of the issuance of the Notice, Contractor waives, remises, releases and discharges Company of any and all Claims as of the date of the Notice that are known, ought to have been known or discoverable by reasonable means by Contractor, which Contractor has or may have relating to or arising out of this Agreement and the subject matter of this Agreement, and all facts and circumstances related to the Work, save and except:
- (a) any Claims previously submitted in writing prior to the date of the Notice, and remaining unresolved; and
 - (b) the balance of the Contract Price payable, if any, upon the issuance of the Final Completion Certificate.
- 25.9 A Final Completion Certificate shall not be conclusive evidence of the value of the Work or that the Work is in accordance with the Agreement or that the Contractor has performed all its obligations under the Agreement:
- (a) to the extent that fraud or dishonesty relates to or affects any matter dealt with in the Notice of Final Completion; or
 - (b) to the extent that any latent Defect is discovered.
- 25.10 Within thirty (30) days following issuance of a Final Completion Certificate, Company shall pay the balance of the Contract Price for the Work, including the balance of the holdback retained by Company pursuant to the *Mechanics' Lien Act*, R.S.N.L. 1990, c.M-3, less:
- (a) an amount to satisfy any liens registered against the property of Company arising out of Contractor Group's performance of the Work;
 - (b) any amount Company is entitled to set off against payment to Contractor;
 - (c) any amount payable to Company pursuant to the provisions of this Agreement; and
 - (d) any amounts required or permitted to be withheld by Company by Applicable Laws or this Agreement.

ARTICLE 26 LIQUIDATED DAMAGES

- 26.1 For each Milestone specified in Exhibit 2 – Compensation as being subject to liquidated damages, if Contractor fails to deliver that part of the Work to achieve the Milestone by the date specified, Contractor shall pay Company as liquidated damages the full amount stipulated in Exhibit 2 – Compensation for each day, including any part thereof, of the delay

of that Milestone, from the date the delay commenced to the date the Milestone is achieved, unless the failure to achieve the Milestone is due to an event of Force Majeure. Contractor's limit of liability for liquidated damages payable by Contractor to Company pursuant to this **Article 26.1** shall be a maximum of twenty percent (20%) of the Contract Price.

- 26.2 Contractor acknowledges that Company's damages for which Contractor is responsible as determined in accordance with **Article 26.1** are difficult to ascertain, and that the remedies of Company described therein are fair and reasonable in the circumstances, and Contractor agrees that it will not challenge the validity of any such remedies in any legal proceedings or otherwise claim or assert that any such remedies are invalid or unenforceable. Contractor agrees that Company may plead this **Article 26.2** in any legal proceedings as an estoppel and complete answer in defence to any challenge, claim or assertion. For clarification, **Articles 26.1** and **26.2** shall not be construed as restricting the rights or remedies of Company:
- (a) with respect to the exercise by Company of any remedy otherwise available under this Agreement or at law; or
 - (b) in respect of any Claim by Company that a breach of this Agreement by Contractor has occurred; or
 - (c) as to the amount or value of any damages incurred or suffered by Company as a result of any breach by Contractor.
- 26.3 Company shall have the right to payment by Contractor of liquidated damages from time to time by giving Notice to Contractor. Any such Notice shall specify the amount of such damages and Contractor shall pay the amount so specified within ten (10) Business Days of the date of such Notice. Failure by Company to give Contractor a Notice shall not constitute a waiver of Company's right to claim all liquidated damages under this **Article 26**.
- 26.4 Company has the right to set off any amount of liquidated damages, plus interest determined in accordance with **Article 12.19**, owed by Contractor to Company against any amount due or to become due from Company to Contractor under the Agreement.

ARTICLE 27 TITLE AND RISK

- 27.1 Contractor warrants good title to all Contractor's Items, consumables, goods and other items furnished by it under this Agreement and that they are free from any liens or encumbrances in favour of third parties. Risk of, and in, Contractor's Items shall remain with Contractor throughout the Term.
- 27.2 Title to the Work (or any part of the Work) performed, including all Contractor's documentation related to the Work, shall vest in Company as and when performed or prepared. Title to all equipment, materials and products to be supplied by Contractor or its

Subcontractors for incorporation into the Work shall vest in Company as and when identified and designated for incorporation into the Work. Title to any items free issued to Contractor by Company shall always remain vested in Company.

- 27.3 Company shall have the right, without prejudice to any other right it may have under the Agreement, to decline to pay for any part of the Work if Contractor is unable to provide evidence reasonably satisfactory to Company that title to the same has passed to Contractor or shall pass unconditionally to Company as provided in the Agreement, free from any liens or encumbrances in favour of any third parties.
- 27.4 Contractor shall cause the inclusion of terms consistent with the terms of **Articles 27.1, 27.2** and **27.3** in all Subcontracts so that Company and Contractor shall have the rights herein set forth with respect to each Subcontractor involved in the performance of the Work.
- 27.5 Subject to **Article 17**, risk of and in the Work shall be assumed by Company upon issuance of a Substantial Completion Certificate, and Contractor shall assume the risk of and undertake the care and control of the Work until such time as the Substantial Completion Certificate is issued in accordance with **Article 25.2**.
- 27.6 Contractor shall make available to Company all data relating to the operation and performance of the Work in electronic media for use by Company during the Term and during the operation of the Work. Contractor shall undertake all reasonable efforts to ensure data is provided in a form fully useable to Company with well recognized industry standard applications, including the requirements of Exhibit 3 - Coordination Procedures and Exhibit 11 - Company Supplied Documents.
- 27.7 Company, at its discretion and upon Notice to Contractor, may take possession of or use Work, and/or any part of the Work, at any time prior to Substantial Completion of such Work. If Company takes possession of or uses the Work following such Notice:
- (a) Company shall not be deemed to have Approved the Work or that part possessed or used;
 - (b) the Warranty shall apply except that the Warranty shall commence upon use of that part of the Work to which the Notice applies, notwithstanding the time for commencement in **Article 17.1**, and continue for the duration specified in **Article 17**;
 - (c) risk of loss of such Work shall pass from Contractor to Company upon such possession or use of such Work by Company;
 - (d) Company shall be responsible for all statutory occupational health and safety obligations accruing after such taking of possession, for and in relation to such Work;
 - (e) the provisions of **Article 14** shall apply only to the extent such possession or use of such Work constitutes a Change; and

- (f) except as set out in this **Article 27.7**, Contractor shall not be relieved of its responsibilities and obligations under this Agreement.

ARTICLE 28 SUSPENSION

- 28.1 Company may at any time during the Term, at Company's sole discretion for any reason, suspend performance of the Work, or any part thereof, by giving Notice to Contractor (such period of suspension hereinafter "**Suspension Period**"). The Work shall be resumed by Contractor on a date as may be specified by Company in a Notice to Contractor. During the Suspension Period, Contractor shall properly protect and secure the Work as Approved in advance by Company.
- 28.2 Subject to **Article 28.3** and **Article 28.4**, Company shall reimburse Contractor its reasonable expenses (which Contractor shall use its best efforts to mitigate) incurred in compliance with any suspension order and associated reinstatement order (the "**Suspension Expenses**"). Any such Suspension Expenses are to be subject to audit in accordance with **Article 16**. In no event shall Contractor be entitled to any compensation for indirect or consequential losses, including lost profits and revenue, that may have resulted from such suspension or reinstatement order.
- 28.3 Company shall have the right to suspend performance of the Work for as long as necessary to prevent or stop any contravention of **Article 15**. During such period of suspension, no Suspension Expenses shall be payable to Contractor by Company.
- 28.4 In case of suspension due to Contractor's failure to perform the Work in accordance with **Article 3**, Contractor shall not be entitled to Suspension Expenses incurred from the moment the Notice of suspension was given until a reinstatement order (if any) is given by Company but shall remain liable, without prejudice to Company's other rights under this Agreement.
- 28.5 Contractor shall cause all terms of this Article to be inserted in all Subcontracts so that Company and Contractor shall have the rights herein set forth with respect to all Subcontractors.
- 28.6 If there is a suspension under **Article 28.1** for greater than ninety (90) days, either consecutively or in the aggregate, Contractor may give Company five (5) Business Days Notice of Contractor's intent to suspend or terminate the Agreement. Company may, by Notice to Contractor, require Contractor to resume the Work within such five (5) Business Day period, in which case this Agreement shall remain in full force and effect. Any further suspension under **Article 28.1** shall entitle Contractor upon Notice to Company, to immediately suspend or terminate this Agreement at its sole discretion, without prejudice to Contractors' right to Suspension Expenses subject to the terms of this **Article 28**. If Company does not require Contractor to resume the Work within such five (5) Business Day period, then this Agreement shall be suspended or terminated (as the case may be as stated in Contractor's Notice) upon the expiry of such period without any further Notice, without

prejudice to Contractor's right to Suspension Expenses subject to the terms of this **Article 28**.

ARTICLE 29
FORCE MAJEURE

29.1 For the purposes of this Agreement, Force Majeure shall mean and be limited to the following:

- (a) acts of God, riot, civil unrest, civil disturbance (including blockades to or from the Site), war, acts of civil or military authority, epidemics, quarantine restrictions, acts of terrorism;
- (b) earthquake, flood, fire, storms in excess of a one hundred (100) year storm or other natural physical disaster, but excluding other weather conditions as such regardless of severity;
- (c) strikes at a national level, industrial disputes at a national level, which affect a substantial or essential portion of the Work;
- (d) a change in Applicable Law or the interpretation thereof (recognized by relevant courts or relevant government authorities) which change could not on the Effective Date reasonably have been foreseen and which affects a substantial or essential portion of the Work; and
- (e) maritime and aviation disasters.

29.2 Neither Contractor nor Company shall be responsible for any failure to fulfil any term or condition of this Agreement if and to the extent that such fulfilment has been delayed or rendered impossible by a Force Majeure occurrence of which the other Party has been notified in accordance with this **Article 29** and which is beyond the control and without the fault or negligence of the Party affected, and which by the exercise of reasonable diligence the said Party is unable to provide against.

29.3 A Party may not rely upon the provisions of **Article 29.2**:

- (a) unless it shall immediately upon being made aware of the Force Majeure occurrence notify the other Party of such Force Majeure and of the obligations expected to be affected thereby;
- (b) unless it shall immediately take all such steps as may be commercially reasonable in the circumstances to cause the discontinuance of, and to minimize the effect of, the Force Majeure occurrence and resume performance of the obligation affected by the Force Majeure as soon as reasonably possible; and
- (c) to the extent that and for so long as there would be concurrent delay to Work resulting from pre-existing matters within the responsibility or obligation of the

Contractor under this Agreement.

- 29.4 Where Company claims Force Majeure and is entitled to rely upon the provisions of **Article 29.2**, then no compensation shall be payable to Contractor during the period that the Force Majeure occurrence continues to prevent performance by Company. Where Contractor claims Force Majeure and is entitled to rely on the provisions of **Article 29.2**, then no compensation shall be payable to Contractor during the period that the Force Majeure occurrence continues to prevent performance by Contractor.
- 29.5 If Contractor is prevented from or delayed in performing any of its obligations as a result of an event of Force Majeure for a cumulative period of more than thirty (30) days or a consecutive period of more than fifteen (15) days during the Term, Company shall have the right thereafter to immediately terminate this Agreement upon giving Notice thereof to Contractor and Company shall have no further liability whatsoever to Contractor (except payment for Work performed prior to such termination).
- 29.6 Where a Force Majeure event occurs and Contractor is entitled to rely on the provisions of **Article 29.2**, then no compensation shall be payable to Contractor during the period that the Force Majeure occurrence continues to prevent performance by Contractor up to a maximum of thirty (30) consecutive days or ninety (90) cumulative days (either of which shall be referred to as the "Initial Force Majeure Period"). Where the Force Majeure occurrence continues beyond the Initial Force Majeure Period, Contractor shall have the right to terminate this Agreement at any time specifying the date that upon five (5) days' Notice to Company termination shall be effective (the "FM Termination Date"), provided that such Notice of termination shall not be effective if Company provides Notice to Contractor before the intended FM Termination Date that Contractor is to remain on standby to complete the Work (the "Standby Notice"). If no Standby Notice is provided by Company, this Agreement shall be terminated as of the FM Termination Date and, in such case, Company shall have no further liability whatsoever to Contractor (except for payment for Work performed prior to the FM Termination Date). If Company gives the Standby Notice, then Contractor shall remain available to perform the Work and shall be entitled to a Change Order to the extent the Force Majeure occurrence(s) cause or result in a Change, including without limitation for an extension to the schedule and for all additional costs and expenses incurred by Contractor in relation to the Force Majeure occurrence(s) and to complete the Work (including any cost escalation).
- 29.7 A Force Majeure occurrence shall in no circumstances entitle Contractor to an increase in the Contract Price.
- 29.8 During any period in which the performance of the Work is prevented because of Force Majeure, Contractor and Company shall mutually agree either (1) to continue maintaining Contractor's Items and Personnel at or near the Worksite, in which case Company will reimburse Contractor at the rates outlined in Exhibit 2 - Compensation which is intended to cover only those expenses incurred by Contractor as a direct result of such prevention of performance, or (2) to demobilize Contractor's Items and Personnel.

ARTICLE 30
DISPUTE RESOLUTION

- 30.1 If any dispute, controversy, claim, question or difference of opinion arises between the Parties under this Agreement including an interpretation, enforceability, performance, breach, termination or validity of this Agreement ("**Dispute**"), the Party raising the Dispute shall give Notice to the other Party in writing within thirty (30) days of the Dispute arising, and such Notice shall provide all relevant particulars of the Dispute.
- 30.2 Upon issuance of Notice of Dispute, the Parties shall, acting in good faith and a commercially reasonable manner, attempt to resolve the Dispute in the following manner:
- (a) Within fifteen (15) days of the Notice, the senior project managers for each of the Company and the Contractor shall meet;
 - (b) If not resolved by senior project managers, the project sponsors or representative Vice Presidents for each of the Company and Contractor shall meet within thirty (30) days following the meeting of the project managers; and
 - (c) If not resolved by project sponsors or representative Vice Presidents, the Chief Executive Officers for each of the Company and Contractor shall meet within thirty (30) days following the meeting of the project sponsors or representative Vice Presidents.
- 30.3 If the Dispute is not resolved by the Parties within ninety (90) days from the date of delivery of the Notice of Dispute then a Party may take whatever action is deemed appropriate pursuant to this Agreement. For greater certainty, the Parties must comply with this **Article 30** before commencing any further action, legal or otherwise, with respect to a Dispute under this Agreement.
- 30.4 Notwithstanding that a matter or matters have been referred to be resolved by application of the Dispute resolution procedures in this **Article 30**, each of Company and Contractor shall, to the extent reasonably possible or unless advised in writing by Company to suspend or discontinue work, continue to perform their obligations under this Agreement without interruption or delay and the continuation of such performance shall in no way amount to a waiver of, or in any way prejudice, positions taken by the Parties in the dispute being arbitrated under this Agreement. There shall be no extension to any date for completion of a Milestone by reason that a matter or matters have been referred to be resolved pursuant to the Dispute resolution procedures in **Article 30**.

ARTICLE 31
LABOUR RELATIONS

- 31.1 Contractor acknowledges that some or all of Company's Other Contractors and their Subcontractors at a Worksite may be union or non-union and that the Company requires Contractor to ensure that labour peace shall be maintained. Contractor shall take all

necessary precautions to avoid labour disputes and to minimize the disruption in the event of any dispute.

- 31.2 Contractor shall at all times promptly take all steps necessary to maintain good labour relations with Contractor Personnel to the extent that such requirement is consistent with sound business practice in accordance with the Standard of a Prudent Contractor. Subject to **Article 29.1(c)**, the existence of any labour disturbance relating to Contractor Personnel shall not relieve Contractor of its obligations under this Agreement.
- 31.3 Contractor represents and warrants that no collective or other agreement with its Personnel or between its Subcontractors and their workers, and no expiry or termination of any such agreement, will adversely affect labour peace at the Worksites or delay the Contractor's performance of the Work.
- 31.4 Contractor represents and warrants that it and its Subcontractors, if unionized, have written agreements with the unions representing the workers employed by them that include provisions that non-affiliation rights in any collective agreement or pursuant to any statutory right will not be exercised in connection with the Work. Any and all such agreements shall be submitted to Engineer within five (5) Business Days of the Effective Date or of the date an agreement comes into effect.
- 31.5 Whenever the Contractor has knowledge that any actual or potential labour dispute is delaying or threatening to delay the schedule and performance of the Work, the Contractor shall immediately advise Engineer in writing, including all relevant information with respect to such dispute or potential dispute and potential impact on the schedule and performance of the Work.
- 31.6 Without restricting the generality of Company's right to terminate the Agreement, Company may, but is not obligated to, give Notice to Contractor requiring Contractor to terminate any Subcontract by giving five (5) days Notice to the Subcontractor if:
- (a) the workers of the Subcontractor, or anyone employed by or through the Subcontractor:
 - (i) declare or engage in a strike, a work stoppage or a refusal to supply material; or
 - (ii) engage in a slowdown or other concerted activity which restricts or limits or, is likely to restrict or limit, the progress or performance of the Work;
 - (iii) picket or cause picketing to occur or support picketing by the refusal to Work, or continue to Work at or in the Worksites whether in support of lawful strike or for any other reason; or
 - (iv) do not comply with **Article 2.14**.
 - (b) the Subcontractor, or anyone engaged by or through the Subcontractor, imposes a

lockout, lawful or unlawful, against their workers engaged in performing the Work.

- 31.7 Contractor shall ensure that all Subcontracts allow termination in each of the events set out in **Article 31.6**.
- 31.8 The sole cost and expense of preventing, avoiding or removing any of the matters or events giving rise to a labour disruption with respect to the Work shall be borne by Contractor, who shall prevent, avoid and remove any and all such labour disruptions within five (5) days of the commencement of such disruptions, including making any necessary applications for injunctive or other relief to the Court.
- 31.9 Except for strikes, labour disputes or industrial disputes referenced in **Article 29.1(c)**, delays in the performance of the Work as a result of any strike, industrial dispute, labour disruption or labour dispute are to be considered as a delay attributable to Contractor, and for which the Contractor shall not be entitled to compensation or an extension to the date for completion of a Milestone.

ARTICLE 32 CONFIDENTIALITY

- 32.1 The term "**Confidential Information**" shall mean all information and data, in whatever form, which Company provides to Contractor in connection with this Agreement (including events witnessed by Contractor Group in connection with the performance of the Work). Confidential Information does not include information which:
- (a) prior to the time of disclosure or acquisition is lawfully in the public domain;
 - (b) after disclosure or acquisition becomes part of the public domain, through no act or omission on the part of a Party;
 - (c) prior to disclosure or acquisition was already lawfully in a Party's possession without limitation on disclosure to others;
 - (d) was obtained by a Party from a third party who is lawfully in possession of such information and is not subject to a contractual or fiduciary relationship with the other Party with respect to such information; or
 - (e) was independently developed by the receiving Party without the use of Confidential Information.
- 32.2 Contractor shall not disclose Confidential Information (including photographs of activities of Company) to any third party nor use any Confidential Information without the Approval of Company. Notwithstanding the foregoing, Contractor may disclose Company's Confidential Information if required by Applicable Laws. Contractor shall promptly notify Company in advance of any such intended disclosure. Contractor shall adopt and follow precautionary measures with respect to Confidential Information to ensure that it is not disclosed to third parties by any of Contractor Group, without the Approval of Company. Any Approval given

by Company shall apply only to the specific request for Approval made by Contractor.

- 32.3 Company may disclose information received by Contractor to Company's Affiliates, Engineer and the directors, officers, employees, contractors, subcontractors, legal counsel, consultants and advisors of the foregoing to whom disclosure is required to enable the Company to perform its obligations hereunder or to any other Person if such disclosure is required by Applicable Laws, provided Company has taken such reasonable and necessary precautions to prevent any of the foregoing parties from disclosing such information to any third party. Company may disclose such necessary Contractor's information to Company's bankers and to financial institutions from whom Company may seek financing for the LCP.
- 32.4 To the extent Company is subject to the provisions of the Privacy Law, all documents and other records in the custody of or under the control of the Company and its Affiliates, and in relation to the Work in the custody of or under the control of Contractor, will be subject to the Privacy Law. Contractor acknowledges that Company is subject to the access to information and Privacy Law pursuant to which the public may have access to Company's records.
- 32.5 If Contractor discloses Confidential Information to its Personnel, Contractor shall ensure that any such Personnel are informed of the confidential nature of the information disclosed and that such Personnel comply with the Contractor's obligations under this **Article 32**.
- 32.6 This **Article 32** does not apply to the disclosure of Confidential Information by Contractor in order to comply with any Applicable Law or legally binding order of any Court or Authority, as long as prior to such disclosure Contractor gives Notice to Company with full particulars of the proposed disclosure.
- 32.7 Subject to Contractor retaining one (1) copy for backup purposes, if requested by Company, whether prior to or after the expiry or earlier termination of the Agreement, Contractor shall promptly deliver to Company all Confidential Information provided by Company that is in the custody, possession or control of Contractor or any of its Personnel.
- 32.8 The breach of any of the conditions contained in this **Article 32** will be deemed to be a material breach of the Agreement.

ARTICLE 33

GENERAL

- 33.1 Nothing in this Agreement, nor the conduct of a Party, shall in any manner whatsoever constitute or be intended to constitute Contractor as the agent or representative or fiduciary of Company or any of its Affiliates, nor constitute or be intended to constitute a partnership or joint venture between Company and Contractor or any other Party, but rather as between Company and Contractor each Party shall be severally responsible, liable and accountable for its own obligations under this Agreement or otherwise for any conduct arising therefrom and for all Claims, demands, actions and causes of action arising directly

or indirectly therefrom. Neither Party shall have the authority to make nor shall it make any statements, representations or commitments of any kind, or take any action, that will bind the other Party, except as expressly provided in this Agreement or as otherwise authorized in writing by the applicable Party.

- 33.2 Contractor shall, for all purposes under this Agreement and in relation to any aspect of the performance of its obligations in respect of the Work, be an independent contractor and shall have responsibility for and control over the details and means of performing such obligations in accordance with the terms and conditions of this Agreement. Contractor's Personnel shall not be employees of Company. Contractor's Personnel shall be under the direct supervision and control of Contractor and not of Company. Contractor accepts complete responsibility as the principal for Contractor's Personnel.
- 33.3 Contractor agrees and shall cause the Subcontractors to agree at all times to highlight the independent nature of the relationship between Company and Contractor wherever possible, including through the use of on-site signage and identifiable logo, letterhead, colour schemes and equipment identification.
- 33.4 Each of the Parties shall, from time to time, at its own cost and expense, execute or cause to be executed all such further documents and do or cause to be done all things which are necessary to give effect to the provisions of this Agreement.
- 33.5 This Agreement embodies the entire agreement between Contractor and Company with respect to the Work and comprises all matters relating to the planning, procurement, construction, testing, inspection, commissioning and completion of the Work. Unless otherwise expressly stated, this Agreement supersedes all prior agreements, understandings or writings between the Parties, whether written or oral and whether legally enforceable or not. Subject to Applicable Laws, no Party shall be bound by or be liable for any statement, representation, promise, warranty, inducement, agreement, obligation or understanding of any kind or nature not set forth in this Agreement.
- 33.6 No modification of this Agreement by Contractor or Company, either before or after the execution of this Agreement, shall be of any force or effect unless such modification is in writing, is expressly stated to be a modification of this Agreement and is signed by duly authorized representatives of each of the Parties, with the exception of the following Exhibits where modifications to same may be issued solely by Company (in which case the provisions of **Article 14** shall apply to the extent the modification constitutes a Change):
- (a) Exhibit 3 – Coordination Procedures;
 - (b) Exhibit 5 – Health and Safety Requirements;
 - (c) Exhibit 6 – Environment and Regulatory Compliance Requirements;
 - (d) Exhibit 11 – Company Supplied Documents;
 - (e) Exhibit 12 – Site Conditions;

- (f) Exhibit 13 – Provincial Benefits.
- 33.7 Contractor agrees that all public relation matters arising out of or in connection with the Work shall be the sole responsibility of Company. Contractor shall obtain Company's Approval of the text of any announcement, publication or other type of communication concerning the Work.
- 33.8 Contractor shall not advertise or issue any information, publication, document or article (including photographs or film) for publication or media releases or other publicity relating to the Work, the Agreement, the LCP or Company's business and activities without Approval of Company except as may be required by Applicable Law. Contractor shall refer to Company any enquiries from the media concerning the Work, the Agreement, the LCP or Company's business and activities. Contractor shall include in each Subcontract a provision that incorporates the terms of **Article 33.7** and this **Article 33.8** such that those terms shall apply to each Subcontractor.
- 33.9 This Agreement shall be binding upon and shall enure to the benefit of the Parties hereto and their respective successors and permitted assignees.
- 33.10 The following provisions of this Agreement shall survive the termination or expiration of this Agreement and remain in full force and effect: **Articles 1.11, 1.12, 1.14, 1.15, 1.19, 3.7, 5.1, 5.7, 5.8, 6.11, Article 7, 10.7, 12.15, Article 13, Article 17, Article 21, Article 24, Article 25, Article 32, 33.8, 33.9, 35.1, 35.2 and Article 39.**

ARTICLE 34 ASSIGNMENT

- 34.1 Company may, without the Approval of the Contractor, assign this Agreement, or any part thereof, to:
- (a) any Affiliate of Company; or
 - (b) any successor to or replacement corporation of Company, or similar entity in connection with any merger, consolidation or other reorganization of Company or transfer of all or any part of Company's assets; or
 - (c) any Lender;

and upon Notice by Company to Contractor of such assignment, Company shall be fully and finally released and discharged from all liabilities, obligations, any and all actions, causes of action and covenants, whether expressed or implied, Claims or demands for damages, sums due, indemnity, costs (including legal fees and disbursements), expenses, interest, loss or injury of every nature and kind whatsoever and howsoever arising, which Contractor may heretofore have had, may now have, or may hereinafter have, in any way relating to or under this Agreement, both past and future, and Contractor acknowledges and agrees that the assignee shall thereupon be the sole obligor for all past and any future obligations under this Agreement in the same manner and to the same extent as if it was the sole obligor and original party hereto

in the place and stead of Company under this Agreement, the whole without any further action, Approval, notice or document being taken, obtained, sent or executed by or to any of the Parties at any time.

- 34.2 In the event of an assignment pursuant to Article 34.1(c) above, Contractor agrees that:
- (a) prior to the exercise by Contractor of any rights it may have under the Agreement arising by reason of any breach by Company of the Agreement (any such breach, a "**Breach**"), including cancellation or suspension of the Contractor's performance thereunder, Contractor shall give to the Agent Party at such time, written notice of the Breach at the time such notice is provided to Company. Upon receipt of such notice, such Agent Party shall be entitled, but shall in no way be obligated, to cure or cause to be cured such Breach and curable breaches which arose prior to such notice within sixty (60) days following the receipt by such Agent Party of such notice ("**Cure Period**"), provided that:
 - (i) such Cure Period will automatically be extended for the period of time the Contractor is precluded by Applicable Laws or by virtue of any debt reorganization, insolvency or bankruptcy proceedings, from cancelling the Contract; and
 - (ii) during the Cure Period, Contractor will not be obligated to supply goods or services or otherwise perform prospective obligations under the Agreement unless Contractor receives immediate payment for such goods, services or obligations;
 - (b) it shall not exercise any rights of cancellation or suspension under the Agreement before the expiry of the Cure Period, unless the Agent Party at such time, expressly notifies the Contractor in writing that such Agent Party shall not:
 - (i) cure or cause to be cured the Breach specified in the relevant notice if such Breach is of a curable nature, or
 - (ii) observe and perform the obligations of Company under the Agreement, including curing curable breaches which arose prior to such notice.
- 34.3 Company shall not assign this Agreement or any of its benefits or obligations thereunder to any third party, other than those described in **Article 34.1**, without Contractor's Approval, which Approval shall not be unreasonably withheld, conditioned or delayed.
- 34.4 Following any assignment by Company pursuant to this **Article 34**, this Agreement may be re-assigned to Company without Contractor's Approval.
- 34.5 Contractor shall not assign any of its interest in this Agreement without the Approval of Company. Such Approval shall not release or relieve Contractor from any representation or warranty given by Contractor or any obligation to be performed on the part of Contractor under this Agreement. Notwithstanding the foregoing, Contractor may at any time assign

its interest in this Agreement to an Affiliate, provided that:

- (a) Contractor shall remain liable for any obligation to be performed on the part of Contractor under this Agreement, including Performance Guarantees, if such Affiliate fails to fulfill any such obligation;
- (b) Performance Bond and Labour and Material Payment Bond shall remain in place, remain effective and available to Company in the event the Affiliate fails to fulfill the Contractor's obligation under this Agreement; and
- (c) if the Affiliate has a tax residency status that is different than the tax residency status of Contractor as declared to Company in accordance with **Article 13.3** (or such subsequent tax residency Approved by Company), Contractor has obtained the prior written approval of Company of the proposed assignment to the Affiliate.

34.6 In the event of a transfer by sale, assignment, amalgamation, merger, trust, operation of law or otherwise of any shares, interest or voting rights of Contractor which may result in the change of identity of the Person exercising *de facto* or *de jure* control over Contractor, the provisions of **Article 34.5** shall apply.

ARTICLE 35 LIENS AND CLAIMS

- 35.1 Without prejudice to the provisions of this **Article 35**, Contractor shall prevent the imposition of any liens, claims, encumbrances or attachments by or on behalf of any third party against Contractor's Items, the Work, and Company property wherever located, or any portion thereof and any liens or attachments which nevertheless are imposed shall be promptly vacated and removed from title by Contractor, at Contractor's sole cost, and Contractor shall indemnify, defend and hold Company Group harmless from and against the same.
- 35.2 Contractor shall defend, protect, release, indemnify and hold Company Group harmless from and against, and shall keep Contractor's Items, Company's property, Site and Work thereon free and clear of all liens, charges, claims, assessments, fines and levies suffered, created, or committed by Contractor Group, save only liens or encumbrances created with the prior written consent of Company voluntarily in favour of financial organizations in connection with Contractor's obtaining reasonable, prudent and necessary financing. Company may post on any of Contractor's property such notices as it may desire to protect itself against such liens, claims, assessments, fines and levies.
- 35.3 Notwithstanding the efforts of Contractor hereunder, if Company suffers costs or expenses or becomes liable for payment as a result of the imposition of such liens or attachments, then without prejudice to any other rights or remedies available to Company, Company shall have the right to withhold and set off an amount equal to any such costs, expenses or payments incurred or made by Company from any payments due to Contractor hereunder.

ARTICLE 36
CONTRACTOR'S DOCUMENTS AND INTELLECTUAL PROPERTY

- 36.1 Contractor, on or before the time set forth herein, shall prepare and deliver to Engineer all documents listed in Exhibit 4 – Supplier Document Requirements List.
- 36.2 Contractor shall provide Engineer, without charge or cost, copies of all documents required by this Agreement whether obtained by or prepared by or on behalf of Contractor.
- 36.3 (a) All plans, specifications and other documents conceived of or produced or caused to be prepared, conceived of or produced and delivered in the performance of this Agreement by or on behalf of Contractor ("**Intellectual Property**") and which are particular to the Work shall be the property of Company.
- (b) Subject as is hereinafter provided, Contractor hereby grants to Company the exclusive, perpetual license or other right to use all such Intellectual Property and all patents, copyrights and other industrial and intellectual property rights, including trade secrets, arising in relation to the Intellectual Property ("**Rights**"), if any, that are held by Contractor. Contractor also agrees to obtain a non-exclusive, perpetual licence or other right to use such Intellectual Property and Rights from any other Persons who hold any rights and interests in the Intellectual Property and Rights and agrees to assign to Company the right to use all such Intellectual Property and Rights for all purposes in relation to the LCP.
- (c) Contractor shall execute any and all written documentation which Company, Engineer and/or Lender may require to evidence the grant and assignment of the Rights.
- (d) Contractor shall not be liable in any manner whatsoever for Claims arising as a result of the use by Company or Engineer of the Intellectual Property or Rights other than in connection with the LCP.

ARTICLE 37
SHOP DRAWINGS

- 37.1 Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures, product and other data (including data in electronic form) which Contractor provides to illustrate details of a portion of the Work.
- 37.2 Shop Drawings shall be based on the design drawings and specifications set out in Exhibit 1 – Scope of Work.
- 37.3 Contractor will provide Shop Drawings as described in the Agreement or as Engineer may reasonably request.
- 37.4 Contractor will review all Shop Drawings prior to submission to Engineer. Contractor represents by this review that Contractor has determined and verified all field

measurements and field construction conditions, product requirements, catalogue numbers and similar data and that Contractor has checked and coordinated each Shop Drawing with the requirements of the Work and of the Agreement. Contractor will confirm this review of each Shop Drawing by stamp, date and signature of the person responsible. At the time of submission Contractor will notify Engineer in writing of any deviations in the Shop Drawings from the requirements of the Agreement.

- 37.5 Contractor will submit Shop Drawings to Engineer to review in orderly sequence and sufficiently in advance so as to cause no delay in the Work or in the work of Company's Other Contractors. Upon request of Engineer, Contractor and Engineer will jointly prepare a schedule of the dates for submission and return of Shop Drawings. Any Shop Drawings which require Approval of any Authority will be submitted to such Authority by Contractor for Approval.
- 37.6 Contractor will submit Shop Drawings in the form specified in the Agreement or as Engineer may direct. Engineer will review and return Shop Drawings in accordance with the schedule agreed upon or otherwise with reasonable promptness. Engineer's review is for conformity to the design concept and for general arrangement only. Engineer's review will not relieve Contractor of responsibility for errors or omissions in any Shop Drawing submitted by Contractor or for meeting all requirements of the Agreement unless Engineer expressly notes the Acceptance of a deviation on the Shop Drawings.
- 37.7 Upon Engineer's request, Contractor will revise and resubmit Shop Drawings which Engineer rejects as inconsistent with the Agreement unless otherwise directed by Engineer. Contractor will notify Engineer in writing of any revisions to the resubmission other than those requested by Engineer. Contractor will not be entitled to any extension to the dates for completion of a Milestone nor any adjustment to the Contract Price as a result of complying with its obligations to resubmit Shop Drawings under this paragraph.

ARTICLE 38 APPROVAL OF EQUIPMENT

- 38.1 For equipment types identified in Exhibit 1 – Scope of Work, Contractor shall provide Engineer with a detailed list of the equipment that the Contractor proposes to use in the performance of the Work. The list of equipment provided by Contractor shall include manufacturer, model and a summary specification for each item listed.
- 38.2 Contractor shall not use any type of equipment required to be listed in accordance with **Article 38.1** unless the specific equipment has been Accepted by Engineer. If Contractor seeks to use different equipment from that listed and Accepted by Engineer, Contractor shall notify Engineer and provide Engineer with such information as Engineer may require.
- 38.3 Engineer may, on reasonable grounds, object to any item of equipment proposed by Contractor in the equipment list. If each alternative make, manufacturer or model is rejected by Company for any item, type or class of equipment set out in the proposed list of equipment then Contractor shall resubmit the proposed list of equipment with further

alternatives for the rejected item, type or class of equipment.

ARTICLE 39
NOTICES

- 39.1 Unless otherwise specified in the Agreement, any Notice given or made pursuant to the Agreement shall:
- (a) be in writing;
 - (b) be marked to the attention of the Contractor's Project Manager , in the care of the Contractor, or to the Company Representative, in the case of the Company;
 - (c) where given by Company, be signed or authorized by either Company Representative, an officer, a director or company secretary of Company, or a duly authorized representative of Company;
 - (d) where given by the Contractor, be signed or authorized by either Project Manager, an officer, a director or company secretary of the Contractor, or a duly authorized representative of the Contractor; and
 - (e) be delivered by prepaid post, by hand, by Aconex or by facsimile to the Party to whom the Notice is addressed at its address specified in **Article 39.3** or such other address as that Party may have notified to the other Party.
- 39.2 A Notice will be taken to be duly given:
- (a) in the case of delivery by hand, when delivered;
 - (b) in the case of delivery by post, five (5) Business Days after the date of posting (if posted to an address in the same country) or twenty (20) Business Days after the date of posting (if posted to an address in another country);
 - (c) in the case of delivery by facsimile, on receipt by the sender of a transmission control report from the sending machine showing the relevant number of pages and the correct destination facsimile machine number or name of the recipient and indicating that the transmission has been made without error;
 - (d) in the case of delivery by Aconex, at the time and date recorded by Aconex for delivery to the recipient.
- 39.3 Any Notice given or made under the Agreement shall be delivered to the intended recipient by hand, post, Aconex or facsimile to the address or facsimile number below or the address or facsimile number last notified by the intended recipient to the sender:
- (a) to Company:

Labrador-Island Link Limited Partnership
Re: Lower Churchill Project
350 Torbay Road Plaza, Suite No. 2
St. John's, NL
Canada A1A 4E1
Attention: Darren DeBourke, Project Manager-HVdc Specialties & Switchyards
Facsimile No.: 709-754-0787
email: darrendebourke@lowerchurchillproject.ca

(b) to the Contractor:

H.J. O'Connell Construction Limited
90 O'Leary Avenue, 1st Floor
St. John's, NL
A1B 2C7
Attention: Nolan Jenkins, Manager – Engineering & Business Development
Facsimile No.: 709-726-9106
email: njenkins@hjoc.com

- 39.4 Except where Notice is given using Aconex in accordance with **Articles 39.2** and **39.3**, if the Parties use any other form of electronic mail for day to day communication such electronic mail shall not be used for and will not constitute Notice under the Agreement where the Agreement expressly requires that a Notice be given.
- 39.5 Any technical communications pertaining to the Work shall be between Engineer and Contractor's Project Manager. Engineer shall, subject to the terms of this Agreement, be authorized to act on behalf of Company in all technical matters concerning the Work but not to commit or bind Company to a Change or amendment of the Agreement.
- 39.6 Except where expressly provided otherwise in the Agreement, verbal communications will not constitute formal communication or Notice under the Agreement and neither Party has any obligation to act on any verbal communication or instruction unless and until it is confirmed in writing. Any action taken by a Party based on verbal communications, instructions or assurances will be at that Party's sole risk and will be without liability to or recourse against the other Party.
- 39.7 A Party may, from time to time, give Notice to the other Party of any change to its address.

ARTICLE 40 EXECUTION

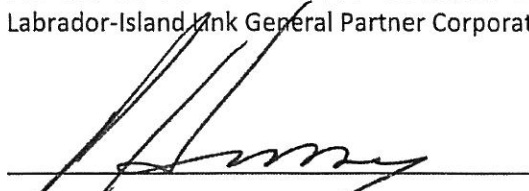
- 40.1 This Agreement may be executed in any number of counterparts and any Party may transmit by facsimile or email in portable document format to the other Party a copy of this Agreement executed by that Party, the receipt of which shall have the same force and effect as if the original thereof had in fact been delivered at the same time.

40.2 Any original, facsimile copy, portable document format or photocopy of this Agreement bearing one or more signatures on behalf of a Party shall be admissible against that Party in any legal proceeding as evidence of the execution and delivery of this Agreement by that Party and without the requirement to produce an executed original of the Agreement.

40.3 Each person signing the Agreement as an authorized representative of a Party hereby represents and warrants that he or she is duly authorized to sign the Agreement for that Party and that the Agreement, upon having been so executed, shall be binding on that Party in accordance with its terms.

EXECUTED AS AN AGREEMENT:

For and on behalf of **LABRADOR-ISLAND LINK LIMITED PARTNERSHIP**, by its general partner Labrador-Island Link General Partner Corporation



Signature of Authorized Representative



Signature of Authorized Representative

RAT HUSSEY

Name of Authorized Representative

Ron Power

Name of Authorized Representative

For and on behalf of **H.J. O'CONNELL CONSTRUCTION LIMITED**



Signature of Authorized Representative



CEO

JIM BRENNAN, PRESIDENT


Name of Authorized Representative
(14176511.5)

EXHIBIT 1

SCOPE OF WORK

This Exhibit 1 - Scope of Work incorporates the following documents:

1. Document List (Doc. No. LCP-SN-CD-4500-EN-LS-0001-01);
2. Scope of Work Specification (Doc. No. LCP-SN-CD-4500-CV-SP-0001-01); and,
3. Engineering Technical Specification (Doc. No. LCP-SN-CD-4500-CV-TS-0001-01).

 SNC • LAVALIN	Construction of Earthwork at New Switchyard at Soldiers Pond		Revision		
	Document List				
	Nalcor Doc. No. LCP-SN-CD-4500-EN-LS-0001-01		C2	Date	Page
SLI Doc. No. 505573-CD0503-40AL-I-0003		01	13-Dec-2013	i	


LOWER CHURCHILL PROJECT


CD0503-002


CONSTRUCTION OF EARTHWORK AT NEW SWITCHYARD AT SOLDIERS POND


DOCUMENT LIST

Prepared by: 
 Rami Wadhwa

Checked by: 
 Tony Villaraza


Approved by: 
 Mohamad Makky

Approved by: 
 Satish Sud

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REVISION LIST

Revision					Remarks
N°	By	Chec.	Appr.	Date	
C2	RW	TV	MM/SS	09-Dec-2013	Issued for Construction
C1	TV/RW	MM	MM/SS	25-Oct-2013	Issued for Acceptance


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	SLI Doc. No. 505573-CD0503-40AL-I-0003		01	10-Dec-2013	1

TECHNICAL SPECIFICATIONS

DOCUMENT NO.	REV.	DOCUMENT TITLE
LCP-SN-CD-4500-CV-SP-0001-01	C2	CD0503-002 Construction of Earthwork at New Switchyard Site at Soldiers Pond - Scope of Work
LCP-SN-CD-4500-CV-TS-0001-01	C2	CD0503-002 General Technical Requirements Earthworks Engineering Technical Specification
LCP-SN-CD-4500-CV-LS-0001-01	C2	CD0503-002 Supplier Document Requirement List (SDRL) Earthworks at Soldiers Pond

DRAWINGS

DOCUMENT NO.	REV.	DOCUMENT TITLE
ILK-SN-CD-4500-CV-PL-0036-01	C2	230 kV Soldiers Pond Switchyard Access Road Plan View (Road A)
ILK-SN-CD-4500-CV-PL-0038-01	C2	230 kV Soldiers Pond Switchyard Access Road Plan View (Road B)
ILK-SN-CD-4500-CV-PL-0039-01	C2	230 kV Soldiers Pond Switchyard Access Road Plan View (Road C, D & E)
ILK-SN-CD-4500-CV-PL-0040-01	C2	230 kV Soldiers Pond Switchyard Access Road Detail Notes
ILK-SN-CD-4500-CV-DD-0007-01	C2	230 kV Soldiers Pond Substation - Access Road TCH Intersection Plan, Profile and Sections
ILK-SN-CD-4500-CV-PL-0006-01	C2	230 kV SP Switchyard and Converter Station Site Grading and Leveling
ILK-SN-CD-4500-CV-PL-0037-01	C3	230 kV SP Substation Site Grading and Leveling
ILK-SN-CD-4500-CV-DD-0001-01	C3	230 kV SP Substation Site Grading and Leveling Details
ILK-SN-CD-4500-CV-SE-0006-01	C2	230 kV SP Substation Substation Earthworks #1 (Sections A-A, B-B, C-C, and D-D)
ILK-SN-CD-4500-CV-PL-0008-01	C2	230 kV SP Substation Earthworks #2 (Sections)
ILK-SN-CD-4500-EV-MP-0001-01	C1	Soldier's Pond Switchyard, Converter Station and Synchronous Condensers Environmental Constraint Map
ILK-SN-CD-4500-CV-PL-0001-01	C3	Soldiers Pond Station - Location Plan - 230kV Switchyard and Converter Substation

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LOWER CHURCHILL PROJECT

CD0503-002

CONSTRUCTION OF EARTHWORKS AT NEW SWITCHYARD SITE AT SOLDIERS POND

SCOPE OF WORK SPECIFICATION

Prepared by:

 Rami Wadhwa/Qi Hu

Verified by:




 Antonio Villaraza/Bruce Colpitts

Approved by:




 Mohamad Makky

Approved by:



 Satish Sud

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N°	By	Verif.	Appr.	Date	
C2	RW/QH	AV/BC	SS/MM	13-Dec-2013	Re-Issued for Construction
C1	RW/QH	AV/BC	SS/MM	06-Nov-2013	Issued for Construction



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1 GENERAL

1.1 Project Description

Phase I of the Lower Churchill Project (LCP) includes the Muskrat Falls generating facility with a capacity of 824 MW, the HVac and HVdc overland transmission lines, the undersea transmission cable, and the associated HVac switchyards and HVdc converter stations. The overland transmission system portion of the LCP consists of: 1,080 km of \pm 350kV HVdc overland transmission line from Muskrat Falls, Labrador to Soldiers Pond, Newfoundland, two (2) 315 kV HVac overhead transmission lines totalling roughly 500km interconnecting the Muskrat Falls facility to the Churchill Falls generating station, two (2) 735 kV HVac interconnection lines approximately 1.2 km each, four (4) 315 kV HVac interconnection lines between Switchyard and Powerhouse approximately .05 km each, and three (3) line re-terminations at Soldiers Pond substation.

1.2 General Description of Package


This Exhibit 1 – Scope of Work identifies the Work required to carry out Site grading and associated Work for a new substation which shall include a 230 kV ac switchyard, a 350 kV HVDC Converter yard and a Synchronous Condenser facility.

1.3 Language and Units

The language to be used for all signage, correspondence, and documentation is English. The units of measurement will be the SI metric system.


1.4 Abbreviations and Definitions

SP	Soldiers Pond
C-SEPP	Contract-Specific Environmental Protection Plan
CF(L)CO	Churchill Falls (Labrador) Corporation
HV-GB	The Municipality of Happy Valley-Goose Bay
HVac	High Voltage, alternating current

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HVdc	High Voltage, direct current
ITP	Inspection and Test Plan
kV	Kilovolt
MF	Muskrat Falls
NE-LCP	Nalcor Energy – Lower Churchill Project
P-WEPP	Project-Wide Environmental Protection Plan
TCH	Trans Canada Highway
TLH	Trans Labrador Highway


1.5 Not Used

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1.6 Location Map



Figure 1-1: Location Map

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2 SCOPE OF WORK


2.1 Work Included

2.1.1 The Work described herein includes the supply of all labour, materials and equipment and the execution of all Work required to perform the site grading and associated civil works as shown on the Drawings and as specified herein or as otherwise required by Engineer.

2.1.2 Whenever reference is made to the Technical Specification, reference is made to document No. LCP-SN-CD-4500-CV-SP-0001-01 included in Exhibit 1 - Scope of Work.

2.1.3 The Work includes, but is not limited to, all of the following:


1. Surveying required for the establishment of the bench marks will be the responsibility of Company prior to the commencement of Work. Contractor shall implement the Work using these benchmarks, as well as confirm all surveys and layouts prior to excavation and subgrade base course construction.
2. Surveying required for establishing Work advancement.
3. Design, construction, maintenance, displacement, if required, and dismantlement of temporary construction roads, access ramps and Work areas necessary for the execution of the Work.
4. Design, construction, maintenance, displacement, if required, and dismantlement of temporary construction roads to borrow pits, stockpile and spoil disposal areas as specified in this Specification.
5. Grubbing and clearing inside the footprint of the switchyards, Site facility areas, ditches, trenches, borrow pits and roads, if required, as specified in the Technical Specifications.
6. Exploitation of borrow pits, Contractor's laydown area and stockpile areas, including treatment and transportation of materials and rehabilitation of these areas as specified in Technical Specification Section 31 15 00 – Sources of Materials.

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7. Design, supply, installation, operation, maintenance, and dismantlement, where required, of all dewatering systems needed to execute draining of the North-East pond on the proposed Site and the excavation and embankments in the dry conditions, as specified in Technical Specification Section 31 23 19 – Dewatering.
8. Construction, maintenance and operation of all surface water control systems including ditches, containment dams, pumps and hoses required in conjunction with sedimentation ponds, as shown on the Drawings (refer to Document List document No. LCP-SN-CD-4500-EN-LS-0001-01 included in Exhibit 1 – Scope of Work) and specified in Exhibit 6 – Environmental and Regulatory Compliance Requirements.
9. Construction, operation and maintenance of sedimentation ponds with associated trenches and pumping systems.
10. Construction maintenance and operation of all temporary mitigation measures to comply with Exhibit 6 – Environmental and Regulatory Compliance Requirements.
11. Explosives and blasting (if required).
12. Work areas and Site rehabilitation at the end of the Work.
13. Supply and install project signs.
14. Design and construction of permanent access roads.
15. Site preparation, including access, of Site facility construction office areas for Company's Other Contractors.
16. Draining of the North-East pond on the proposed Site at Soldiers Pond.

3 SITE SPECIFIC CONSIDERATIONS

The Earthwork for Soldiers Pond Site is identified in the Drawings, refer to document No. LCP-SN-CD-4500-EN-LS-0001-01, "Document List" of Exhibit 1 – Scope of Work, which identifies the orientation, fence dimension, incoming lines, proposed access road and the layout of the station infrastructure.

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3.1 Not Used

3.2 Not Used

3.3 Soldiers Pond Site Grading Concept

Contractor shall be responsible for clearing of the Site as shown on Drawings. The Site preparation Work at Soldiers Pond includes the construction of a new design/build access road and construction of Earthwork for a new substation. Sizes of the new substation shall be as shown on Drawings. Contractor shall use the existing access road for the Work as specified and build new access to the new substation.

The location of proposed laydown areas for stockpiling of suitable material and spoils may change to suit the Site conditions. Contractor shall prepare the laydown/spoil areas with access in accordance with the P-WEPP and submit the proposal to Engineer for review and Acceptance.

The substation yard shall be built to the subgrade elevations as shown on Drawings. It is intended to develop the switchyard Site with balanced cut/fill concept, with the entire substation at one level using the suitable excavated material.

Contractor shall prepare Site facility areas for the future contract CD0501, CD0502 and CD0534 as shown on the Drawings.

Size of the Site facility areas may change to provide the required area. Preparation of the Site facility area shall include clearing, grubbing and placement of compacted common backfill topped with 50 mm of grade 2 maintenance gravel. The elevation of the finished yard shall be 300 mm (min.) higher than the surrounding grounds.


3.4 Construction Power

Electrical power for construction shall be provided by Contractor.

4 WORK EXCLUDED

The following work is excluded from this Agreement:

1. Legal surveys for switchyards, including detection for underground facilities.

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2. Permit applications for access road entrances from Highways.
3. Switchyards insulating gravel and chain link fence.

5 GEOTECHNICAL INFORMATION

Geotechnical information for the Site shall be found in document No. LCP-AM-CD-8000-GT-RP-0001-01, "Geotechnical Investigations, Various Substations" included in Exhibit 11 - Company Supplied Documents.

6 SPECIAL REQUIREMENTS

6.1 Health and Safety Requirements

Refer to Exhibit 5- Health and Safety Requirements.

6.2 Quality Requirements

Refer to Exhibit 7 – Quality Requirements.

7 WORK SITE CONDITIONS


Contractor shall be responsible to provide an office trailer for Engineer in accordance document No. LCP-SN-CD-4500-CV-TS-0001-01 CD0503-002 – General Technical Requirements Earthworks Soldiers Pond Engineering Technical Specification Section 1.1, Engineer Field Office included in this Exhibit 1 – Scope of Work.

8 ENVIRONMENTAL REQUIREMENT

Refer to Exhibit 6 – Environmental and Regulatory Compliance Requirements.

9 INTERFACES

Contractor shall be responsible for compliance to all Applicable Laws, and all other applicable standards and codes including environmental regulations. A portion of the switchyard Work is to be carried out adjacent to existing energized 230 kV transmission line.

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10 ARCHEOLOGICAL FINDINGS

Any fossils, coins, articles of value or antiquity and monuments and other remains or things of geological or archaeological interest discovered at a Site shall, as between Company and Contractor, be deemed to be the absolute property of Company. Contractor shall take reasonable precautions to prevent persons from removing such archaeological findings, notify Engineer of such discovery and abide by Engineer's instructions regarding the discovery.

11 SUBMITTAL REQUIREMENTS

Refer to Exhibit 4 – Suppliers Document Requirements List (SDRL).

12 COMPANY SUPPLIED DOCUMENTS

Contractor shall refer to Exhibit 11 - Company Supplied Documents

13 REFERENCE DOCUMENTS

The reference documents for this Exhibit 1 – Scope of Work are found in document No. LCP-SN-CD-4500-EN-LS-0001-01 included in Exhibit 1 – Scope of Work and Exhibit 11 –Company Supplied Documents.

14 SCHEDULE / MILESTONE

Refer to Exhibit 9 – Work and Milestone Schedule.

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LOWER CHURCHILL PROJECT

CD0503-002

GENERAL TECHNICAL REQUIREMENTS EARTHWORKS – SOLDIERS POND ENGINEERING TECHNICAL SPECIFICATION

PROVINCE OF NEWFOUNDLAND AND LABRADOR

PEGNL
Newfoundland and Labrador
PROFESSIONAL ENGINEERS AND GEOSCIENTISTS

PERMIT HOLDER
This Permit Allows
SNC-LAVALIN INC.

AMV 27 Jan 14
Prepared by:

To practice Professional Geoscience in Newfoundland and Labrador. Permit No. as issued by PEGNL N0458 which is valid for the year 2014

Checked by:

Antonio Villaraza

Antonio Villaraza

Bruce Colpitts

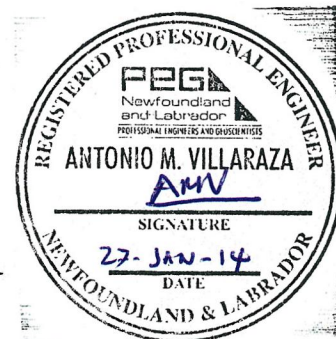
Bruce Colpitts

Approved by: *Mohamad Makky*

Mohamad Makky

Approved by: *Satish Sud*

Satish Sud



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Revision						Remarks
N°	By	Chec.	Appr.	Appr.	Date	
C2	AV	BC	SS	MM	13-Jan-2014	Re-Issued for Construction
C1	RW/QH	AV	SS	--	28-Oct-2013	Issued for Construction

 SNC • LAVALIN	GENERAL TECHNICAL REQUIREMENTS Earthworks – Soldiers Pond Engineering Technical Specification		Revision		
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SECTION 31 10 00
 General Requirements


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1. GENERAL

1.1 Engineer Field Office


Contractor shall supply a furnished field office on the Site for the use of Engineer’s personnel. The field office and furniture shall be of a standard not less than that shown and described in Drawing, “Field Office Plan” attached in this Technical Specification. Should Contractor wish to supply an office with furniture other than that shown and described on this plan, then prior written Acceptance from Engineer must first be obtained before a substitution may be used.

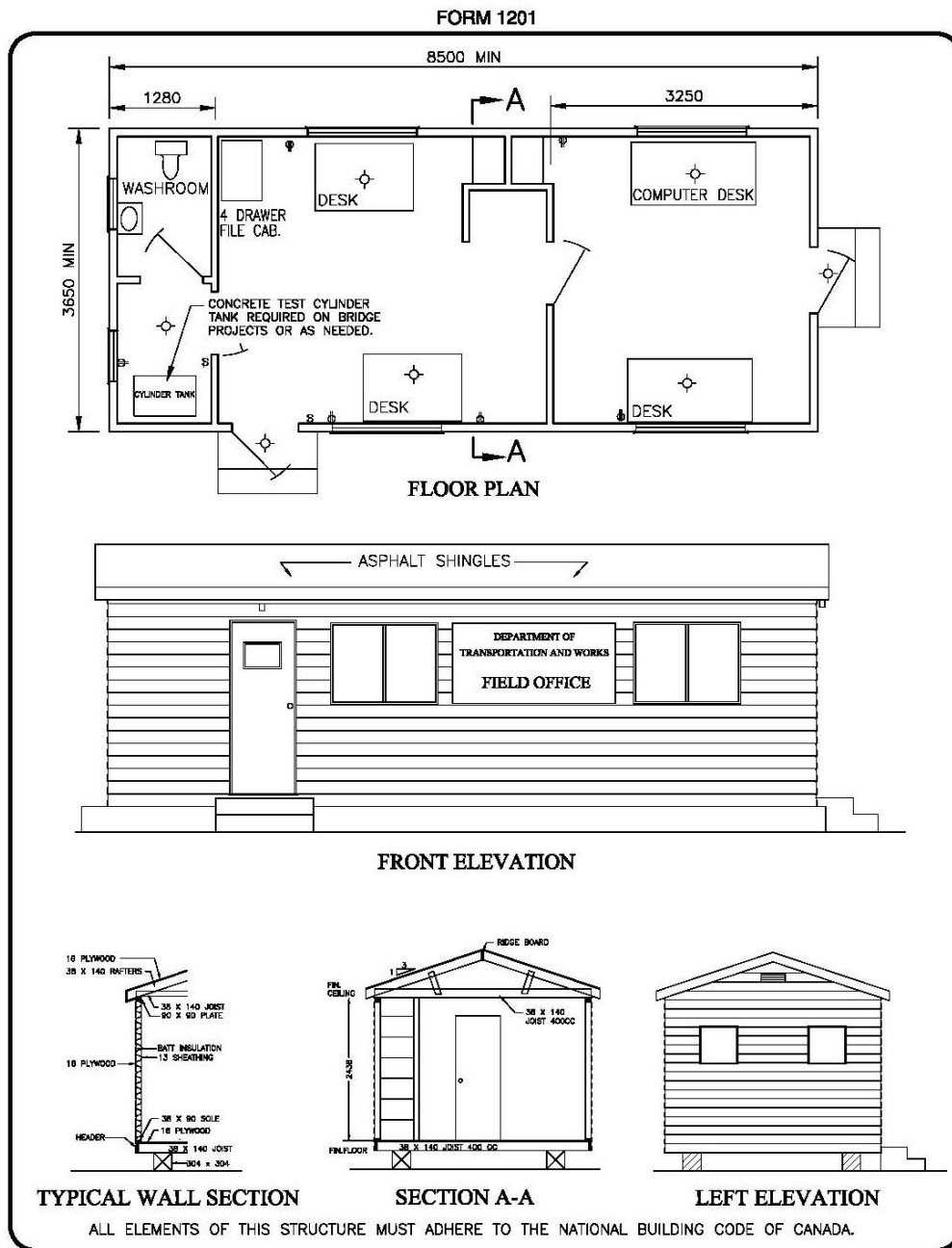
The field office is to have a provision for fax, photocopier and scanning. The copier must be capable of copying bound field books. Field office shall be prewired for internet services. Company will provide its own internet services.


The field office must be located near the switchyard construction or at Contractor campsite if Contractor chooses to have a camp, and shall be ready for use from the first day Contractor commences work. It shall remain available for use for the duration of the Agreement. All doors for accessing Engineer’s field office shall be secured by means of an exterior latch suitable for an Engineer supplied padlock. Any other means of accessing the field office shall be securable and accessible from the inside only.

Contractor shall periodically clean the office and maintain all electric lights, heating, hot and cold water, and the water-closet in good working condition at all times.

All costs of providing the office, furniture, and equipment and providing and maintaining the required heat, light, hot and cold water, and sanitary provisions together with periodic clean out shall be borne by Contractor. No separate payment will be made for this item. The provision and maintenance of the field office shall be included in the Contract Price.


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 TRANSPORTATION AND WORKS HIGHWAY DESIGN DIVISION	FIELD OFFICE	
DRAWN BY:	DATE: 02-01-10	NOT TO SCALE

MARCH 2011

1201 -1

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1.2 Sanitary Provisions

Contractor shall provide and maintain sanitary provisions for the use of its employees. The sanitary provisions shall be in accordance with the various Provincial Government and Municipal Government Regulations.

1.3 Purchase of Lumber

Whenever Contractor is required to purchase lumber for use on this Agreement, lumber that has been manufactured in the Province of Newfoundland and Labrador must be used when such lumber is available in suitable quality.

1.4 Movement of Contractor's Plant

Whenever it becomes necessary to transport Contractor's plant, machinery or materials, Contractor shall have no claim against Engineer and Company for any cost or delay that may be incurred or occasioned by reason of the condition of any road, bridge, or any natural obstruction.


1.5 Lines and Grades

Contractor shall set alignment, grades and slopestakes as per Drawings and as required by Engineer.

Contractor shall be responsible for survey and layout.

Contractor shall perform original ground cross-sections, as well as monthly surveys for progress measurement and compute quantities for the various classifications of excavation. Cross-sections taken in winter shall only be taken after all snow is cleared from the area to be cross sectioned. All original cross-sections and monthly surveys shall be provided to Engineer upon request.

Contractor will verify, from time to time, the grades and alignment during the progress of the Work and provide reports to Engineer for review.

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Contractor may submit a written request for an alignment or grade revision. Any request must be Accepted by Engineer prior to the revision being made in the field.

1.6 Storage Facilities

Contractor shall supply proper storage facilities at its own expense and shall be responsible for the care of all materials until placed in the Work.

1.7 Protection against Negligence and Damage


Contractor shall at all times carry on the Work in a manner that will create the least interference with traffic consistent with the faithful performance of the Work. Contractor shall not close any portion of the access road, except by written order of Engineer. When such closure is so authorized, Contractor shall furnish, erect, and maintain at its own expense, such barriers, lights, and notices, and employ such security and flag persons as Engineer may direct. Contractor shall use all proper precautions by good and efficient barriers, notices, lights, and security, for the prevention of accidents. Contractor shall assume all damage liability to persons or properties caused by reason of its operations on this Agreement.

1.8 Removal of Snow and Ice

During the construction period, Contractor shall remove snow and ice from any portion of the work in any of its stages.

1.9 Finishing of Product

After all other Work under the Agreement is completed, and before acceptance and final payment will be made, the entire Site shall be neatly finished and trimmed to the lines, grades, and cross sections shown on the plans, or as directed by Engineer, to produce smooth surfaces and slopes and a uniform cross section. All construction operations related debris, fallen trees, boulders, bog, and surplus materials, shall be stockpiled as required by these Technical requirements.

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Rehabilitation of the existing ground disturbed due to excavation for the yards and the access road shall be carried out by Contractor as per the Technical Specifications.

All drainage ditches, waterways, and culverts shall be opened up and cleared out to restore same to their full effectiveness.

Should the surface of any existing facility or road be contaminated as a result of Contractor's operations, then Contractor shall clean off all such mud, or deleterious substances, and restore the surface to the satisfaction of Engineer.

All grubbed areas adjoining excavations or embankments shall be graded to comply with the general ground lines.

Finishing in accordance with this Paragraph 1.9, forms part of this Work and no separate payment for finishing will be granted.


1.10 Weight Restrictions

Contractor shall be responsible for the compliance with the Department of Transportation and Works weight restrictions by both its own vehicles and any hired trucks hauling materials for use on this Agreement.

1.11 Dewatering Incidental to Work

The term "Dewatering" shall mean the removal or keeping water out of the Site in order for work to be carried out in accordance with the Specifications.

Dewatering is not a separate pay item, but forms part of and is required in order to carry-out the Work. Such necessary dewatering shall be provided by Contractor. Contractor shall provide temporary equipment such as pumps and associated materials required for dewatering. Prior to Final Completion, Contractor shall remove the dewatering facilities, clean-up and trim the Site in accordance with Paragraph 1.9 of this Specification.

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Should silt fences be required in connection with dewatering, then the silt fences shall be included in the cost of dewatering.

1.12 Additional Drawings

Company may furnish additional Drawings for clarification. These Drawings have the same meaning and intent as if they were included with Drawings referred to in the Agreement.

1.13 Working Near High Voltage Electrical Facilities

Contractor shall be responsible for ensuring that all Contractor's Personnel working near high voltage transmission lines execute such work in full compliance with all applicable Federal and Provincial Statutes, regulations and codes and Company's Electrical Safety program as detailed in Exhibit 11 – Company Supplied Documents.

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SECTION 31 11 00
CLEARING AND GRUBBING



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1 GENERAL

1.1 Work

Work described in this section includes the supply of all labour, materials and equipment, as well as the execution of all the Work required to carry out the clearing and grubbing in accordance with Exhibit 1, “Scope of Work”, as shown on the drawings, and as specified herein, or as required by Engineer.

1.2 Related Sections

- 1 Section 31 15 00 – Sources of Materials
- 2 Exhibit 11 - Project-Wide Environmental Protection Plan for Components 3 and 4a


1.3 Definitions

Topsoil - Topsoil is the upper outermost layer of soil, usually the top 51 mm to 200 mm, but may be more or may be less. It has the highest concentration of organic matter and microorganisms and is where most of the Earth’s biological soil activity occurs.

Clearing - consists of cutting to within 150 mm or less of the ground, brush, non-merchantable timber, and debris removal, and the cutting, removal, and stockpiling of merchantable timber within the area shown on drawings or as otherwise directed by Engineer.

Grubbing - consists of removal and disposal of all stumps, roots, surface boulders, embedded logs, debris, matted roots, Topsoil, brush, timber and other vegetation from areas designated to be grubbed or as directed by Engineer. Grubbing and stripping shall be conducted to a depth of 400 mm below the original existing ground (surface of topsoil) or as directed by Engineer. Where directed by Engineer, trees, stumps and brush shall be cut to ground level in order not to disturb the organic natural matting. Disposal areas have been identified on Site.

Bog/Muskeg Removal - consists of the removal of all, bog/muskeg and underlying pug material, and other materials not conforming to the requirements for subgrade base course. Bog depths/elevations shall be as specified in document, “Geotechnical Investigation Various Substations” included in Exhibit 11, “Company Supplied Documents”, as shown on the drawings and directed by Engineer on

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Site. All bog shall be removed and disposed of at an approved disposal site. Disposal areas have been identified on Site.

Merchantable Timber - Merchantable timber shall be salvaged as directed by Engineer. Merchantable timber is defined as being 2.5 m or more in length with a top diameter not less than 9.1 cm. Merchantable timber shall be cut into 2.5 – 3.5 m lengths, trimmed, and stored in identifiable stockpile areas on Site, which shall not interfere with natural drainage, and shall not be stockpiled on boggy or wet areas. Merchantable timber shall become property of Contractor.

1.4 Submittals

At least fifteen (15) days prior to the start of clearing and grubbing works, Contractor shall submit for Engineer's Acceptance, a detailed work plan indicating the area's limits, work methods and sequences, the equipment required, as well as the proposed schedule.

2 PRODUCTS

Not Used.

3 EXECUTION

3.1 Clearing Operations


Areas in which clearing is to be carried out shall be staked out on the ground beforehand by Contractor. The areas to be staked will be as per the drawings and as required by Engineer.

All tree branches extending into the right of way which hang within 6 m of the ground shall be cut off close to the trunk in a neat and workmanlike manner.

No trees shall be cut down outside the limits of the area to be cleared, except any tree or trees considered unsafe by Engineer and marked for cutting by Engineer.

No trees, brush or logs shall in any event be piled upon adjacent lands unless authorization is first obtained from Engineer.

Contractor shall dispose of all brush and logs not suitable for salvage.

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Mulching of brush, post tree-harvesting slash, non-merchantable timber, and debris is acceptable method of disposal. However, burning of any material for the purposes of disposal will not be permitted within the contract areas.

3.2 Grubbing

Areas in which grubbing and stripping are to be carried out shall be staked out on the ground beforehand by Contractor.

Surface boulders, smaller than 0.5 m³ (measured as a sphere) shall be considered as part of grubbing, and those larger than 0.5 m³ (measured as a sphere) shall be considered as a rock excavation. All surface boulders shall be removed and disposed of along with the other grubbing debris, except such boulders, which in the opinion of Engineer, can be incorporated in the Work.

Grubbing and bog shall be stockpiled and disposed of respectively in a manner Acceptable to Engineer. Topsoil shall be temporarily stockpiled for later use. Contractor shall dispose of the bog and other unsuitable material offsite as specified in these specifications.

3.3 QA/QC Inspection and Documentation

3.3.1 Processes

The Table 3-1 is a guideline that Contractor shall use during the course of this Work. This table is for easy reference only and is by no means exhaustive. Contractor is not released from the responsibility of ensuring all Work meets the requirements as stipulated in this Technical Specification.



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Table 3-1: Contractor Process Guidelines			
Section	Description	Frequency	Document Type
1.4 SUBMITTALS			
1.4	Contractor shall submit a detailed work plan to Engineer.	At least 15 days before the start of clearing and grubbing works.	Detailed work plan.
3.1 CLEARING OPERATIONS			
3.1	Clearing areas to be staked will be provided by Engineer.	Before the start of work.	Clearing boundary plan.
3.1	No trees, brush or logs shall in any event be piled upon adjacent lands unless authorization is first obtained from Engineer.	Before using adjacent lands.	Authorization.

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SECTION 31 15 00
SOURCES OF MATERIALS



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1 GENERAL

1.1 Work

Not used

1.2 Related Sections

- Section 31 11 00 – Clearing and grubbing
- Section 31 23 19 - Dewatering
- Section 31 23 23 – Subgrade base course construction
- Exhibit 11 – Project-Wide Environmental Protection Plan for Components 3 and 4A

1.3 Definitions


Designated Borrow Area: Shall be identified by Contractor and shall be subject to the Acceptance of Engineer. Potential borrow Sites may be shown on drawings for Contractor’s review. All borrow material required for the Site preparation shall be in compliance with the Technical Specification.

Required Excavations: Common and rock excavations that Contractor shall undertake, inside the limits shown on the drawings, for the construction of the Site preparation.

Weathered Till: A mixture of sand and gravel with some silt, as specified in AMEC’s soil report included in document LCP-AM-CD-8000-GT-RP-0001-01, Exhibit 11, “Geotechnical Investigations, Various Substations). Weathered till material shall be excavated and used with rock fill as specified on Drawings.

Granular Fill Material: A well graded mixture of sand and gravel, and cobbles if permitted, used to build the subgrade base course, as specified in Paragraph 2.1.3, “Granular Fill Materials”, Section 31 23 23 – “Subgrade Base Course Construction” and “Scope of Work Specification (LCP-SN-CD-4500-CV-SP-0001-01)”.

Rockfill: Rock obtained from the required excavations, which meets the Gradation Requirements, specified in Paragraph 2.1.4, Table 2-2 of Section 31 23 23, “Subgrade Base Course Construction”, shall be used for the construction of subgrade base course as specified in Section 31 23 00,

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“Excavation”. Rock material (Rockfill) shall also be used for the construction of roads and slope protection, gabions and ditches.

Common Fill: Material shall be a mixture of sand, silt, clay and gravel obtained during the required excavation of the Site after completing the clearing, grubbing and bog removal.

Fill obtained from the required excavations, which meets the requirements of Section 31 23 23, “Subgrade Base Course Construction”, shall be used for the construction of subgrade base course, Common Fill, as shown on drawings.

Bedding Material: Bedding material and the surrounding fill for culverts, subsurface drain installation shall be in compliance with the NL Department of Transportation and Works specifications, Division 4 Forms 410 and 421.

1.4 Submittals

At least fifteen (15) days before beginning the development of designated borrow areas, stockpile or laydown areas, Contractor shall submit its detailed execution plan for Engineer’s Acceptance, indicating the methods of the development of designated borrow areas, stockpile or laydown areas, responsible technical Personnel, as well as a description of the excavation and processing equipment required, methods and the sequence of exploitation and drainage, as well as the operating schedules.


2 PRODUCTS

2.1 Equipment

The equipment required to carry out the Work shall comply with the Technical Specification requirements. The equipment shall be maintained in good working condition throughout the duration of the Work, be available in sufficient numbers and perform in the manner required to complete the Work in compliance with the Work schedule.

The equipment may include, but is not limited to, the following:

- a) Equipment for the control and drainage of run-off and seepage water
- b) Excavators, backhoes or loaders

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- c) Equipment for separating, screening, crushing and homogenization
- d) Equipment for moisture conditioning (if required)
- e) Equipment for drilling and blasting
- f) Any other equipment necessary to comply with the requirements of this Technical Specification

3 EXECUTION

3.1 Development of Borrow Areas

Contractor shall obtain Engineer's Acceptance to delineate / operate a borrow area. Permitting for borrow areas shall be in accordance with P-WEPP in Exhibit 11 - Company Supplied Documents..


3.2 Stockpile Areas

The surface of any stockpile areas shall be profiled to discharge surface water outside the working area. If necessary, Contractor shall dig ditches and provide and install culverts or drains so as to avoid any water accumulation in and around these areas. Discharge ditches shall direct drainage water to existing vegetation at least 30 m from any watercourse or to sediment ponds/traps.

No ice, snow or material agglomerated by freezing shall be stockpiled. Moreover, the materials shall not be placed on surfaces covered with ice or snow.

In the stockpile areas, the materials shall be placed in layers of not more than 3 m in thickness. Benches shall be left between each layer to avoid material rolling down from the slopes. The materials shall be stacked in such a way as to prevent any water accumulation on their surfaces and erosion of their slopes.

Use of the materials placed in the stockpile areas shall be maximized based on their gradation limits and the gradation specified. This use may include the following activities: selection, crushing, screening and sieving, according to needs. Materials used in the Work shall be handled with equipment and methods that ensure homogenization.

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3.3 Rehabilitation

Contractor shall rehabilitate the borrow pits, the ground adjacent to yard, disturbed due to excavation/blasting and stockpile and spoil disposal areas, unless otherwise indicated by Engineer. Rehabilitation area shall be hydro seeded and work shall be carried out as per the Technical Specifications. On completion of the Work, the slopes of the borrow pits, stockpile and waste disposal areas, shall be sloped at 2H:1V or flatter.

In each borrow pit and stockpile area, the organic soil and the topsoil obtained from grubbing operations shall be spread uniformly over the surface of these areas, unless otherwise indicated by Engineer.

3.4 QA/QC Inspection and Documentation

3.4.1 Processes

Table 3-1 is a guideline that Contractor shall use during the course of this Work. This table is for easy reference only and is by no means exhaustive. Contractor is not released from the responsibility of ensuring all Work meets the requirements as stipulated in this Technical Specification.



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Section	Description	Frequency	Document Type
1.4 SUBMITTALS			
1.4	Contractor shall submit its methods, operating schedules and a description of equipment.	Before the start of the work	Methods and Data Sheets
1.4	Contractor shall submit its operating methods and drainage plan.	At least 15 days before operation	Operation Plan
3.1 DEVELOPMENT OF BORROW AREAS			
3.1	Contractor shall obtain Engineer's Acceptance to operate a borrow area.	Before the start of operations	Approval
3.1	Contractor shall delineate the borrow areas and obtain Engineer's Acceptance for their preparation.	Before the start of preparatory work	Approval

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SECTION 31 23 00

EXCAVATION



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1 GENERAL

1.1 Work

This Section describes the supply of all labour, equipment and materials necessary for rock and common excavation, forming part of the Work, all as shown on the drawings and as specified herein or as required by Engineer.

The Rock and Common Excavation includes, but is not limited to, the following:

- Common excavation
- Open cut excavation of rock
- Controlling surface and ground water and dewatering of the excavations

1.2 Related Sections


- Section 31 23 19 - Dewatering
- Section 31 23 23 – Subgrade Base Course Construction
- Exhibit 11 – Project-Wide Environmental Protection Plan for Components 3 and 4a

1.3 Definitions

Common Excavation: The removal, without use of explosives, of all materials, not defined under Rock Excavation, including debris, frozen or not, overlying bedrock, including individual rock boulders having a volume of 0.5 m³ (calculated as a sphere) or less but excluding snow and ice.

Rock Excavation: The removal of all materials requiring the use of explosives or mechanical rock breaking, with the exception of frozen overburden. Rock Excavation also includes fractured and weathered rock and individual boulders having a volume greater than 0.5 m³ (calculated as a sphere).

Subgrade: Top surface or elevation of fill or backfill immediately below insulating (yard) gravel for switchyards. Subgrade elevation shall be minimum 300 mm above the existing grade, or as directed by Engineer.

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Finished Grade: Top surface or elevation of insulating (yard) gravel for switchyards (By Company's Other Contractors), top surface, or elevation for the access road.

1.4 Regulations

Contractor shall follow all Applicable Laws, including the following:

- Occupational Health and Safety Act, Newfoundland and Labrador
- Explosive Act and regulations
- Transportation of Dangerous Goods Act
- Fisheries Act
- All other applicable requirements as shown in Exhibit 11-Company Supplied Documents

1.5 Submittals

Not used

1.6 Qualifications


Not used

1.7 Safety and Security

Contractor shall comply with all applicable laws and regulations regarding the transport, storage and use of explosives, including warning signals before and after blasting. At least thirty (30) days prior to beginning Rock Excavation, Contractor shall submit for Engineer's Acceptance a detailed plan indicating how it proposes to implement these requirements. This shall include the proposed location of storage for the explosives and detonators, as well as procedures before and after blasting.

Contractor shall maintain all vertical and sloping blasted and excavated surfaces in a safe condition.

During blasting, Contractor shall take all the necessary precautions not to damage directly (fly rocks) or indirectly (vibrations, air blasts), buildings, structures, equipment and transmission facilities located near excavation Work.

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Blasting will only be allowed once all precautions are taken to protect personnel, materials, equipment and other Work. Maximum ground vibration shall be as specified in this section.

Contractor shall scale and remove all loose rock and debris immediately after blasting, which could otherwise endanger personnel, equipment, materials and other work.

Contractor shall keep the Site in clean and proper condition at all times. Contractor shall be responsible for the protection of their equipment and the Work against any damage.

Contractor shall, at regular intervals, inspect the excavated surfaces in excavation and rock and perform all necessary treatment required to ensure their stability and safety at all times.

Contractor shall replace any damaged or inefficient surface protection.

Contractor shall not impose overloads on the final excavated slopes, when using equipment.

Contractor shall install temporary safety fencing, Accepted by Engineer, all around the top of the Rock Excavation and where indicated by Engineer. Fencing posts shall be anchored in the rock mass. If rock is not applicable, Contractor may select alternative bases as supplied by the temporary safety fencing supplier.

Nothing stated in this Technical Specification relieves Contractor of its responsibility concerning safety and security of personnel and equipment or any contractual obligation it may have.

2 PRODUCTS


2.1 Materials

If ANFO (Ammonium Nitrate and Fuel Oil) type bulk explosives are used, Contractor shall comply with Federal and Provincial Standards regarding discharging of Ammonium Nitrates.

2.2 Equipment

Contractor shall provide a description of the drilling equipment that is being proposed for use in the open cut excavation.

Anfomizer or equivalent system shall be used when the use of the ANFO type bulk explosives is allowed.

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3 EXECUTION

3.1 Grubbing

Not used

3.2 Dewatering

All excavation areas shall be dewatered in compliance with the requirements of Section 31 23 19 – “Dewatering”.

3.3 Excavated Materials

Excavated material, which does not comply with the requirements of Section 31 23 23, “Subgrade Base Course Construction”, shall be transported and placed in the spoil disposal area shown on the Drawings. Excavated material and rock, which meet the Technical Specification requirements, shall be transported and placed directly in the subgrade base course or temporarily stockpiled in stockpile areas Accepted by Engineer for subsequent use.

Contractor shall not use excavated materials for its' own purposes without Acceptance of Engineer.

Stockpiling outside of designated areas may only be done with written Acceptance of Engineer.


The surface of the stockpile and spoil disposal areas shall be trimmed to existing ground and grades to provide adequate drainage of the surface. Those areas shall not interfere with the natural drainage of the surrounding area and Contractor shall install culverts or drains to prevent the accumulation of water.

Any material stockpiled temporarily for Contractor’s use shall be removed and transported to the designated stockpiles or spoil disposal areas.

Excavated topsoil shall be disposed of in the stockpile area shown on the drawings or defined on the Site by Engineer.

3.4 Common Excavation

Common Excavation shall be excavated to bedrock or to the excavation limits shown on the Drawings or as required by Engineer.

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When it is required that Common Excavation reaches bedrock, it shall be carried out in such a way that no loose material remains on the rock surface.

The removal of Common Excavation shall precede Rock Excavation by a distance of at least 50 m, except along the bedrock excavation limit where the distance is as shown on the drawings.

All materials lying beyond the excavation limits shown on the drawings or Accepted by Engineer shall be preserved in an undisturbed condition. When required by Engineer, the over-excavated areas shall be backfilled by Contractor using Engineer Accepted materials in compliance with the requirements of Section 31 23 23, "Subgrade Base Course Construction".

The final Common Excavation surfaces shall be Accepted by Engineer.

In order to avoid instability problems, Contractor shall plan its excavation in such a way as to judiciously make use of bedrock topography.

3.5 Rock Excavation

3.5.1 General


Rock Excavation shall be required at Soldiers Pond switchyard Site. Rock Excavation shall be carried out with blasting. Very sensitive existing installations within 300 meters of the blasting Sites include 230 kV wood pole and steel tower transmissions lines and a pond.

Contractor shall use excavation methods which minimize fracturing of the rock beyond the excavation lines in order to obtain smooth, sound and uniform surfaces and to limit over-excavations, giving due consideration to the geological conditions of the rock mass.

3.5.2 Drilling and Blasting Methods

The Rock Excavation shall be performed according to the lines, grades and elevations shown on the Drawings and as required to build the yard to the elevations and grades as shown on drawings.

Excavation shall be carried out according to the sequences, procedures and tolerances shown on the Drawings or as described in this Technical Specification.

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Contractor shall initiate Rock Excavation at the highest level and proceed to progressively lower levels using an integrated sequence of bench blasting and rock stabilization.

All blast holes shall be plugged to prevent their filling by rock debris. Blanket and other measures shall be taken to prevent flying rocks for protection of existing transmission lines nearby. Blasting design shall include prevention of any detrimental effects on spawning beds in the nearby pond(s). Contractor shall include in the bid the procedure and protection measures for blasting as specified.

To avoid confinement, prior to each blast, the muck generated by the previous blasts shall be excavated along the full length and height of the free faces of the bench to be blasted, over a minimum distance of 3 m from the free faces of the bench to be blasted.

At any time, Engineer may request that Contractor change the distribution and quantity of explosives to protect services, areas of ongoing work, and any structures that may be damaged.


All necessary care shall be taken so that accurate positioning and alignment of the holes are achieved. In order to obtain the required accuracy, Contractor shall use adequate survey equipment to set out all controlled perimeter blasting holes, as well as the first two (2) rows of mass excavation holes (buffer holes) adjacent to the controlled perimeter blast holes. The position of each type of blast holes shall be verified by Contractor prior to loading and the results shall be submitted to Engineer.

During excavation Work, Contractor shall undertake surveys to verify the compliance of excavations with that shown on the Drawings. If over-excavations or under-excavations occur, Contractor shall submit to Engineer the excavation surveys and the measures it intends to take to rectify the situation. The removal of under-excavations shall be carried out as excavation proceeds.

3.5.3 Blast Monitoring

Equipment A minimum of two (2) seismographs shall be used for each blast. Engineer shall require that the seismographs be installed at specific locations at Site such as one (1) each at the Wood pole transmission line and Soldiers Pond. Placement of additional seismographs shall be as required by Engineer.

Seismographs shall be calibrated at regular intervals, as recommended by the manufacturer. All calibration certificates shall be submitted to Engineer for review.

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Limits Contractor shall design the blasting mat, adjust the explosive charge by delay, as well as the total explosive charge in such a way that the Peak Particle Velocity (PPV), measured at the surface of rock or, in its absence, soil does not exceed the following limits:

At the nearest wood pole foundation from the blast: 100 mm/s
 (Location to vary during blasting along existing 230 kV transmission line)

At the nearest steel tower foundation from the blast: 240 mm/s
 (Location to vary during blasting along existing 230 kV transmission line)

Soldiers Pond 13 mm/s

3.5.4 Cleaning of Rock Surface

Contractor shall clean excavated surface on a systematic basis for inspection by Engineer. Cleaning shall be with compressed air varying between 350 and 700 kPa, or as Accepted by Engineer, to minimize the potential fly rock during blasting operations.

3.6 QA/QC Inspection and Documentation

3.6.1 Processes

Table 3-1 is a guideline Contractor shall use during the course of this excavation work. This table is for easy reference only and is by no means exhaustive. Contractor is not released from the responsibility of ensuring all work meets the requirements as stipulated in this Technical Specification.




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Table 3-1: Contractor Process Guidelines			
Section	Description	Frequency	Document Type
1.7 SAFETY AND SECURITY			
1.7	Detailed plans for storage of explosives and procedures before and after blasting	At least 15 days before the beginning of work	Plans and methods
3.3 EXCAVATED MATERIALS			
3.3	Contractor shall request Engineer's Acceptance to use excavated materials for its own use	Before work begins	Approval
3.3	Contractor shall obtain Engineer's written Acceptance before using non designated area for stockpiling	Before using non designated area for stockpiling.	Approval
3.4 COMMON EXCAVATION			
3.4	Detailed plans showing methods, sequences of excavation and information on equipment and materials	At least 15 days before the beginning of work	Plans, methods and data sheets
3.4	Contractor shall submit excavation surveys in digital format to establish over or under excavation	Prior to excavation and during excavation work	Report
3.4	Contractor shall submit detailed drawings showing the limits of Common Excavation	Prior to starting Common Excavation	Plans
3.4	Contractor shall submit plans showing methods and excavation limits	Before excavation of frozen Common Fill	Plans and methods

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Section	Description	Frequency	Document Type
3.5 ROCK EXCAVATION			
3.5	Seismographs data sheets and calibration certificates	At least 15 days before excavation	Data sheets and calibration certificates
3.5	Contractor shall submit detailed drilling and blasting plan	At least 24 hours before the beginning of work	Plans
3.5.2	Appropriate method of excavation of boulders greater than 0.5 m ³ shall be Accepted by Engineer.	Before excavation	Method
3.5.2	Contractor shall submit excavation surveys in digital format to establish over or under excavation.	Prior to excavation and during excavation work	Report
3.5.3	Seismograph calibration certificates shall be submitted to Engineer.	As recommended by manufacturers	Calibration certificates

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SECTION 31 23 19

DEWATERING



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1 GENERAL

1.1 Work


This Section describes the supply of all labour, equipment and materials necessary for the dewatering of permanent and temporary open cut excavations, work areas including draining/dewatering of the pond located on the North-East corner, borrow pits, stockpile and laydown areas, in compliance with the Drawings, P-WEPP and as specified herein or as required by Engineer, all forming part of the Work.

Dewatering includes interception, removal, pumping extraction and treatment of all water, including surface and seepage infiltrations, artesian water flow and lowering of the water table.

The dewatering systems shall permit the execution of Work related to all excavations and construction in the dry and shall ensure the stability of excavated slopes and prevent the erosion of materials during the Term.

The dewatering work includes, but is not limited to, the following:

1. Design, supply, transport, installation, operation, maintenance, relocation if required, dismantling if required, of all dewatering systems required to perform excavation in the dry, backfilling work and exploitation of borrow areas.
2. Design, construction, maintenance and backfilling, if requested by Engineer, of all diversion trenches and ditches other than those shown on Drawings, including materials transportation, if required.
3. Design, construction, operation, maintenance, dismantling, including materials transportation, of settling basins or other approved apparatus, as required, to respect the amount of total suspended solids or other deleterious products which may be carried by water diverted into discharge lines.
4. Construction, operation and maintenance of the ditches and sedimentation ponds, specified herein and as shown on the Drawings, to collect and dispose of the water extracted by the dewatering operations.

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5. Supply and installation of temporary sandbags to control runoff, where required, all around deep excavations.
6. Disposal of all water in accordance with applicable provisions of all Applicable Laws. Water containing suspended sediments or chemical contaminants shall not be discharged into natural watercourses.
7. Draining/dewatering of the North-East pond of the proposed Site and preparation of a portion of the pond as a settling pond in accordance with Section 31 23 19 “Dewatering” subclause Section 3.2, “Draining/Dewatering of the North-East Pond”.

1.2 Related Sections

- Section 31 15 00 - Sources of Materials
- Section 31 23 00 – Excavation
- Exhibit 11 – Project-Wide Environmental Protection Plan for Components 3 and 4a


1.3 Submittals

At least fifteen (15) days before commencement of the dewatering works, Contractor shall submit for Engineer’s Acceptance, detailed drawings showing dewatering methods, materials, equipment, sequences and schedule. Contractor shall provide dewatering systems with adequate capacity to permit the undertaking of the Work.

Acceptance by Engineer of the dewatering systems shall not relieve Contractor from its responsibility to provide adequate systems to achieve the specified results.

1.4 Planning

Not used

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2 PRODUCTS

2.1 Materials and Equipment


Prior to installation, Contractor shall submit for Engineer's Acceptance, datasheets for all materials and equipment intended for use during dewatering Work. Contractor shall maintain all equipment in good working condition throughout the dewatering period.

The dewatering Work equipment shall permit completion of the Work in dry conditions, as well as allow the Work to proceed on schedule. The number and capacity of the pumps shall be adequate to extract water from the specified excavation Site at a variable rate of up to 5m³/min. Contractor shall have sufficient standby equipment in order to avoid any stoppage of the dewatering Work.

2.1.1 Dewatering Materials and Equipment

Dewatering materials and equipment shall include, but are not limited to the following:

- a) Perforated HDPE Pipes
- b) Adequate Power Supply
- c) Pumps
- d) Piping and Strainers
- e) Valves and Couplings
- f) Settling Basins
- g) Sandbags
- h) Flow Measuring Devices
- i) Insulation and Heating Systems, if required
- j) Various Accessories
- k) Silt Fencing

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2.1.2 Filter Materials for Dewatering Systems

Filter materials for dewatering systems shall consist of crushed and washed stone or clean and sieved granular materials. The particle size distribution of these materials shall be Accepted by Engineer before placement.

All materials used to backfill trenches, sumps, drainage and diversion ditches shall be Accepted by Engineer before placement.

3 EXECUTION

3.1 Dewatering Works

Dewatering in borrow pits and stockpile areas shall be in accordance with Section 31 15 00, "Sources of Materials".


Contractor shall construct, maintain and operate ditches and sedimentation ponds as shown on the Drawings and as specified herein.

The dewatering systems shall collect the surface water and seepage infiltrations, which may enter the work areas and divert them outside of work areas in a way that no water shall return to the work areas, either directly or by infiltration.

All runoff and seepage water in work areas of the transition compound and switchyards shall be pumped or directed into sedimentation ponds. The discharge pipes shall be provided with flow measuring devices.

When dewatering Work is carried out during winter conditions, Contractor shall adequately protect the dewatering systems and flow measuring devices, as well as ensure that they remain operational throughout the dewatering period.

Notwithstanding the minimum pumping capacity specified herein, Contractor retains full responsibility for the water control in its work areas.

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3.2 Draining/Dewatering of the Pond on the North-East Corner

Draining of existing pond on the North-East corner of the proposed substation and associated Work shall include:

- Draining shall include rerouting the existing/incoming water and by-pass the pond. Contractor shall use sand bags or approved equal procedure to reroute the incoming water. Draining shall be carried out by pumping the existing water to the nearest body of water. Contractor shall remove and dispose of the unsuitable material from the drained pond and replace it with backfill material as required to carry out the site grading work as specified and as required by Engineer.
- No fish shall be transferred from the North-East pond prior to draining. ~~Remaining fish shall be removed when pond is drained and disposed of by Contractor.~~ (T.S.) (BMC)
- Contractor may use the remaining portion of the pond as a settling pond for site water control.

3.3 Dismantlement of Dewatering Systems


Temporary dewatering systems (installed for dewatering purposes only) shall be dismantled, with Acceptance of Engineer, after Substantial Completion and prior to Final Completion.

Temporary sedimentation ponds (installed for dewatering purposes only) shall be dismantled with Acceptance of Engineer after Substantial Completion and prior to Final Completion.

3.4 Recording

Contractor shall provide, on approved forms, a weekly report containing all relevant information of the operation of each dewatering system. The report shall include, but is not limited to, the following:

- Location and description of dewatering installations
- Operation's details

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- Pumped water flows and volumes
- Water table
- Any other information required by Engineer

3.5 QA/QC Inspection and Documentation

3.5.1 Processes

Table 3-1 is a guideline that Contractor shall use during the course of this Work. This Table is for easy reference only and is by no means exhaustive. Contractor is not released from the responsibility of ensuring all Work meets the requirements as stipulated in this Technical Specification.

Table 3-1: Contractor Process Guidelines			
Section	Description	Frequency	Document Type
1.3 SUBMITTALS			
1.3	Contractor shall submit detailed plans of dewatering methods and sequences.	At least 15 days before commencement	Methods, Procedures and Schedule
2.1 MATERIALS AND EQUIPMENT			
2.1	Contractor shall submit to Engineer for Acceptance, information of materials and equipment to be used.	Prior to installation	Data sheets
2.1.2	Materials used as filters shall be Acceptable by Engineer.	During works	Approval
2.1.2	Backfilling materials shall be Acceptable by Engineer.	During works	Approval
3.4 RECORDING			
3.4	Contractor shall provide, on approved forms a weekly report.	Weekly	Report

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SECTION 31 23 23
SUBGRADE BASE COURSE CONSTRUCTION



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1 GENERAL

1.1 Work

This Section describes the supply of all labour, materials and equipment, as well as the execution of all Work required to construct the subgrade base course as shown on the drawings and as specified herein or as required by Engineer, all forming part of this Work.

The Work includes, but is not limited to, the following:

- Placing and compacting subgrade base course materials
- Constructing switchyard, including access roads

1.2 Related Sections

- Section 31 15 00 - Sources of Materials
- Section 31 23 19 - Dewatering
- Section 31 23 00 - Excavation
- Exhibit 11 – Project-Wide Environmental Protection Plan for Components 3 & 4a

1.3 References

The latest edition of the following standards shall be respected when executing this Work:


Code	Standard
ASTM D2487	Standard Test Method for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D422	Standard Test Method for Particle Size Analysis of Soils
ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³)

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Code	Standard
	(600 kN-m/m ³)
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³) (2,700 kN-m/m ³)
ASTM D2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D2216	Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D4253	Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth) Canadian Road Geometric Design (2011) NL Department of Transportation and Works

1.4 Submittals

At least fifteen (15) days before the beginning of the Work, Contractor shall submit to Engineer for Acceptance, the placement and compaction methods, the sequence, the source of materials, the equipment and the work schedule.

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2 PRODUCTS

2.1 Subgrade Base Course Materials

2.1.1 General

All material requirements specified herein shall be obtained from borrow areas, excavations or stockpile areas as specified in Section 31 15 00, “Sources of Materials”.

Subgrade base course materials shall be composed of sound and durable particles and be free of organic matter, branches, roots, peat, snow, ice, frozen materials and other materials not complying with the requirements of this Section.

All backfill material shall be well-graded, without absence or excess of any fraction whatsoever within the limits of the gradation specified herein and as shown on the drawings. Well-graded distribution means that the difference in the percentage passing between each successive specified sieve is about the same.

When only one dimension is specified to define the size of a material, this dimension is the maximum dimension of the components of this material. However, the minimum dimension of a boulder shall be at least one third of its largest dimension.

To obtain the required grading of material, crushing, separation, screening and homogenization equipment may be necessary. Contractor shall implement the means indicated in Section 31 15 00, “Sources of Materials”, and the chosen methods shall be submitted for Acceptance of Engineer.

Selected or processed placed rock for rockfills, rip rap for protection of slopes and ditches, common fill and granular (borrow) fill. Depths, lines and grades of subgrade base course material for yards and access roads shall be placed as per this Section and as shown on the Drawings.

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2.1.2 Not Used

2.1.3 Granular Materials

- Granular Materials shall be as defined in Section ³¹~~23~~ 15 00. Source of material and shall be obtained from the designated borrow areas and shall comply with the requirements specified herein.
- Granular Material shall be a mixture of sand, gravel and cobble and shall comply with the gradation requirements shown in Table 2-1:

Table 2-1: Granular Materials Gradation Requirements

Sieve Size (mm)	% Passing (By Dry Weight)
100	100
80	85 – 100
20	55 – 100
5	32 – 88
1.25	17 – 65
0.315	6 – 30
0.080	3 – 8

- Material for construction and upgrading access road topping shall comply as shown on Table 2-2.


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Table 2-2: Granular Materials Gradation Requirements (Maintenance Grade No. 2)

Sieve Size (mm)	% Passing (By Dry Weight)
25.4	100
9.51	55 – 80
4.76	35 – 60
1.20	15 – 35
0.3	5 – 20
.075	3 – 10

2.1.4 Rockfill Materials

Materials shall be obtained from the required excavations and shall comply with the requirements specified herein.

Materials shall be sound and durable rockfill. Rockfill elevation shall be a minimum of 1000 mm below the subgrade elevation.

Materials shall be a selected rockfill and shall comply with the following gradation requirements as shown on Table 2-3.


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Table 2-3: Rockfill Material Gradation Requirements

Sieve Size (mm)	% Passing (By Dry Weight)
500.0	100
200.0	88-100
150.0	75-97
100.0	55-90
50.8	30-70
9.51	7-40
4.75	4-30
1.2	0-15
0.3	0-8
0.075	0-5

2.1.5 Selected or Processed Riprap for Protection of Slopes, Ditches, & Culverts

Selected or processed riprap for slope, ditch, and culvert protection shall be obtained from the required excavations. Riprap shall consist of clean, hard durable rock having a density not less than 2.6 t/m³. The rock material if subjected to the Los Angeles Abrasion Test (ASTM C131-81) shall have a loss not greater than 35%. When tested for soundness, five cycles of magnesium sulphate, ASTM C88-76, the rock material shall have a loss not greater than 15. Contractor shall either select rockfill complying with the specified requirements directly from the source of materials, or by screening or crushing rockfill in order to meet the grading requirements, as shown on Table 2-4.


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Table 2-4: Rip-Rap Grading Limits

Max (kg)	Size (mm)	Finer by Mass (%)
75	380	100
50	330	70-90
25	260	40-55
15	220	-
10	190	-
5	150	-
2.5	120	0-15


2.1.6 Common Fill

As defined in Section 31 15 00, "Source of Material", common fill is selected and compactable material for backfilling at the switchyard is the in situ non-organic soil extracted from the required excavations at the switchyard. Common fill shall consist of a mixture of sand, silt, clay, gravel, obtained during the required excavation with a maximum particle size of 200 mm with 6-16% passing .075 mm sieve, unless otherwise specified by Engineer. The material shall be compactable to the density as specified in this Technical Specification.

2.2 Construction Equipment

2.2.1 General

The construction equipment shall comply with the requirements specified herein and shall be Accepted by Engineer. The equipment shall be maintained in good working condition throughout the duration of the Work, be available in adequate number and sized to ensure work completion within the prescribed timelines set out in Exhibit 9, "Work and Milestone Schedule".

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Contractor shall have, on the Site, measurement devices (load cells, tachometer, etc.) in order to prove that the Contractor's equipment is being used in accordance within the safe operating performance and the equipment specification.

2.2.2 Vibratory Roller

The vibratory roller shall be self-propelled and equipped with a smooth steel drum with cleaning devices. The power of the engine shall be adequate to comply with the requirements specified herein.

2.2.3 Padfoot Compactor

The padfoot compactor shall be self-propelled and equipped with a padfoot steel drum with cleaning devices. The power of the engine shall be adequate to comply with the requirements specified herein.

2.2.4 Special Compactors


Special compactors shall be used where the heavy rollers specified above cannot be used. They shall be capable of producing compaction equal to that produced by the equipment specified above. Where such compactors are used, the lift thickness shall be reduced as specified herein or as required by Engineer.

The number and efficiency of the special compactors shall be such that the required compaction will be obtained at a production rate consistent with that of the contiguous subgrade base course works.

2.2.5 Moisture Content Control Equipment

Contractor shall have the necessary equipment to spray water uniformly, aerate and mix the materials in order to adjust the moisture content.

Equipment to control the moisture content shall consist of water tankers, pressure distributors or other equipment designed to spray water uniformly and in controlled quantities. Water tankers shall be equipped with shut-off valves to prevent sprinkler leakage when not operating. This

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equipment shall be operated as required and in adequate numbers to produce the desired adjustments without delay in progress of the Work.

2.3 Geotextile

Geotextile shall be made of non-woven polyester or polypropylene fibres and shall be Accepted by Engineer prior to shipment to Site.

Geotextile for silt fence shall be Terrfence light duty as manufactured by Terrifix Geosynthetics Inc or approved equal. Geotextile for subsurface drain shall be Terrifix 270R as manufactured by Terrifix Geosynthetics Inc or approved equal. Geotextile for rehabilitation shall be Terrafix Rolled erosion control blanket Terranet 200 as manufactured by Terrifix Geosynthetics Inc or approved equal.


The geotextile rolls shall be well wrapped to protect the geotextile against sunlight (ultra-violet rays), mud, dust and any other factor which could affect its performance. The wrapping shall be made with an opaque polyethylene sheet. Each roll shall be correctly identified, with among other things the manufacturer's name, the type of geotextile and its dimension. Rolls of geotextile shall be stored in the shade and in the dry.

General Installation: place the roll of geotextile at the top of the slope/grade and roll down grade, overlap by 450 mm minimum. If the geotextile is used around perforated pipe, a minimum water follow of 200 L/min/m² is required.

Culvert: Culvert for the access road shown on the drawing for Soldiers Pond shall be corrugated metal pipe, helical lock seam fabricated, plain metallic coated. Profile 68x13 mm, wall thickness 2.0 mm, C/W standard manufactured universal dimple joint couplers.

Culvert: Culvert for the access roads and stream crossing to be designed and build by Contractor shall be submitted for the Acceptance of Engineer. It is recommended to follow the NL Department of Transportation and Work Standards.

Subsurface Drain: Subsurface drain shall be Corrugated Metal Pipe, helical lock seam fabricated, plain metallic coated. Profile 68x13 mm, wall thickness 2.0 mm, C/W standard

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manufactured universal dimple joint couplers. Subsurface drain shall be perforated. Subsurface drain shall be installed in compliance with NL Department of Transportation and Work Standards.

3 EXECUTION

3.1 Dewatering

Dewatering systems may be required during the subgrade base course construction. The installation, operation and maintenance of the dewatering systems shall be carried out in accordance with Section 31 23 19, "Dewatering".

3.2 Subgrade Base Course Placement

3.2.1 General

After grubbing, bog removal and excavation is completed, the surface of the in-situ material shall be compacted to meet the compaction requirements as per this Section.


Subgrade base course materials for backfill shall not be placed before obtaining Engineer's Acceptance.

~~Subgrade base course on rockfill shall be topped with 300 mm (min.) of compacted selected rockfill or crushed stone (size 100-150 mm) prior to placement of 700 mm common fill as shown on the Drawings.~~ (f.s.) (B. Mc)

Subgrade base course on excavated bedrock shall be as shown on Drawings.

Subgrade base course materials shall be placed so that each zone is homogeneous, free of stratifications, lenses, pockets, ruts and layers of material for which the gradation does not comply with the requirements specified herein.

The subgrade base course shall comply with the lines, slopes and elevations shown on the drawings or as specified herein and shall be constructed so as to avoid mixing materials of adjacent zones.

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No subgrade base course material, composed of granular or common fill only, shall be placed if rain, snow or cold weather is forecast or if the subgrade base course work cannot be performed in accordance with the requirements specified herein. Any subgrade base course material that becomes non-compliant due to freezing, rain or for any other reason shall be removed before the subsequent layers are placed and replaced with materials that comply with the requirements of this Section.

If Acceptable to Engineer, the granular and rockfill materials may be placed on frozen surfaces.

During freezing weather, Contractor shall transport the granular materials from the borrow pits or stockpile areas or required excavations to the structure in trucks with heated boxes.

Loading, transporting, dumping and spreading of all materials shall be carried out so as to avoid segregation. Should segregation occur, the materials shall be removed and replaced by materials complying with the requirements of this Section.


During dumping and spreading of materials, Contractor shall remove and dispose of all debris, vegetation or any other material not conforming to the requirements specified herein as specified in document LCP-SN-CD-4500-CV-SP-0001-01, "Scope of Work Specification".

3.3 Subgrade Base Course Compaction

3.3.1 General

Each subgrade base course layer shall be compacted before placement of the subsequent layer as specified herein. The passage of tractors or hauling units on the subgrade base course shall not be a substitute for compaction by the equipment specified herein.

After spreading of each lift to the required thickness and moisture content, it shall be compacted as specified herein. Base course material shall be placed in lifts not more than 300 mm thick and shall be compacted to the specified density as per this Technical Specification. It shall not be placed or compacted when its moisture content exceeds the optimum limit, unless directed by Engineer.

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Compaction shall be carried out on large surfaces and the number of passes of the compaction equipment shall be executed carefully to obtain uniform compaction.

The passes of the compactor shall overlap each other by approximately 1/4 of its width. A pass shall be entirely completed before starting the subsequent pass.

If the required compaction of a portion of subgrade base course is not obtained with the number of passes specified and provided that all other specified requirements have been respected, additional compaction may be required by Engineer. If the additional compaction does not produce the specified results, the materials shall be removed and disposed of in the waste disposal area.


Subgrade base course, excluding rock fill, shall be compacted to at least 98 percent of its Standard Proctor Maximum Dry Density (SPMDD). Compaction of the rockfill shall be observed and judged by the amount of any movement in each layer of the rockfill with the passing of the compacting equipment and as Accepted by Engineer.

Procedure for placement and compaction of the borrow fill shall be the same as the common fill. Top of the granular fill (i.e. subgrade) shall have the elevation as shown on drawings and as required by Engineer.

3.3.2 Construction Tolerances

All subgrade base course zones shall be continuous and the average limit of each layer shall respect the contact limit with the adjacent area, as shown on the Drawings.

Final subgrade base course slopes shall be constructed within a maximum tolerance of 30 mm vertical and 150 mm horizontal to the lines shown on the Drawings. The slopes shall be generally flat and uniform.

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3.4 QA/QC Inspection and Documentation

3.4.1 Control Tests

Contractor shall undertake tests on each subgrade base course and materials such as in-situ density, grain size analysis and compaction tests. During testing and sampling, Contractor shall stop all activities within a 10 m radius of the testing and sampling areas. Test results shall be submitted to Engineer for Acceptance prior to proceeding for the next lift of the subgrade material.

3.4.2 Processes

Table 3-1 is a guideline that Contractor shall use during the course of this subgrade base course work. This table is for easy reference only and is by no means exhaustive. Contractor is not released from the responsibility of ensuring all work meets the requirements as stipulated in this Technical Specification.

Table 3-1: Contractor Process Guideline			
Section	Description	Frequency	Document Type
1.4 SUBMITTALS			
1.4	Contractor shall submit methods, sequence, and source of materials, equipment and operating schedules.	15 days before beginning of works	Methods
2.3 GEOTEXTILE			
2.3	The geotextile shall be Accepted by Engineer.	Before the delivery on site.	Approval
3.2 SUBGRADE BASE COURSE PLACEMENT			
3.2.1	Contractor shall obtain Engineer's Acceptance before placing granular or rockfill materials on frozen surfaces.	Before the subgrade base course is placed	Approval



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Table 3-1: Contractor Process Guideline			
Section	Description	Frequency	Document Type
3.3 SUBGRADE BASE COURSE COMPACTION			
3.3.1	Additional compaction may be required by Engineer.	At any time	Directive

 SNC • LAVALIN	GENERAL TECHNICAL REQUIREMENTS Earthworks – Soldiers Pond Section 31 23 23 (Subgrade Base Course Construction)		Revision		
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APPENDIX A


Environmental Requirements

Refer to Exhibit 11 Document, "Project-Wide Environmental Protection Plan"

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	SLI Doc. No. 505573-4000-47EG-0006		01	13-Jan-2014	B

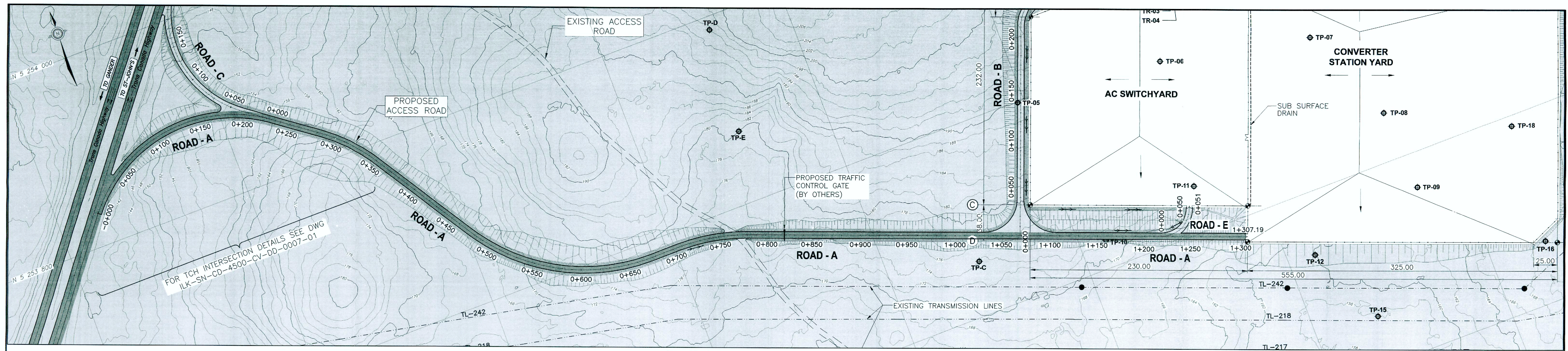
APPENDIX B

Benchmark Reference Point

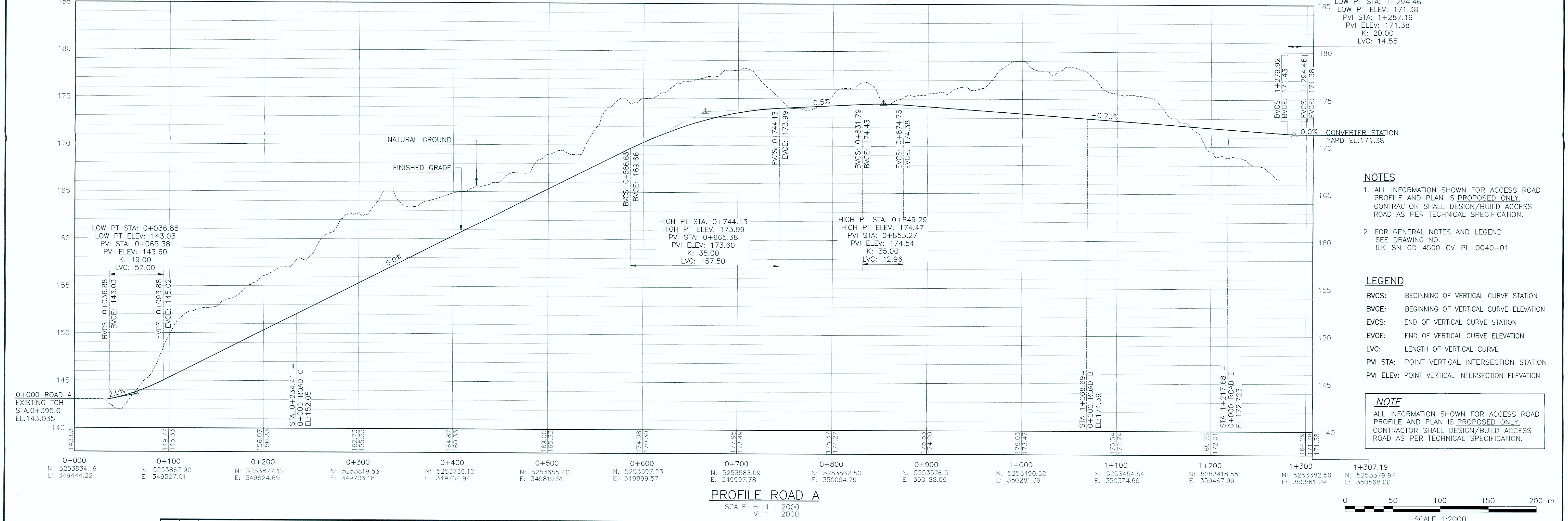
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	Nalcor Doc. No. LCP-SN-CD-4500-CV-TS-0001-01		C2	Date	
	SLI Doc. No. 505573-4000-47EG-0006		01	13-Jan-2014	

LOWER CHURCHILL PROJECT (Geodigital Control Network 2010)						
Local Area Control Network Adjusted Values, NAD83(CSRS), CGG2005						
Station	Latitude (DMS)	Longitude (DMS)	UTM Zone	Easting (m)	Northing (m)	H-MSL (m)
96G8020	47° 22' 17.31078"	-53° 16' 38.46343"	22	328070.433	5248960.78	137.31
82G3129	47° 38' 26.55811"	-53° 56' 19.95869"	22	279263.937	5280552.907	10.369
78G2015	48° 9' 54.81409"	-53° 57' 32.97788"	22	279976.394	5338899.815	6.903
13SP001	47° 24' 53.879"	52° 59' 10.708"	22	350165.464	5253192.134	157.880
13SP002	47° 24' 50.116"	52° 58' 43.956"	22	350723.040	5253061.657	156.161
13SP003	47° 25' 18.999"	52° 59' 05.283"	22	350298.923	5253964.662	207.438
*926037	47° 25' 01.547"	53° 00' 02.785"	22	349080.376	5253456.789	177.249

*Existing Provincial Monument on TCH



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SCALE: 1 : 2000



PROFILE ROAD A
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NOTES

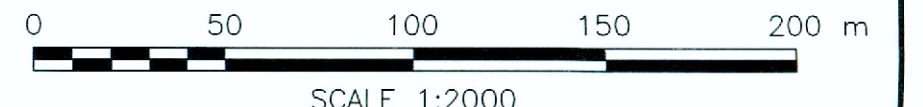
- ALL INFORMATION SHOWN FOR ACCESS ROAD PROFILE AND PLAN IS PROPOSED ONLY. CONTRACTOR SHALL DESIGN/BUILD ACCESS ROAD AS PER TECHNICAL SPECIFICATION.
- FOR GENERAL NOTES AND LEGEND SEE DRAWING NO. ILK-SN-CD-4500-CV-PL-0040-01

LEGEND

BVCS: BEGINNING OF VERTICAL CURVE STATION
 BVCE: BEGINNING OF VERTICAL CURVE ELEVATION
 EVCS: END OF VERTICAL CURVE STATION
 EVCE: END OF VERTICAL CURVE ELEVATION
 LVC: LENGTH OF VERTICAL CURVE
 PVI STA: POINT VERTICAL INTERSECTION STATION
 PVI ELEV: POINT VERTICAL INTERSECTION ELEVATION

NOTE

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 To practice Professional Engineering in Newfoundland and Labrador.
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ISSUE	REV.	DATE	DISTRIBUTION & STATUS
1	C1	22-AUG-2013	ISSUED FOR CONSTRUCTION
2	C2	18-DEC-2013	RE-ISSUED FOR CONSTRUCTION

No.	DATE	REVISION	MOD.	VER.	APP.
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2	18-DEC-2013	ALL SLI REF. NUMBERS REMOVED.			

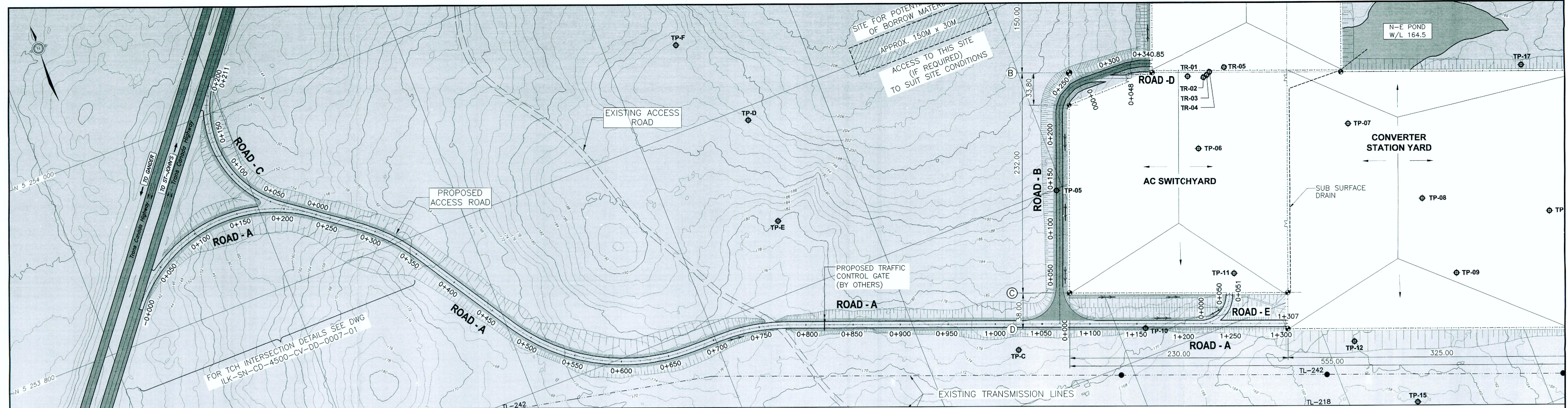
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 1. REVIEWED AND ACCEPTED NO COMMENTS
 2. REVIEWED - INCORPORATE COMMENTS, REVISE & RESUBMIT
 3. REVIEWED - NOT ACCEPTED
 4. INFORMATION ONLY
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 LEAD REVIEWER: *[Signature]* Date (dd-mm-yyyy): 23 JAN 2014
 PROJECT MANAGER: *[Signature]* Date (dd-mm-yyyy): 24 JAN 2014

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 REGISTERED PROFESSIONAL ENGINEER
R. WADHWA
 19 DEC 2013
 PROVINCE OF NEWFOUNDLAND

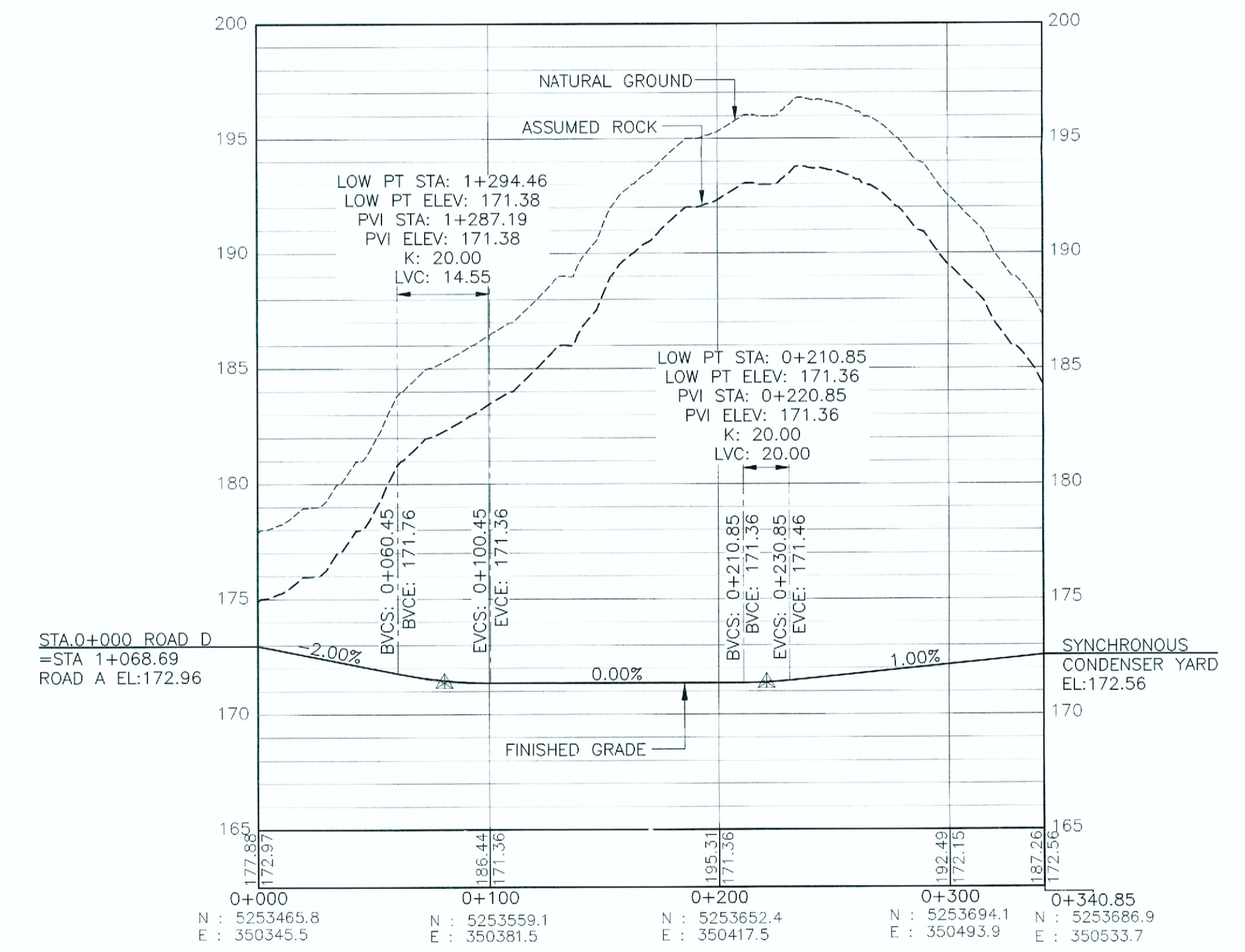
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CLIENT
nalcor
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 PROJECT TITLE: **SOLDIERS POND 230 KV SOLDIERS POND SWITCHYARD ACCESS ROAD PLAN VIEW (ROAD A)**
 SLI DOC No. 505573-4500-4RDD-2901_09
 NE DOC No. ILK-SN-CD-4500-CV-PL-0036-01
 Rev. C2

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PROFILE ROAD B
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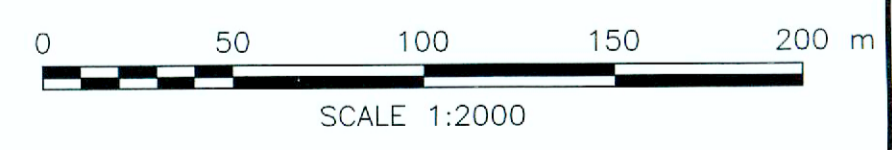
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- FOR GENERAL NOTES AND LEGEND SEE DRAWING NO. ILK-SN-CD-4500-CV-PL-0040-01

LEGEND

- BVCS: BEGINNING OF VERTICAL CURVE STATION
- BVCE: BEGINNING OF VERTICAL CURVE ELEVATION
- EVCS: END OF VERTICAL CURVE STATION
- EVCE: END OF VERTICAL CURVE ELEVATION
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PROVINCE OF NEWFOUNDLAND
PERMIT HOLDER
CLASS "A"
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To practice Professional Engineering in Newfoundland and Labrador. Permit No. as issued by PEGNL N045B which is valid for the year 2013.

ISSUE	REV.	DATE	DISTRIBUTION & STATUS	No.	REFERENCE DRAWING
1	C2	18-DEC-2013	RE-ISSUED FOR CONSTRUCTION	ILK-SN-CD-4500-CV-PL-0040-01	SOLDIERS POND 230 kV SP SWITCHYARD ACCESS ROAD DETAILS - NOTES
1	C1	22-AUG-2013	ISSUED FOR CONSTRUCTION	ILK-SN-CD-4500-CV-PL-0031-01	SOLDIERS POND 230 kV SP SUBSTATION ACCESS ROAD TCH INTERSECTION - PLAN, PROFILE AND SECTIONS
1	C1	22-AUG-2013	ISSUED FOR CONSTRUCTION	ILK-SN-CD-4500-CV-PL-0031-01	SOLDIERS POND 230 kV SP SUBSTATION SITE GRADING AND LEVELING
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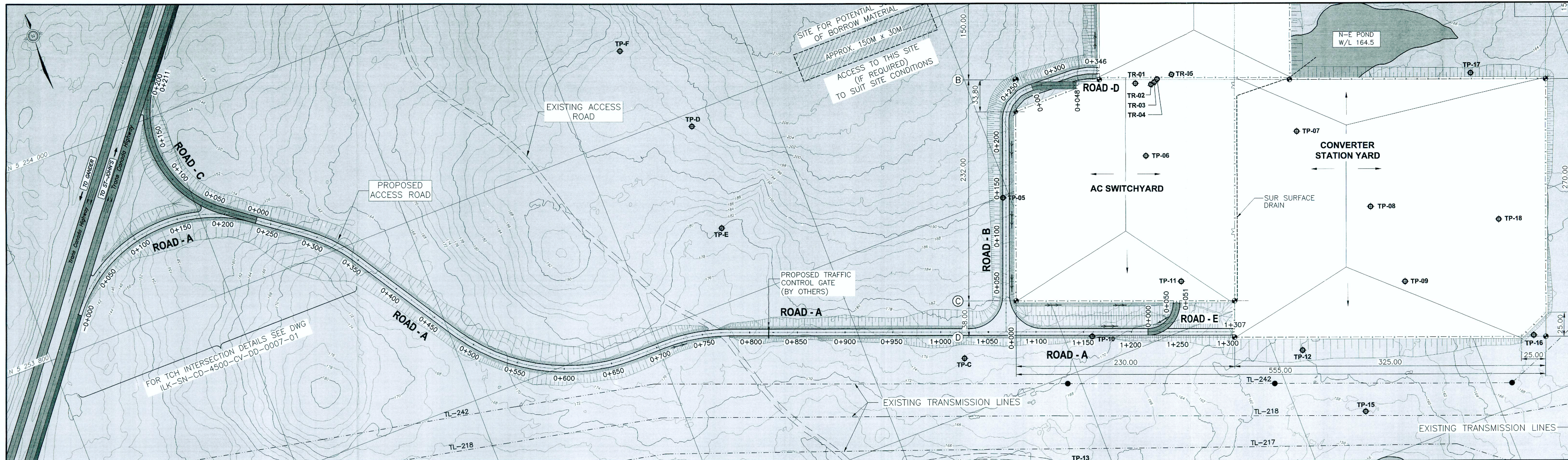
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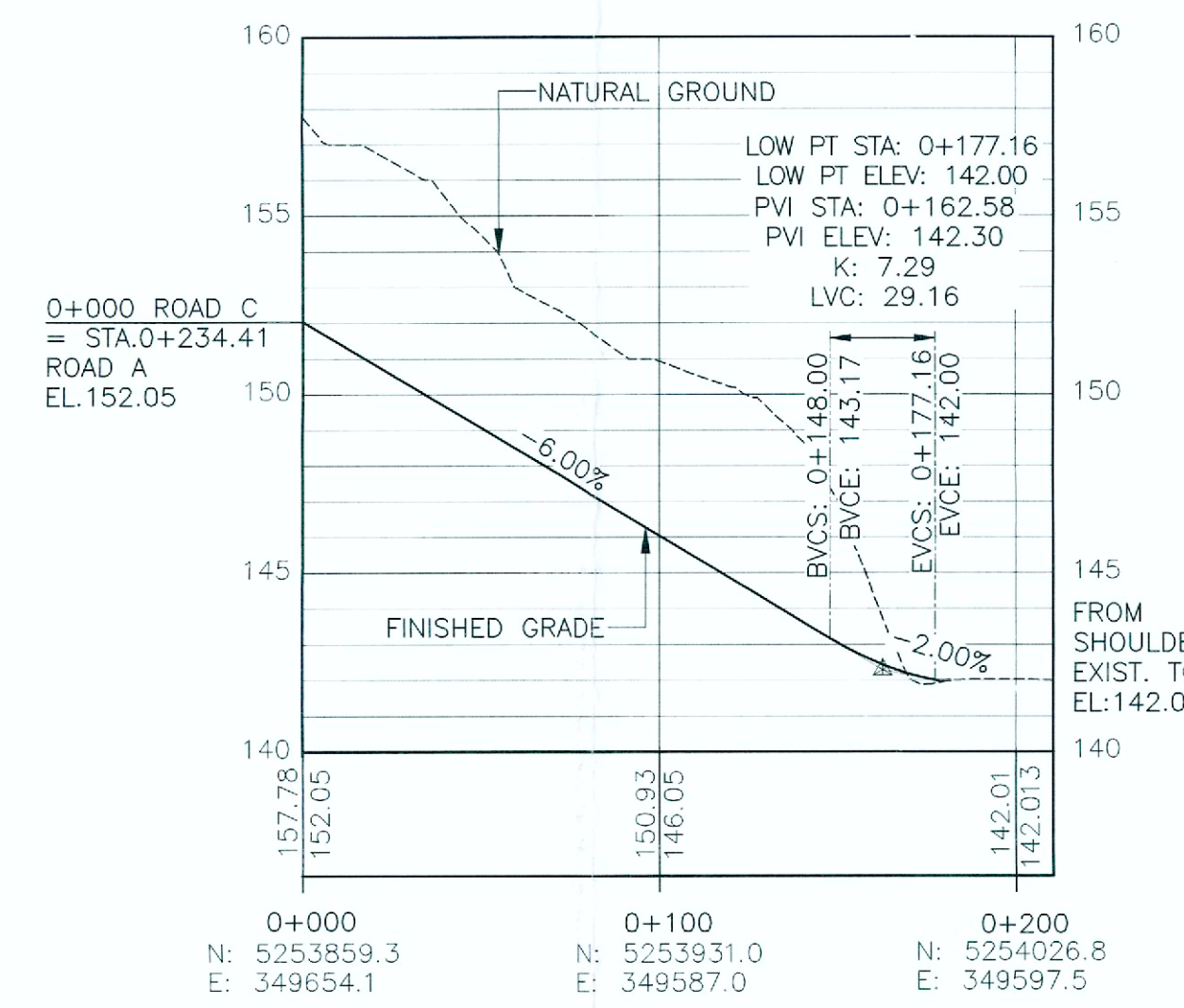
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B. S. WADHWA
19 DEC 2013
PROVINCE OF NEWFOUNDLAND

DESIGNED	APPROVED (Discipline Lead Engineer)
R. WADHWA	AMW
DRAWN	APPROVED (Engineering Manager)
S. BUTT/M. T. GARAVITO	
VERIFIED	
R. WADHWA	
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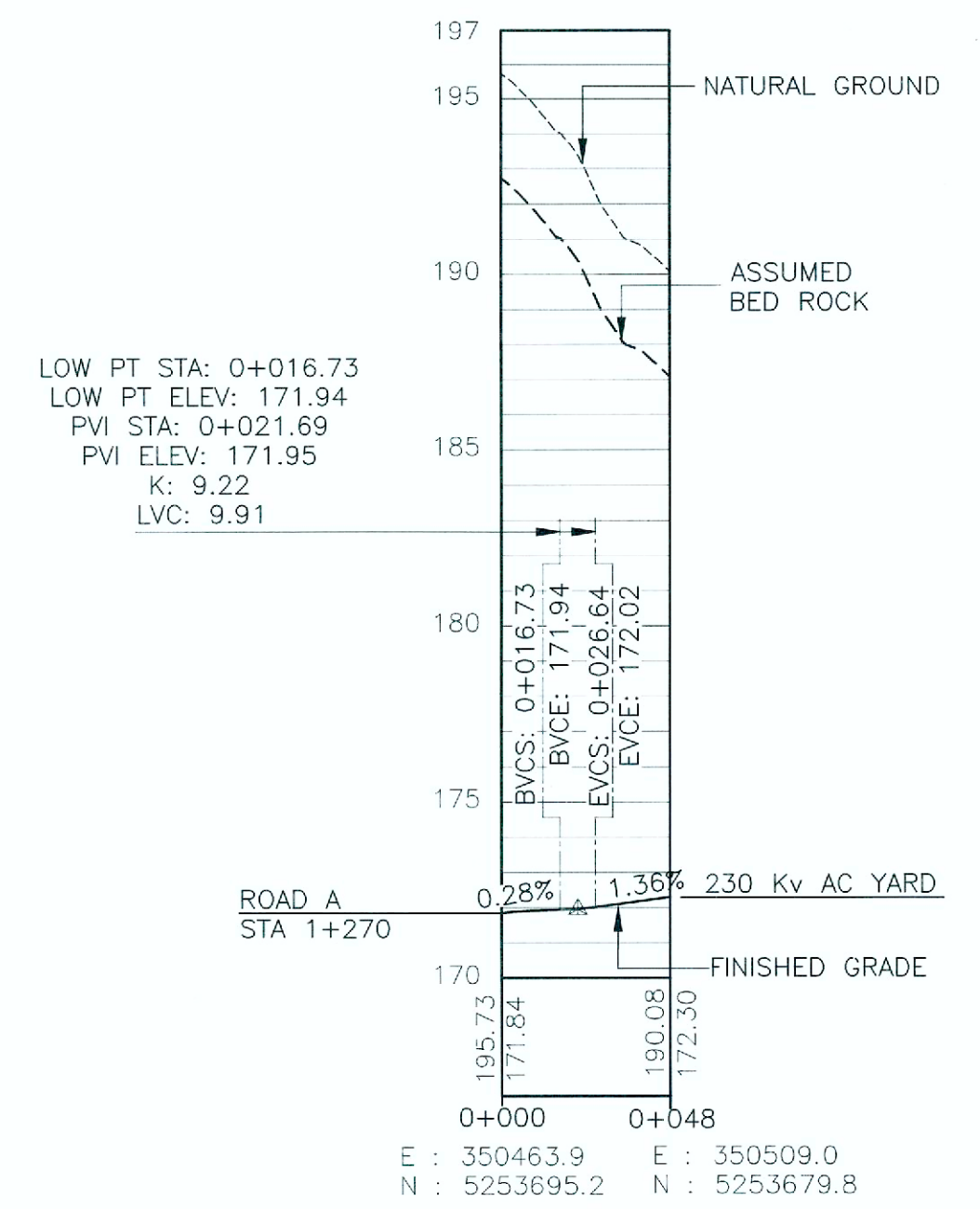
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SNC-LAVALIN	LOWER CHURCHILL PROJECT
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505573-4500-4RDD-2902-07	ILK-SN-CD-4500-CV-PL-0038-01
Rev.	C2



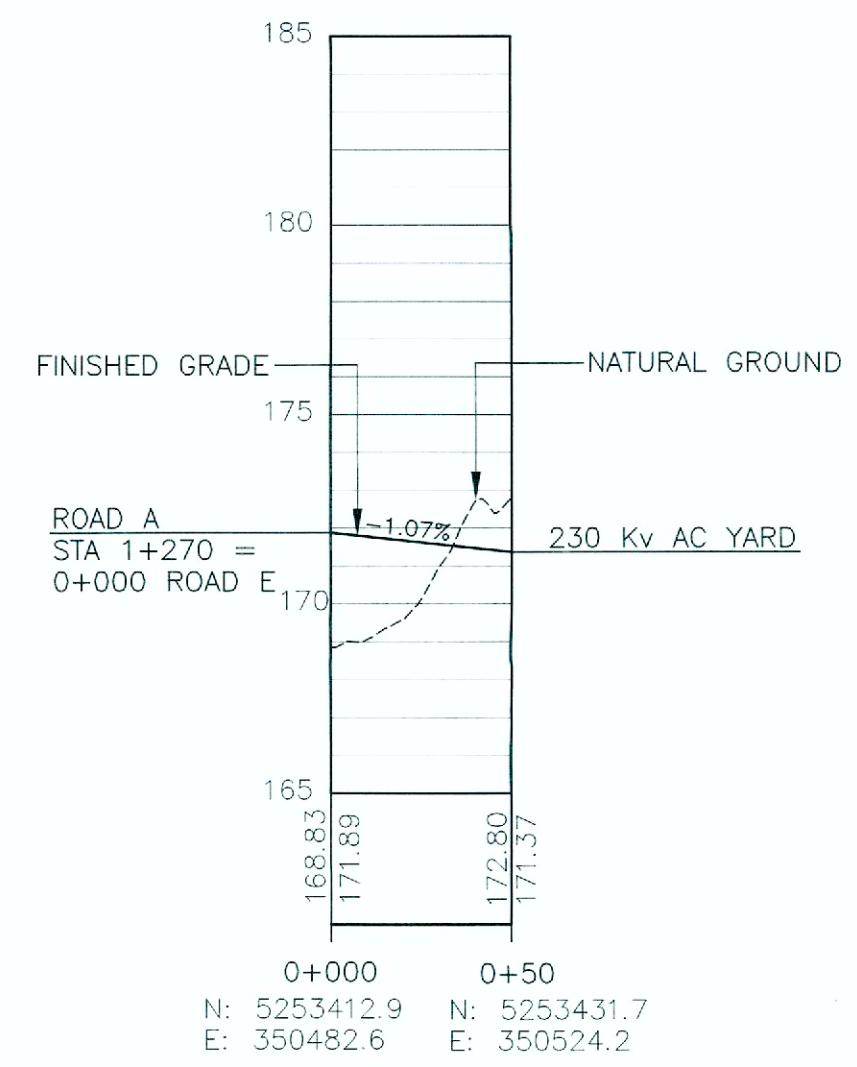
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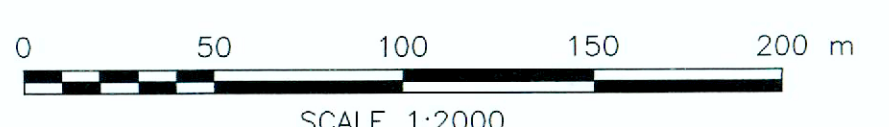


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- LEGEND**
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2	C2	18-DEC-2013	RE-ISSUED FOR CONSTRUCTION	1	ILK-SN-CD-4500-CV-PL-0037-01
1	C1	22-AUG-2013	ISSUED FOR CONSTRUCTION	1	ILK-SN-CD-4500-CV-PL-0037-01

No.	DATE	REVISION	MOD.	VER.	APP.
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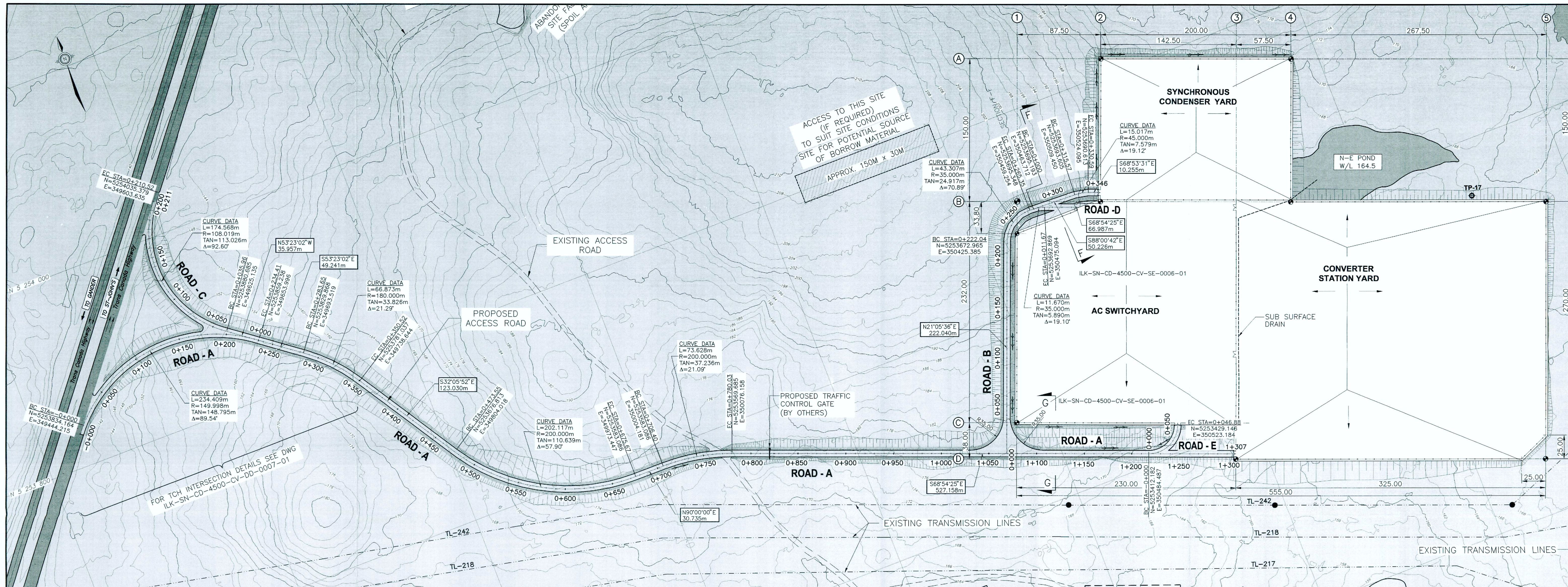
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2. REVIEWED - INCORPORATE COMMENTS, REVISE & RESUBMIT
3. REVIEWED - NOT ACCEPTED
4. INFORMATION ONLY
5. NOT REVIEWED
LEAD REVIEWER: *Blair McMillan*
DATE: 23-Jan-2014
DATE: 19-DEC-2013
DATE: 24-Jan-2014
DATE: 24-Jan-2014

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REGISTERED PROFESSIONAL ENGINEER
R. S. WADHWA
19 DEC 2013
PROVINCE OF NEWFOUNDLAND

SNC-LAVALIN
DESIGNED: *R. Wadhwa*
DRAWN: *S. Butt*
VERIFIED: *R. Wadhwa*
DATE: 24-04-2013
SUI DOC No. 505573-4500-4RDD-2903_07

CLIENT: **nalcor**
PROJECT: LOWER CHURCHILL PROJECT
TITLE: SOLDIERS POND 230 KV SOLDIERS POND SWITCHYARD ACCESS ROAD PLAN VIEW (ROAD C, D & E)
SCALE: 1 : 2000
NE DOC No. ILK-SN-CD-4500-CV-PL-0039-01
Rev. C2

Z:\Proj\505573 Lower Churchill\WBS 4000 Area Substations\CD503 Substation Earthworks\40-Engineering\41-Civil\41DD-Drawings\Soldiers 505573-4500-4RDD-2903_07.dwg 2013.12.19/3:48pm



PLAN ROAD

SCALE: 1 : 2000

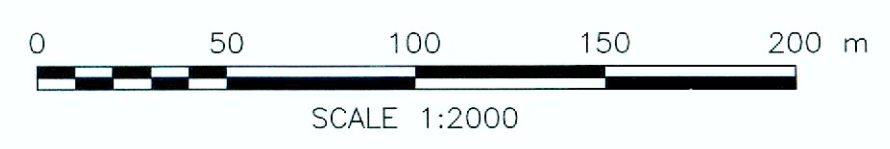
GENERAL NOTES:

- FOR GENERAL NOTES, FOR SITE PREPARATION SEE DRAWING NO. ILK-SN-CD-4500-CV-PL-0037-01
- COORDINATES SHOWN ARE PROJECTION: UTM 22, METERS. DATUM: NAD83 (CSRS). VERTICAL DATUM: CGG 2005 GEOID MODEL.
- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS
- ELEVATIONS SHOWN ALONG SECTIONS ARE BASED ON CONTOURS SHOWN ON DRAWING
- DESIGN PARAMETERS FOR ACCESS ROAD SECTION BETWEEN PROPOSED TRAFFIC GATE AND THE SUBSTATION SHALL BE:
 DESIGN SPEED 60 km/h
 MINIMUM CURVE RADIUS 60m
 MINIMUM SIGHT DISTANCE 45m
 MINIMUM CREST CURVE PARAMETER (k)4
 MINIMUM SAG CURVE PARAMETER (k)8
- ROUTING OF ACCESS ROAD MAY CHANGE TO SUIT SITE CONDITIONS
- ACCESS ROAD SHALL BE BUILT AS PER CANADIANS ROAD GEOMETRIC DESIGN 2011 AND NL DEPARTMENT OF TRANSPORTATION AND WORKS (DTW).
- EQUIPMENT LOAD TO BE TRANSPORTED ON ACCESS ROAD MAY BE IN THE ORDER OF 300 METRIC TONS
- PERMANENT SIGNAGE ON TCH AND ACCESS ROAD SHALL INCLUDE:
 - SOLDIERS POND EXIT
 - SOLDIERS POND SUBSTATION RESTRICTED ENTRY
 - SPEED LIMIT
 - EXIT
 - RAMP
 - MOOSE CROSSING
 - NO U-TURN
 - MERGE
 - TURN
 - SINGLE LANE
 - OTHER SIGN AS REQUIRED BY DTW
- MAXIMUM VERTICAL GRADIENT FOR ACCESS ROAD SHALL BE 6%.
- THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF ALL ENVIRONMENTAL PROTECTION MEASURES.
- CONTRACTOR SHALL DESIGN/BUILD ACCESS ROAD TO SUBSTATION, INCLUDING "Y" INTERSECTION WITH TRANS-CANADA HIGHWAY (TCH).
- DESIGN OF ACCESS ROAD SHALL BE BASED ON RLU60 CLASSIFICATION TO PROPOSED TRAFFIC GATE. BEYOND TRAFFIC GATE TO SUBSTATION, REFER TO NOTE 5 ON THIS DWG. FOR DESIGN PARAMETERS.
- CONTRACTOR SHALL DESIGN AND INSTALL CULVERTS AS REQUIRED. MINIMUM SIZE OF CULVERT SHALL BE 800 mm DIAMETER, UNLESS OTHERWISE NOTED.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE DRAWING ILK-SN-CD-4500-CV-DD-0007-01
- INTERSECTION BETWEEN ACCESS ROAD TO SUBSTATION WITH EXISTING ACCESS ROAD SHALL BE IN COMPLIANCE WITH DTW STANDARDS.

LEGEND:

- BC: BEGINNING CURVE
- EC: END CURVE
- x-x- SWITCHYARD FENCE
- ←← DITCH WITH DRAIN DIRECTION
- - - SLOPE DIRECTION
- 180- CONTOURS @ 2m INTERVAL ELEVATION IN METERS
- ||||| EDGE OF SLOPE
- SITE OF BORROW MATERIAL

NOTE
 ALL INFORMATION SHOWN FOR ACCESS ROAD PROFILE AND PLAN IS PROPOSED ONLY. CONTRACTOR SHALL DESIGN/BUILD ACCESS ROAD AS PER TECHNICAL SPECIFICATION.



ISSUE	REV.	DATE	DISTRIBUTION & STATUS	ILK-SN-CD-4500-CV-PL-0006-01	REFERENCE DRAWING
2	C2	18-DEC-2013	RE-ISSUED FOR CONSTRUCTION	ILK-SN-CD-4500-CV-DD-0007-01	SOLDIERS POND 230 kV SP SUBSTATION ACCESS ROAD TCH INTERSECTION - PLAN, PROFILE AND SECTIONS
1	C1	22-AUG-2013	ISSUED FOR CONSTRUCTION	ILK-SN-CD-4500-CV-PL-0037-01	SOLDIERS POND 230 kV SP SUBSTATION SITE GRADING AND LEVELING

No.	DATE	REVISION	MOD.	VER.	APP.
1	18-DEC-2013	ALL SUI REF. NUMBERS REMOVED.			

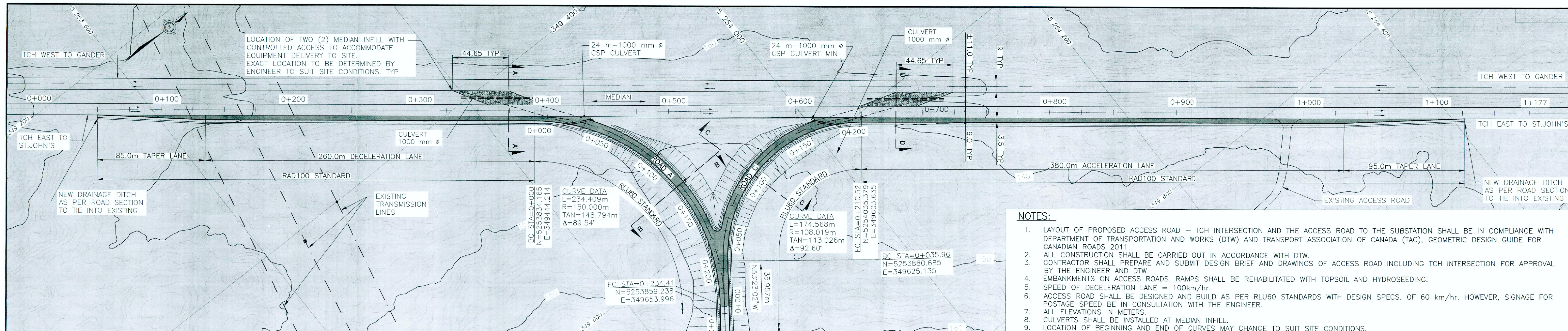
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PROFESSIONAL STAMP
 R. B. WADHWA
 19 DEC 2013
 PROVINCE OF NEWFOUNDLAND

SNC-LAVALIN
 DESIGNED: R. WADHWA
 DRAWN: S. BUTT / M. T. GARAVITO
 VERIFIED: R. WADHWA
 DATE: 24-04-2013
 SCALE: 1 : 2000

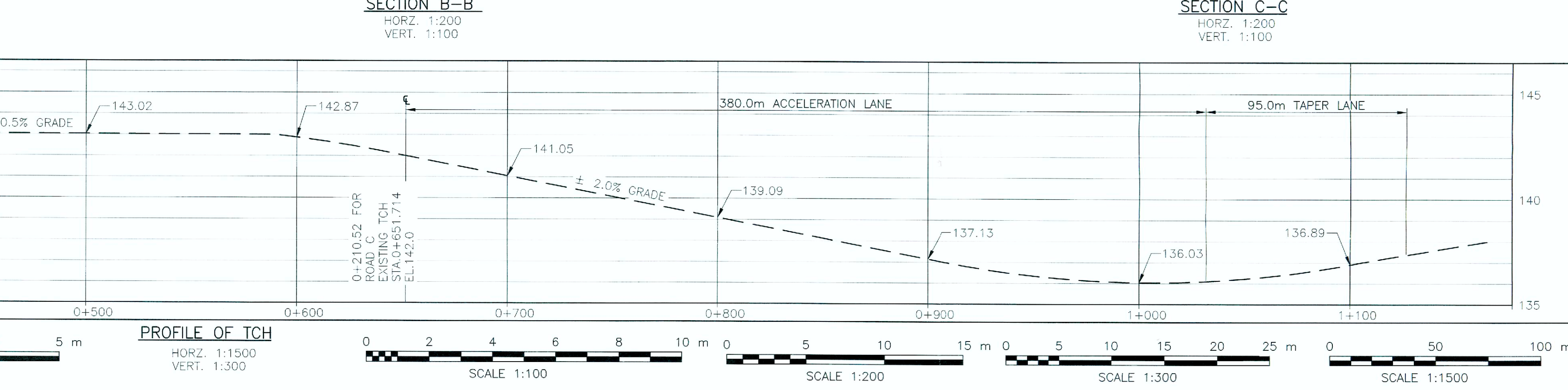
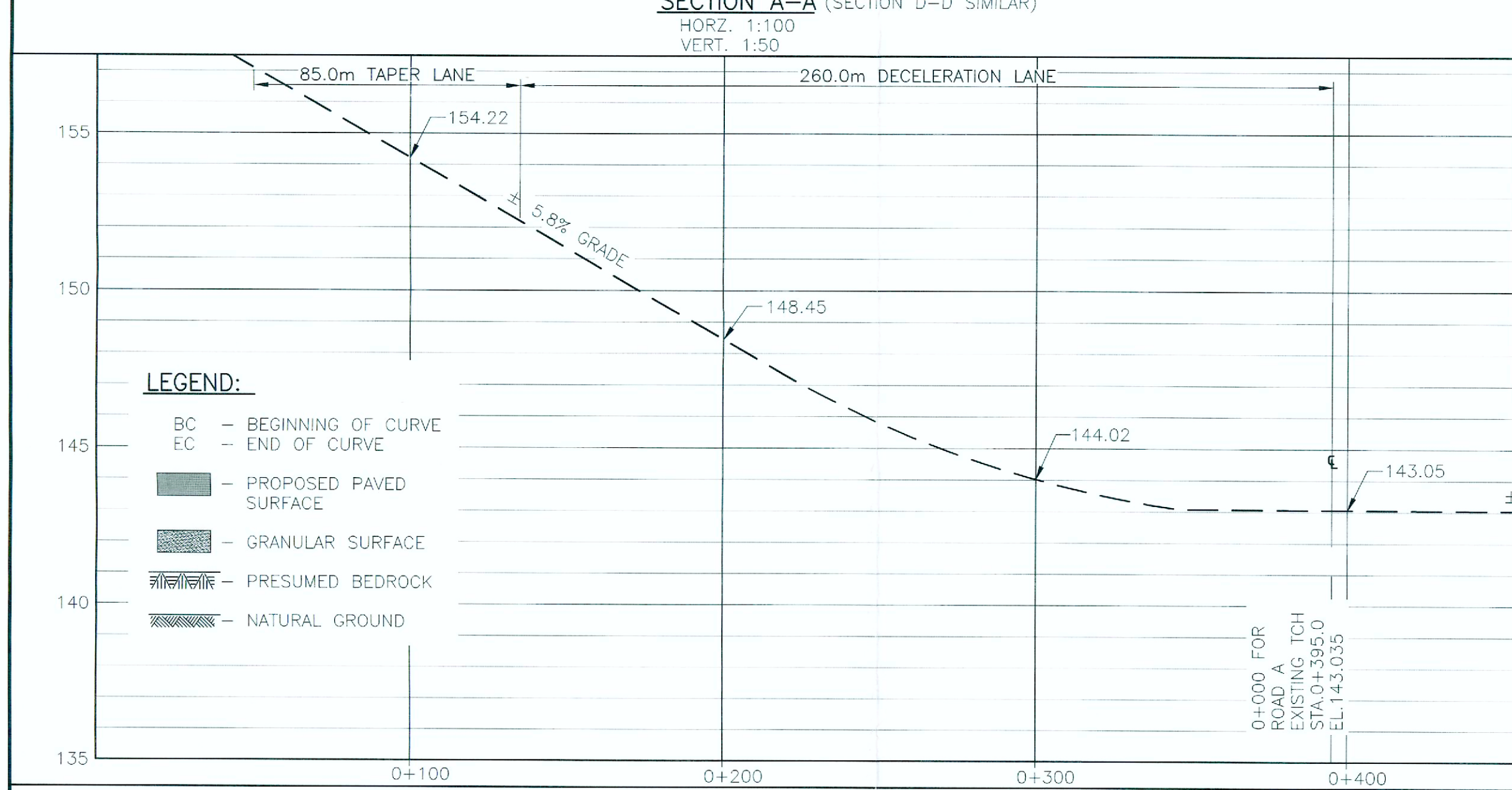
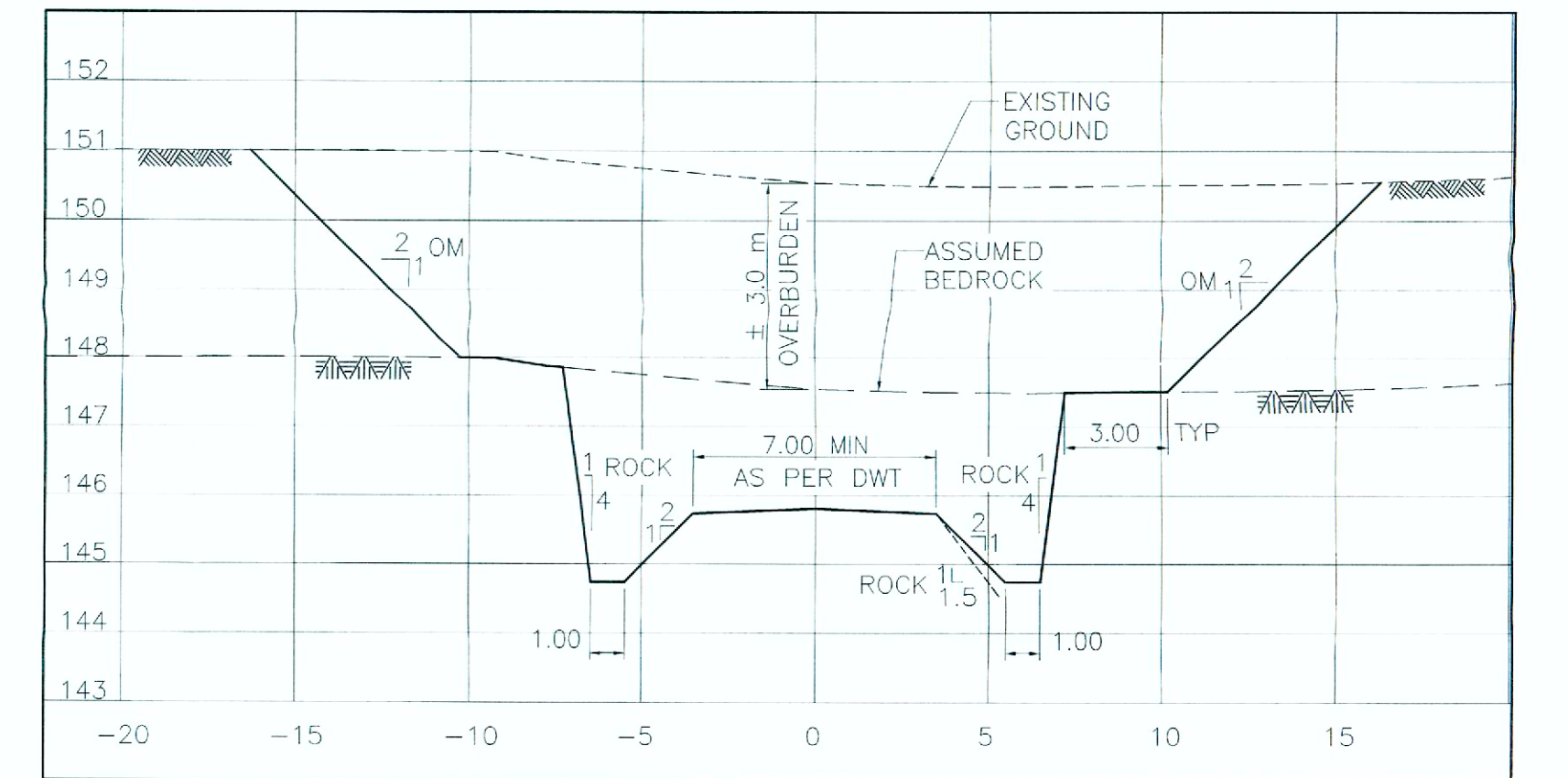
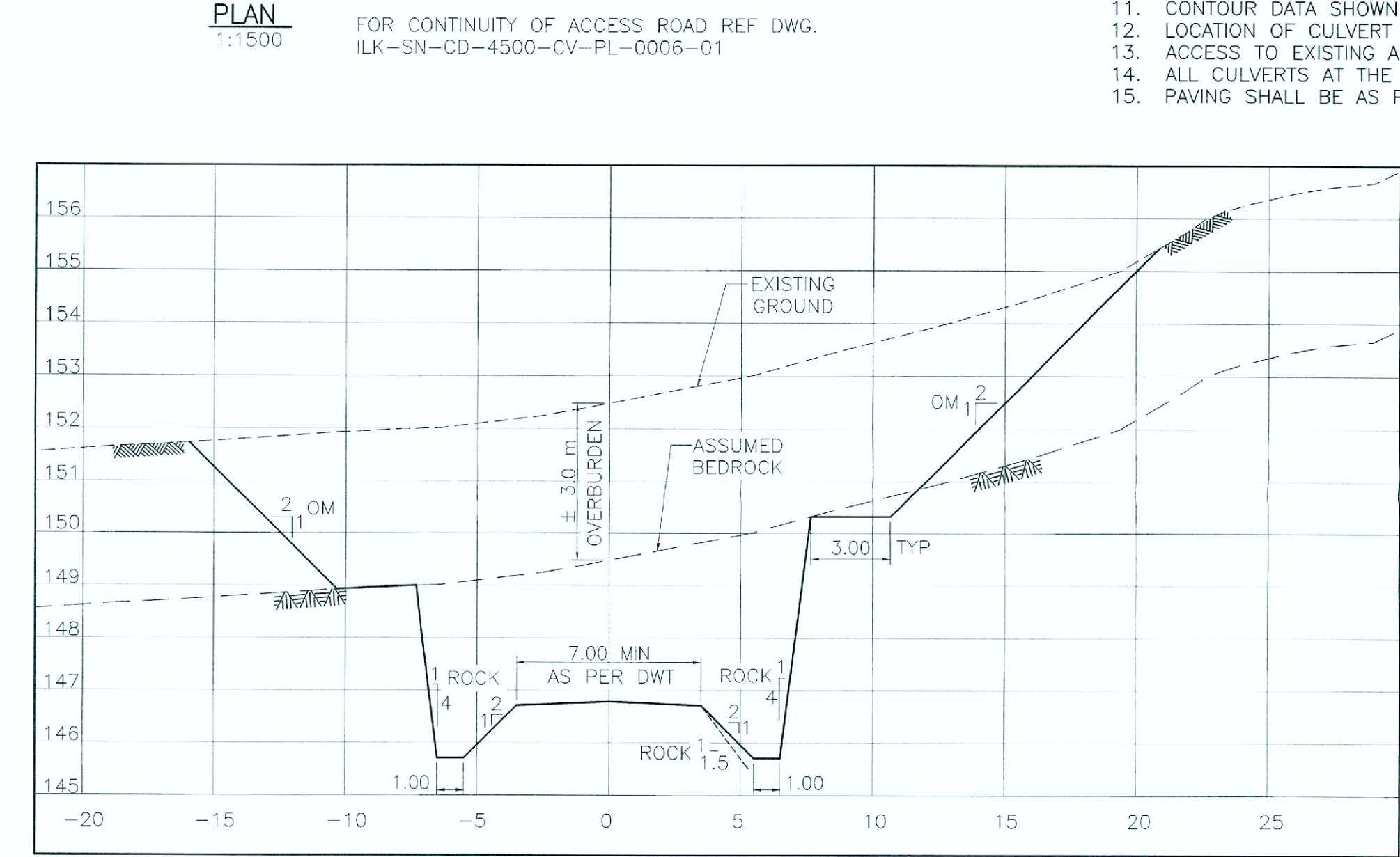
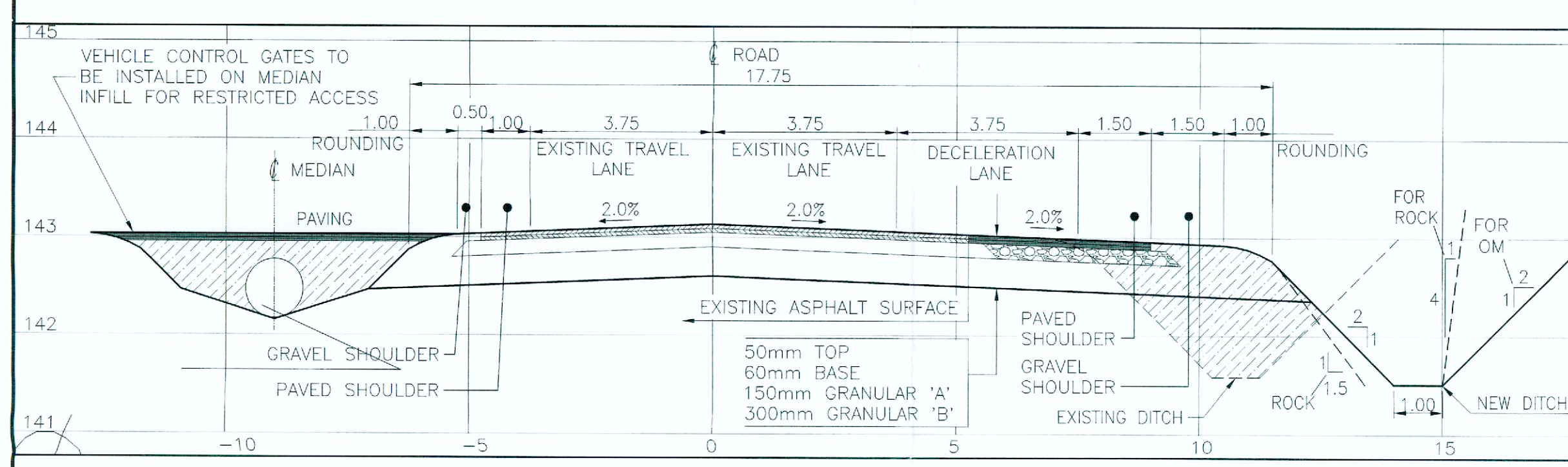
nalcor
 CLIENT: LOWER CHURCHILL PROJECT
 PROJECT: LOWER CHURCHILL PROJECT
 TITLE: SOLDIERS POND 230 kV SOLDIERS POND SWITCHYARD ACCESS ROAD DETAILS NOTES
 SU DOC No: 505573-4500-4RDD-2904-09
 NE DOC No: ILK-SN-CD-4500-CV-PL-0040-01
 Rev: C2

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- NOTES:**
- LAYOUT OF PROPOSED ACCESS ROAD - TCH INTERSECTION AND THE ACCESS ROAD TO THE SUBSTATION SHALL BE IN COMPLIANCE WITH DEPARTMENT OF TRANSPORTATION AND WORKS (DTW) AND TRANSPORT ASSOCIATION OF CANADA (TAC), GEOMETRIC DESIGN GUIDE FOR CANADIAN ROADS 2011.
 - ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH DTW.
 - CONTRACTOR SHALL PREPARE AND SUBMIT DESIGN BRIEF AND DRAWINGS OF ACCESS ROAD INCLUDING TCH INTERSECTION FOR APPROVAL BY THE ENGINEER AND DTW.
 - EMBANKMENTS ON ACCESS ROADS, RAMPS SHALL BE REHABILITATED WITH TOPSOIL AND HYDROSEEDING.
 - SPEED OF DECELERATION LANE = 100km/hr.
 - ACCESS ROAD SHALL BE DESIGNED AND BUILT AS PER RL60 STANDARDS WITH DESIGN SPECS. OF 60 km/hr. HOWEVER, SIGNAGE FOR POSTAGE SPEED BE IN CONSULTATION WITH THE ENGINEER.
 - ALL ELEVATIONS IN METERS.
 - CULVERTS SHALL BE INSTALLED AT MEDIAN INFILL.
 - LOCATION OF BEGINNING AND END OF CURVES MAY CHANGE TO SUIT SITE CONDITIONS.
 - MATERIAL SPECIFIED FOR EXTENSION OF EXISTING ROADWAY (HIGHWAY) SHALL BE AS PER DTW RAD100 STANDARDS.
 - CONTOUR DATA SHOWN ARE AS PER PROVINCIAL GOVERNMENT SURVEY AND MAPPING DIVISION.
 - LOCATION OF CULVERT REQUIRED AT JUNCTION OF TCH AND ACCESS ROAD MAY CHANGE TO SUITE SITE CONDITIONS.
 - ACCESS TO EXISTING ACCESS ROAD SHALL REMAIN OPEN DURING CONSTRUCTION.
 - ALL CULVERTS AT THE INTERSECTION SHALL BE AS REQUIRED BY DESIGN BUT SHALL BE 1000 mm DIA. MINIMUM.
 - PAVING SHALL BE AS PER NEWFOUNDLAND DTW AND TO THE EXTENT, AS SHOWN.

NOTE
ALL INFORMATION SHOWN FOR ACCESS ROAD PROFILE AND PLAN IS PROPOSED ONLY. CONTRACTOR SHALL DESIGN/BUILD ACCESS ROAD AS PER TECHNICAL SPECIFICATION.



- LEGEND:**
- BC - BEGINNING OF CURVE
 - EC - END OF CURVE
 - PROPOSED PAVED SURFACE
 - GRANULAR SURFACE
 - PRESUMED BEDROCK
 - NATURAL GROUND

PROVINCE OF NEWFOUNDLAND PERMIT HOLDER CLASS "A"
SNC-LAVALIN Inc.
To practice Professional Engineering in Newfoundland and Labrador Permit No. as issued by PEONL N0468 which is valid for the year 2013.

ISSUE	REV.	DATE	DISTRIBUTION & STATUS
2	C2	18-DEC-2013	RE-ISSUED FOR CONSTRUCTION
1	C1	22-AUG-2013	ISSUED FOR CONSTRUCTION

No.	DATE	REVISION	MOD.	VER.	APP.
1	18-DEC-2013	ALL SLI REF. NUMBERS REMOVED.			

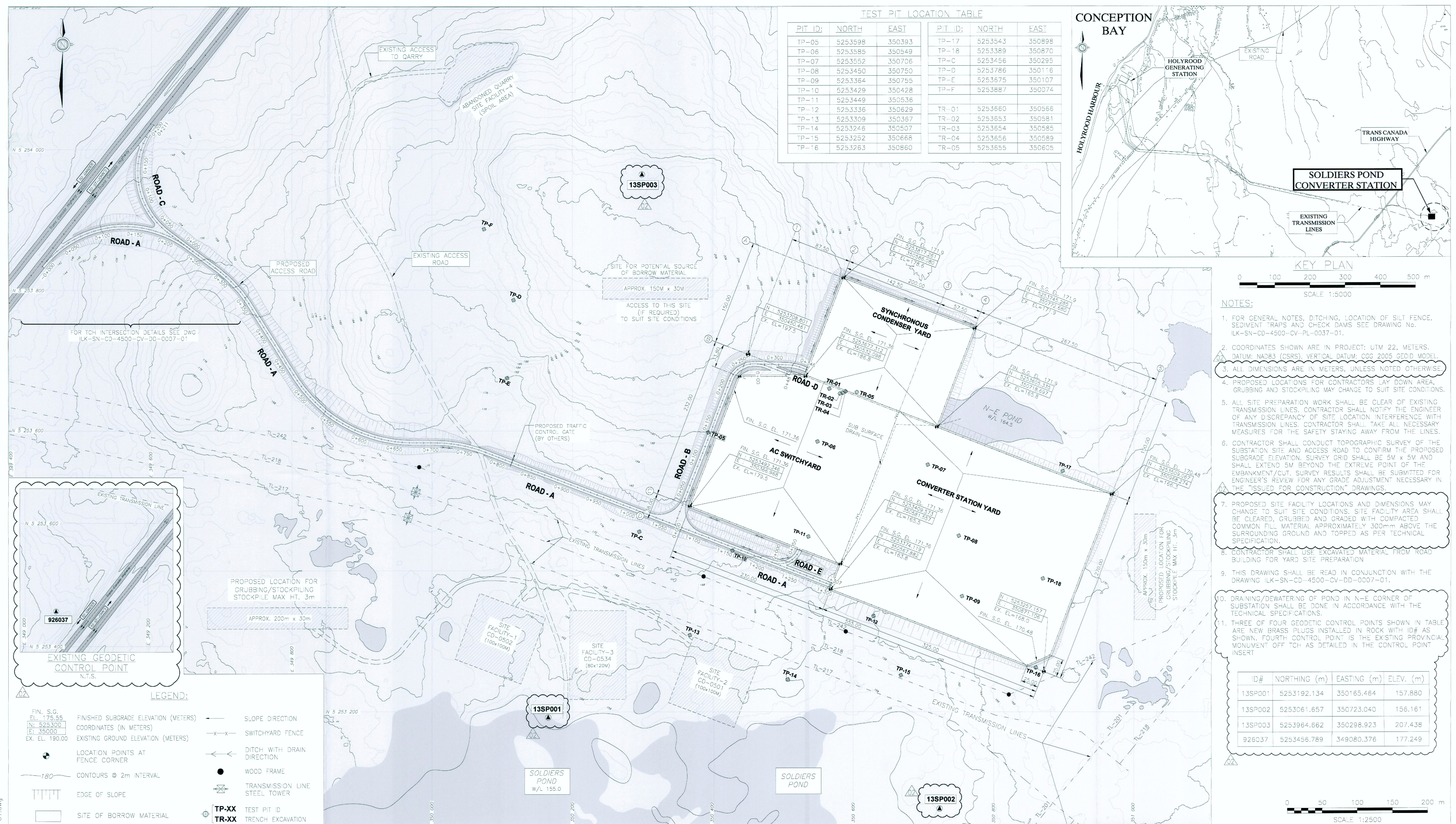
REVIEW CLASS: FOR INTERNAL USE ONLY
EQUIPMENT TAG NUMBER:
REVIEW DOES NOT CONSTITUTE APPROVAL OF DESIGN DETAILS, CALCULATIONS, TEST METHODS OR MATERIAL DEVELOPED AND/OR SELECTED BY THE CONTRACTOR, NOR DOES IT RELIEVE THE CONTRACTOR FROM FULL COMPLIANCE WITH CONTRACTUAL OR OTHER OBLIGATIONS.
1. REVIEWED AND ACCEPTED - NO COMMENTS
2. REVIEWED - INCORPORATE COMMENTS, REVISE & RESUBMIT
3. REVIEWED - NOT ACCEPTED
4. INFORMATION ONLY
5. NOT REVIEWED
LEAD REVIEWER: [Signature]
DATE: 23-JAN-2014
PROJECT MANAGER: [Signature]
DATE: 29-JAN-2014

PROFESSIONAL STAMP
REGISTERED PROFESSIONAL ENGINEER
R. S. WADHWA
19-DEC-2013
PROVINCE OF NEWFOUNDLAND

SNC-LAVALIN
DESIGNED: R. WADHWA
DRAWN: [Signature]
W. ORONSAYE /S. BUTT
VERIFIED: T. VILLARAZA
DATE: 21-JAN-2013
SCALE: AS NOTED

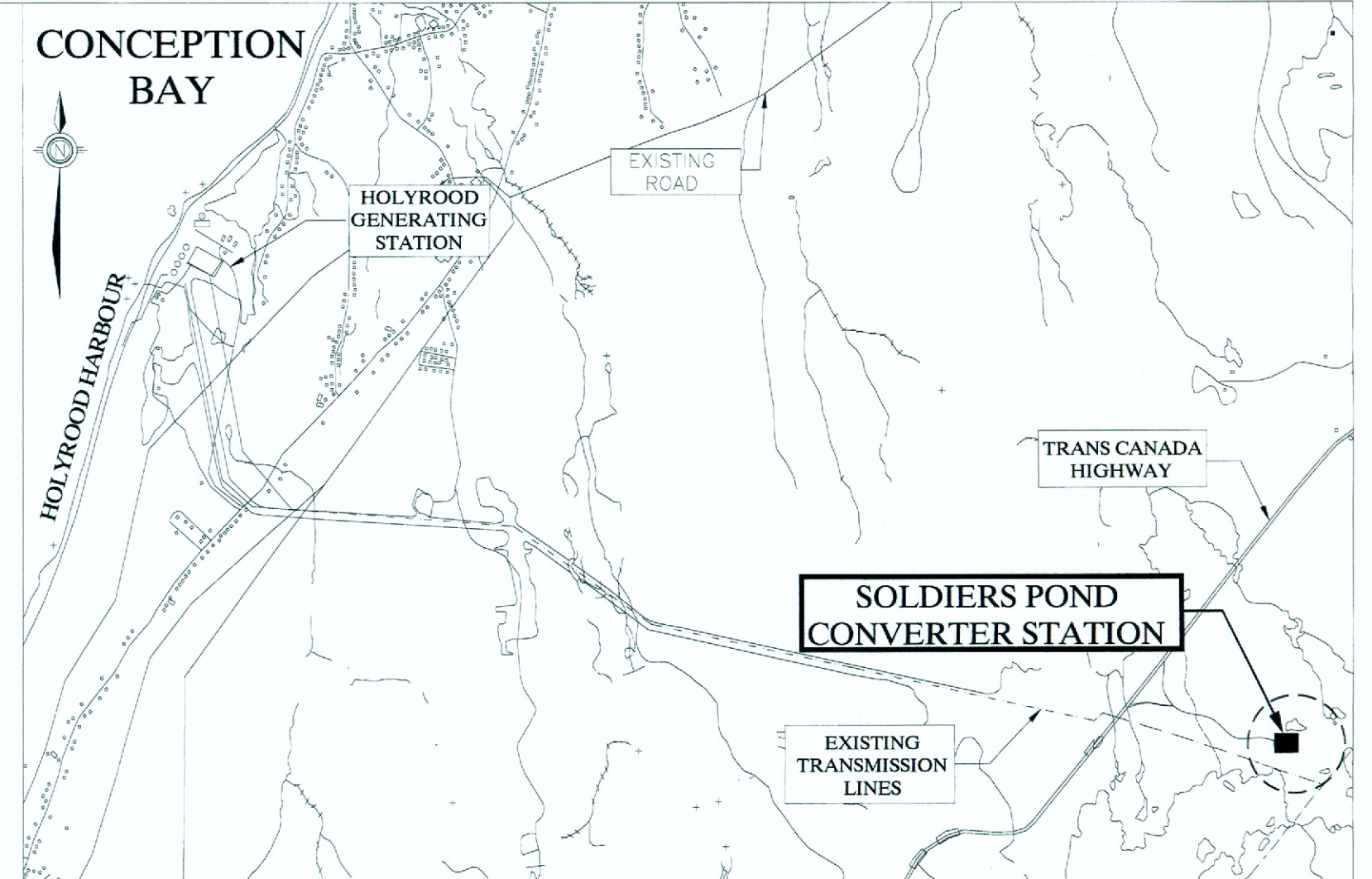
CLIENT: nalcor
PROJECT: LOWER CHURCHILL PROJECT
TITLE: SOLDIERS POND 230 kV SOLDIERS POND SUBSTATION ACCESS ROAD TCH INTERSECTION PLAN, PROFILE AND SECTIONS

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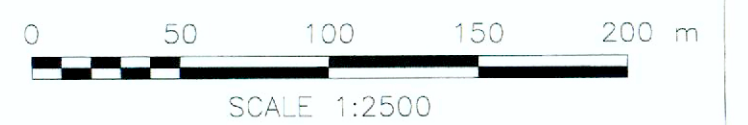
TEST PIT LOCATION TABLE

PIT ID:	NORTH	EAST	PIT ID:	NORTH	EAST
TP-05	5253598	350393	TP-17	5253543	350898
TP-06	5253585	350549	TP-18	5253389	350870
TP-07	5253552	350706	TP-C	5253456	350295
TP-08	5253450	350750	TP-D	5253786	350116
TP-09	5253364	350755	TP-E	5253675	350107
TP-10	5253429	350428	TP-F	5253887	350074
TP-11	5253449	350536	TR-01	5253660	350566
TP-12	5253336	350629	TR-02	5253653	350581
TP-13	5253309	350367	TR-03	5253654	350585
TP-14	5253246	350507	TR-04	5253656	350589
TP-15	5253252	350668	TR-05	5253655	350605
TP-16	5253263	350860			



- NOTES:**
- FOR GENERAL NOTES, DITCHING, LOCATION OF SILT FENCE, SEDIMENT TRAPS AND CHECK DAMS SEE DRAWING No. ILK-SN-CD-4500-CV-PL-0037-01.
 - COORDINATES SHOWN ARE IN PROJECT: UTM 22, METERS. DATUM: NAD83 (CSRS), VERTICAL DATUM: CGG 2005 GEOD. MODEL.
 - ALL DIMENSIONS ARE IN METERS, UNLESS NOTED OTHERWISE.
 - PROPOSED LOCATIONS FOR CONTRACTORS LAY DOWN AREA, GRUBBING AND STOCKPILING MAY CHANGE TO SUIT SITE CONDITIONS.
 - ALL SITE PREPARATION WORK SHALL BE CLEAR OF EXISTING TRANSMISSION LINES. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCY OF SITE LOCATION INTERFERENCE WITH TRANSMISSION LINES. CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES FOR THE SAFETY STAYING AWAY FROM THE LINES.
 - CONTRACTOR SHALL CONDUCT TOPOGRAPHIC SURVEY OF THE SUBSTATION SITE AND ACCESS ROAD TO CONFIRM THE PROPOSED SUBGRADE ELEVATION. SURVEY GRID SHALL BE 5M x 5M AND SHALL EXTEND 5M BEYOND THE EXTREME POINT OF THE EMBANKMENT/CUT. SURVEY RESULTS SHALL BE SUBMITTED FOR ENGINEER'S REVIEW FOR ANY GRADE ADJUSTMENT NECESSARY IN THE "ISSUED FOR CONSTRUCTION" DRAWINGS.
 - PROPOSED SITE FACILITY LOCATIONS AND DIMENSIONS MAY CHANGE TO SUIT SITE CONDITIONS. SITE FACILITY AREA SHALL BE CLEARED, GRUBBED AND GRADED WITH COMPACTED COMMON FILL MATERIAL APPROXIMATELY 300mm ABOVE THE SURROUNDING GROUND AND TOPPED AS PER TECHNICAL SPECIFICATION.
 - CONTRACTOR SHALL USE EXCAVATED MATERIAL FROM ROAD BUILDING FOR YARD SITE PREPARATION.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE DRAWING ILK-SN-CD-4500-CV-DD-0007-01.
 - DRAINING/DEWATERING OF POND IN N-E CORNER OF SUBSTATION SHALL BE DONE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
 - THREE OF FOUR GEODETIC CONTROL POINTS SHOWN IN TABLE ARE NEW BRASS PLUGS INSTALLED IN ROCK WITH ID# AS SHOWN. FOURTH CONTROL POINT IS THE EXISTING PROVINCIAL MONUMENT OFF TCH AS DETAILED IN THE CONTROL POINT INSERT

ID#	NORTHING (m)	EASTING (m)	ELEV. (m)
13SP001	5253192.134	350165.464	157.880
13SP002	5253061.657	350723.040	156.161
13SP003	5253964.662	350298.923	207.438
926037	5253456.789	349080.376	177.249



LEGEND:

FIN. S.G. EL. 175.55 N: 5253300 E: 350000 EX. EL. 190.00	FINISHED SUBGRADE ELEVATION (METERS) COORDINATES (IN METERS) EXISTING GROUND ELEVATION (METERS)	— SLOPE DIRECTION
●	LOCATION POINTS AT FENCE CORNER	-x-x- SWITCHYARD FENCE
180	CONTOURS @ 2m INTERVAL	← DITCH WITH DRAIN DIRECTION
	EDGE OF SLOPE	● WOOD FRAME
□	SITE OF BORROW MATERIAL	— TRANSMISSION LINE STEEL TOWER
⊕ TP-XX	TEST PIT ID	
⊖ TR-XX	TRENCH EXCAVATION	

PROVINCE OF NEWFOUNDLAND PERMIT HOLDER CLASS "A"
SNC-LAVALIN Inc.
To practice Professional Engineering in Newfoundland and Labrador. Permit No. as issued by PEGNL N045B which is valid for the year 2013.

ISSUE	REV.	DATE	DISTRIBUTION & STATUS	ILK-SN-CD-4500-CV-PL-0001-01	SOLDIERS POND PLAN LOCATION 230 KV SWITCHYARD AND CONVERTER SUBSTATION	No.	DATE	REVISION	MOD.	VER.	APP.
2	C2	18-DEC-2013	RE-ISSUED FOR CONSTRUCTION	ILK-SN-CD-4500-CV-DD-0007-01	SOLDIERS POND 230 KV SP SUBSTATION ACCESS ROAD TCH INTERSECTION - PLAN, PROFILE AND SECTIONS	2	18-DEC-2013	ALL SJ REF. NUMBERS REMOVED, NOTES NUMBERING CORRECTED, NOTES 3, 7 AND 10 REVISED, NOTE 11 ADDED			
1	C1	22-AUG-2013	ISSUED FOR CONSTRUCTION	ILK-SN-CD-4500-CV-PL-0037-01	SOLDIERS POND 230 KV SP SUBSTATION SITE GRADING AND LEVELING	1	26-NOV-2013	CHANGE IN TEXT TO NOTE # 6.			

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REVIEW DOES NOT CONSTITUTE APPROVAL OF DESIGN DETAILS, CALCULATIONS, TEST METHODS OR MATERIAL DEVELOPED AND/OR SELECTED BY THE CONTRACTOR, NOR DOES IT RELIEVE THE CONTRACTOR FROM FULL COMPLIANCE WITH CONTRACTUAL OR OTHER OBLIGATIONS.

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2. REVIEWED - INCORPORATE COMMENTS, REVISE & RESUBMIT
3. REVIEWED - NOT ACCEPTED
4. INFORMATION ONLY
5. NOT REVIEWED

LEAD REVIEWER: *[Signature]* Date (dd-mm-yyyy): 23-Jan-2014

NE-LCP MANAGEMENT: *[Signature]* Date (dd-mm-yyyy): 24-Jan-2014

PROJECT MANAGER: *[Signature]* Date (dd-mm-yyyy): 24-Jan-2014

PROFESSIONAL STAMP

R. S. WADHWA
19 Dec. 2013
PROVINCE OF NEWFOUNDLAND

SNC-LAVALIN

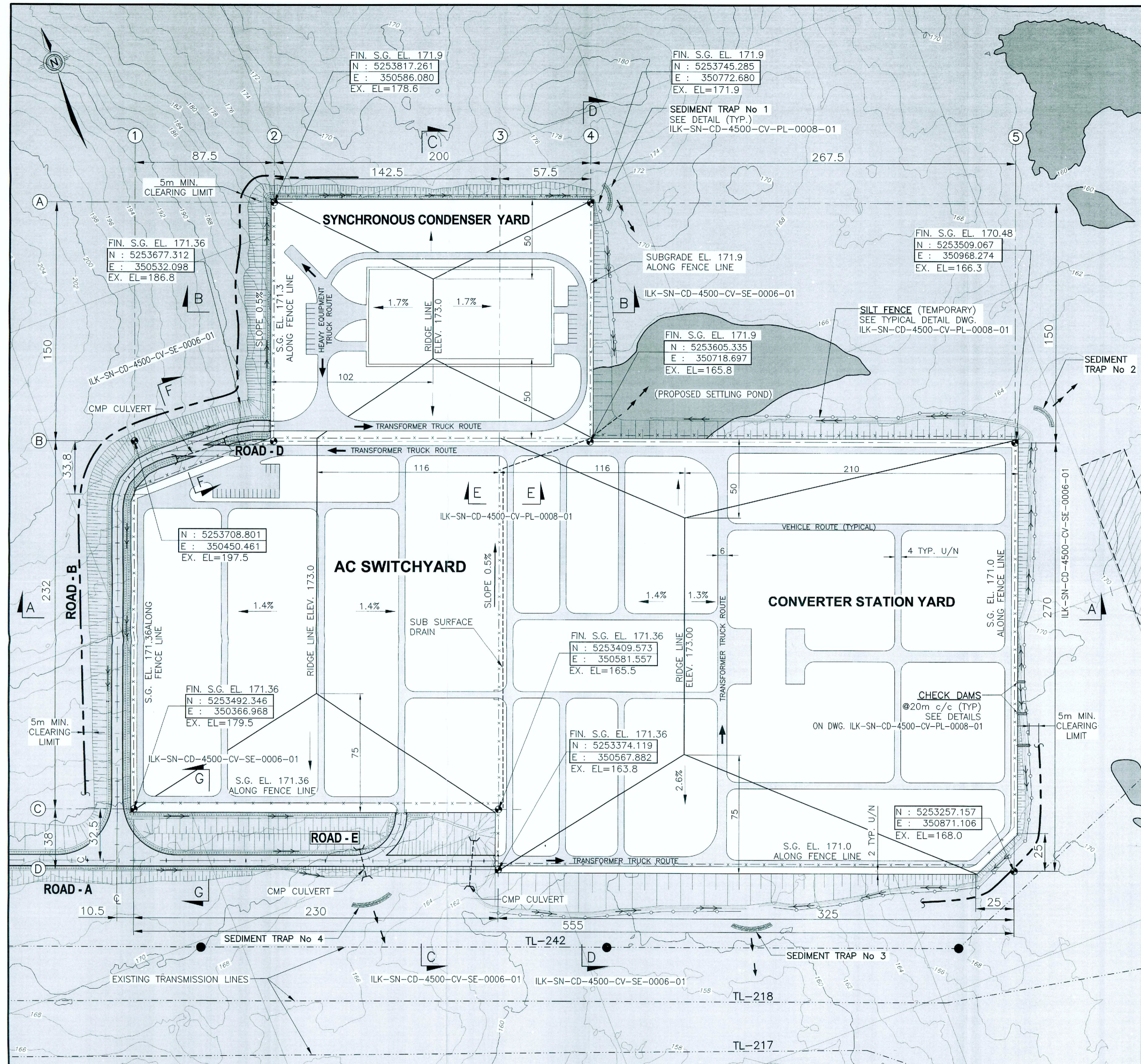
DESIGNED: R. WADHWA
DRAWN: S. BUIT/M.I. GARAVITO
VERIFIED: R. WADHWA
DATE: 15-MARCH-2012

APPROVED (Discipline Lead Engineer): AMV
APPROVED (Engineering Manager): *[Signature]*

PROJECT: LOWER CHURCHILL PROJECT
TITLE: SOLDIERS POND 230 KV SP SWITCHYARD AND CONVERTER STATION SITE GRADING AND LEVELING

SCALE: AS NOTED

BLI DOC No: 305573-4500-41DD-2050_08
NE DOC No: ILK-SN-CD-4500-CV-PL-0006-01



GENERAL NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH CONTRACT TECHNICAL SPECIFICATIONS AND AS SHOWN ON DRAWINGS.
2. COORDINATES SHOWN ARE PROJECT: UTM 22, METERS, DATUM NAD83 (CSRS). VERTICAL DATUM: CGG 2005 GEOD MODEL.
3. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES IN LOCATIONS, ELEVATIONS, GRADES OR DIMENSION BEFORE COMMENCEMENT OF ANY CONSTRUCTION.
4. CONTRACTOR SHALL ESTABLISH MINIMUM OF TWO (2) TEMPORARY BENCH MARKS AND HORIZONTAL CONTROL POINTS (INTERVISIBLE), LOCAL TO THE SITE, IN AREA THAT WILL NOT BE DISTURBED. CONTRACTOR SHALL USE LOCAL AREA CONTROL NETWORK ADJUSTED VALUES AS PER DWG. ILK-SN-CD-4500-CV-PL-0001-01 NOTE 4, TO ESTABLISH TEMPORARY BENCH MARKS.
5. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE GENERAL ENVIRONMENTAL REQUIREMENTS AS PER APPENDIX A OF THE TECHNICAL SPECIFICATION.
6. ALSO SEE NOTES ON OTHER DRAWINGS IN THIS CONTRACT.

CLEARING:

1. EXTENT OF CLEARING AREA SHALL BE AS PER TECHNICAL SPECIFICATION. HOWEVER, CLEARING SHALL NOT BE LESS THAN 5 METRES FROM BOTTOM OR TOP OF PROPOSED YARD EMBANKMENT AND SLOPE STABILIZATION AS APPLICABLE.
2. CLEARING MATERIAL SHALL BE DISPOSED OF AS PER TECHNICAL SPECIFICATION. NO BURNING IS ALLOWED AT SITE.

GRUBBING (STRIPPING):

1. EXTENT OF GRUBBING SHALL BE AS PER TECHNICAL SPECIFICATIONS. HOWEVER, GRUBBING SHALL NOT BE LESS THAN MAXIMUM WIDTH OF YARD EMBANKMENT.
2. ALL EROSION AND SEDIMENTATION CONTROLS SHALL BE INSTALLED AS INDICATED ON THE DRAWINGS PRIOR TO GRUBBING. TEMPORARY SILT FENCE TO BE MAINTAINED UNTIL THE DITCH IS INSTALLED. ANY SILT ACCUMULATED SHALL BE DISPOSED OF APPROPRIATELY.
3. GRUBBING (STRIPPING) SHALL CONSIST OF THE REMOVAL OF ALL STUMPS, ROOTS, DEBRIS, ORGANIC AND ALL OTHER MATERIALS, UP TO AN APPROXIMATE AVERAGE DEPTH OF 100mm. NO BURNING IS ALLOWED AT SITE.
4. GRUBBING (STRIPPING) AND TOPSOIL MATERIAL SHALL BE STOCKPILED AT SITE IN AREAS AS DESIGNATED BY ENGINEER AND RE-USE FOR SITE REHABILITATION AS REQUIRED.

WEATHERED TILL:

1. TEST PITS COMPLETED FOR THE WORK SITE INDICATE THAT APPROXIMATELY 300 mm DEPTH OF MATERIAL BEYOND THE SPECIFIED GRUBBING DEPTH CONSIST OF WEATHERED TILL AND ORGANICS.
2. WEATHERED TILL MATERIAL SHALL BE EXCAVATED AND STOCKPILED TO BE USED WITH ROCK FILL FOR SITE PREPARATION AS SHOWN ON DRAWING OR AS DIRECTED BY ENGINEER.

EXCAVATION (COMMON AND ROCK):

1. EXTENT OF COMMON EXCAVATION SHALL BE MIN. 5 METRES BEYOND THE FENCE LINES SHOWN ON DRAWINGS OR AS REQUIRED BY ENGINEER.
2. EXCAVATION SHALL CONSIST OF THE REMOVAL OF ALL COMMON MATERIAL TO THE LINES AND GRADE AS SHOWN ON DRAWINGS.
3. TEST PITS COMPLETED FOR THE WORKSITES INDICATE THAT THERE WILL BE ROCK ENCOUNTERED DURING EXCAVATION TO THE DEPTH SPECIFIED ON THE DRAWINGS IN CERTAIN AREAS. INFORMATION ON THE TYPE OF SOIL GROUND WATER DEPTH AND ROCK LOCATION IS PROVIDED IN ATTACHED GEOTECHNICAL REPORT.
4. CONTRACTOR SHALL VERIFY EXCAVATION QUANTITIES WITH AREA SURVEY PRIOR TO AND AFTER EXCAVATION. GRID SIZE SHALL BE 5 m x 5 m, OR AS AGREED BETWEEN CONTRACTOR AND ENGINEER.
5. BLASTING SHALL BE CARRIED OUT AS PER TECHNICAL SPECIFICATION.

PLACEMENT OF FILL (COMMON AND ROCK):

1. ALL EXCAVATED AREAS SHALL BE KEPT FREE OF WATER TO THE SATISFACTION OF ENGINEER. EXCAVATED COMMON/ROCK MATERIAL SHALL BE USED ONSITE FOR FILL, YARD EMBANKMENT OR SIMILAR CONSTRUCTION. IT IS ANTICIPATED THAT ALMOST ALL OF EXCAVATED COMMON/ROCK SUITABLE MATERIAL GENERATED CAN BE REUSED AS FILL FOR SITE PREPARATION WORK. SUITABLE MATERIAL NOT USED IMMEDIATELY IN THE WORK SHALL BE STOCKPILED IN AREA DESIGNATED BY THE ENGINEER AT NO ADDITIONAL COST TO THE COMPANY FOR SUBSEQUENT USE IN THE WORK.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR TESTING AND CONFORMING THE SUITABILITY OF THE EXCAVATED MATERIAL AS COMMON FILL AND ROCKFILL FOR SITE PREPARATION AS SHOWN ON DRAWINGS AND IN ACCORDANCE WITH TECHNICAL SPECIFICATION. CONTRACTOR SHALL ADVISE ENGINEER OF ANY NON-CONFORMITY OF THE EXCAVATED MATERIAL AND THE MEASURES TO BE TAKEN TO MEET THE REQUIREMENT.

PLACEMENT OF GRANULAR FILL:

1. GRANULAR FILL SHALL BE WELL GRADED MATERIAL AS PER SPECIFICATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR TESTING AND CONFORMING THE SUITABILITY OF THE EXCAVATED MATERIAL AS GRANULAR FILL. SHOULD THERE BE A NEED OF BORROW FILL THEN CONTRACTOR SHALL LOCATE THE BORROW PIT AND OBTAIN ENGINEER'S APPROVAL PRIOR TO ITS USE. CONTRACTOR SHALL BE RESPONSIBLE FOR PERMITS AND APPROVAL TO USE THE SITE.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUPPLY, DELIVERY, PLACEMENT AND COMPACTION OF GRANULAR MATERIAL FOR THE COMPLETION OF SITE WORK.
3. CONTRACTOR SHALL STOCKPILE MATERIAL ON AREA DESIGNATED BY ENGINEER IN A MANNER TO PREVENT SEGREGATION.
4. MATERIAL SHALL BE PLACED AND SPREAD IN LIFTS AS SPECIFIED.

SUBGRADE SLOPES:

1. CONTRACTOR SHALL CHECK THE GRADES AND ELEVATIONS THROUGHOUT THE YARD AS SHOWN ON DRAWINGS. PROPOSED GRADES AND DRAINAGE LAYOUT MAY CHANGE TO SUIT SITE CONDITIONS, AS APPROVED BY ENGINEER.

ACCESS ROAD:

1. NEW ACCESS ROAD SHALL BE USED FOR CONSTRUCTION OF YARD AND TRANSPORTATION OF HEAVY EQUIPMENT TO THE YARDS. THE EXTENT OF NEW ACCESS ROAD SHALL BE FROM TRANS CANADA HIGHWAY TO SWITCHYARD GATES, TO CONVERTER YARD AND TO SYNCHRONOUS CONDENSER YARD GATE.
2. THE EQUIPMENT LOAD TO BE TRANSPORTED ON THIS ACCESS ROAD COULD BE IN THE ORDER OF 200 TONS.
3. ACCESS ROAD LAYOUT SHOWN IS CONCEPTUAL AND FOR INFORMATION ONLY. CONTRACTOR SHALL DESIGN AND BUILD THE PROPOSED ACCESS ROAD WITH APPROVAL BY THE ENGINEER. ANY CHANGES TO THE PROPOSED LAYOUT SHALL BE REVIEWED WITH ENGINEER. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ENVIRONMENTAL PROTECTION ASPECTS OF ACCESS ROAD (i.e. EROSION AND SILTATION CONTROLS).
4. ACCESS ROAD SHALL BE BUILT AS PER CANADIAN ROAD GEOMETRIC DESIGN 2011 AND DEPARTMENT OF TRANSPORTATION AND WORKS, GOVT. OF NEWFOUNDLAND AND LABRADOR.
5. THE GRADE OF ACCESS ROAD SHALL NOT EXCEED 6%.
6. THE TURNING RADIUS SHALL BE ALONG THE ACCESS ROAD AS REQUIRED BY DESIGN AND BY STANDARDS, WHICHEVER IS CONSERVATIVE.

ROAD DRAINAGE:

1. ALL CULVERTS OUTSIDE THE SUBSTATION SHALL BE PART OF ACCESS ROAD AND SHALL BE DESIGNED BY THE CONTRACTOR. DIAMETER OF CULVERT SHALL NOT BE LESS THAN 800 mm.
2. CULVERT REQUIRED OUTSIDE THE YARD SHALL BE INSTALLED TO THE STANDARD OF NL DEPARTMENT OF TRANSPORTATION AND WORKS.
3. ALL CULVERT ENDS SHALL BE PROTECTED WITH RIP RAP AS SHOWN ON DRAWINGS.
4. PERMANENT DITCHES, CHECK DAMS IN THE DITCH SHALL BE BUILT AS SHOWN ON DRAWING. ROUTING OF DITCHES MAY CHANGE TO SUIT SITE CONDITIONS.

POWER SUPPLY:

1. CONTRACTOR SHALL PROVIDE ITS OWN CONSTRUCTION POWER.

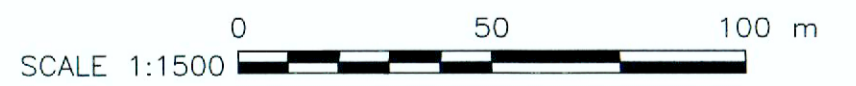
SITE WATER MANAGEMENT:

1. SEE DWG. ILK-SN-CD-4500-CV-PL-0008-01, FOR DETAILS OF SEDIMENT TRAP. ORIENTATION/LOCATION OF SEDIMENT DAM MAY CHANGE TO SUIT SITE CONDITIONS.
2. LOCATION, SPACING AND DETAILS FOR SEDIMENTS TRAPS, CHECK DAM AND SILT FENCE SHALL BE TYPICAL FOR ALL AROUND THE PROPOSED SUBSTATION YARD MAY CHANGE TO SUIT SITE CONDITIONS

LEGEND:

FIN. S.G. EL. 170.4	FINISHED SUBGRADE ELEVATION (METERS)	-x-x-	SWITCHYARD FENCE
N: 5253000 E: 3500004	COORDINATES (IN METERS)	- - - -	DITCH SLOPE DIRECTION
EL. 190.00	EXISTING GRADING ELEVATION (METERS)		SUBSURFACE DRAIN
●	LOCATION POINTS (AT FENCE CORNER OR AXIS INTERSECTION)	—	SLOPE DIRECTION
-180-	CONTOURS @ 2m INTERVAL ELEVATION IN METRES	---	CLEARING LIMIT
---	SILT FENCE (TEMPORARY)		
- - - -	CULVERT		
	EDGE OF SLOPE		

SITE PLAN SCALE: 1 : 1500



PROVINCE OF NEWFOUNDLAND PERMIT HOLDER CLASS "A" This Permit Allows SNC-LAVALIN Inc. To practice Professional Engineering in Newfoundland and Labrador. Permit No. as issued by PEGNL N0458 which is valid for the year 2013.

ISSUE	REV.	DATE	DISTRIBUTION & STATUS
3	C3	18-DEC-2013	RE-ISSUED FOR CONSTRUCTION
2	C2	28-SEP-2013	RE-ISSUED FOR CONSTRUCTION
1	C1	22-AUG-2013	ISSUED FOR CONSTRUCTION

No.	DATE	REVISION	MOD.	VER.	APP.
2	18-DEC-2013	ALL SUI REF. NUMBERS REMOVED, GENERAL NOTES REVISED AS MARKED			
1	28-SEP-2013	REFERENCE DWG NO. REVISED			

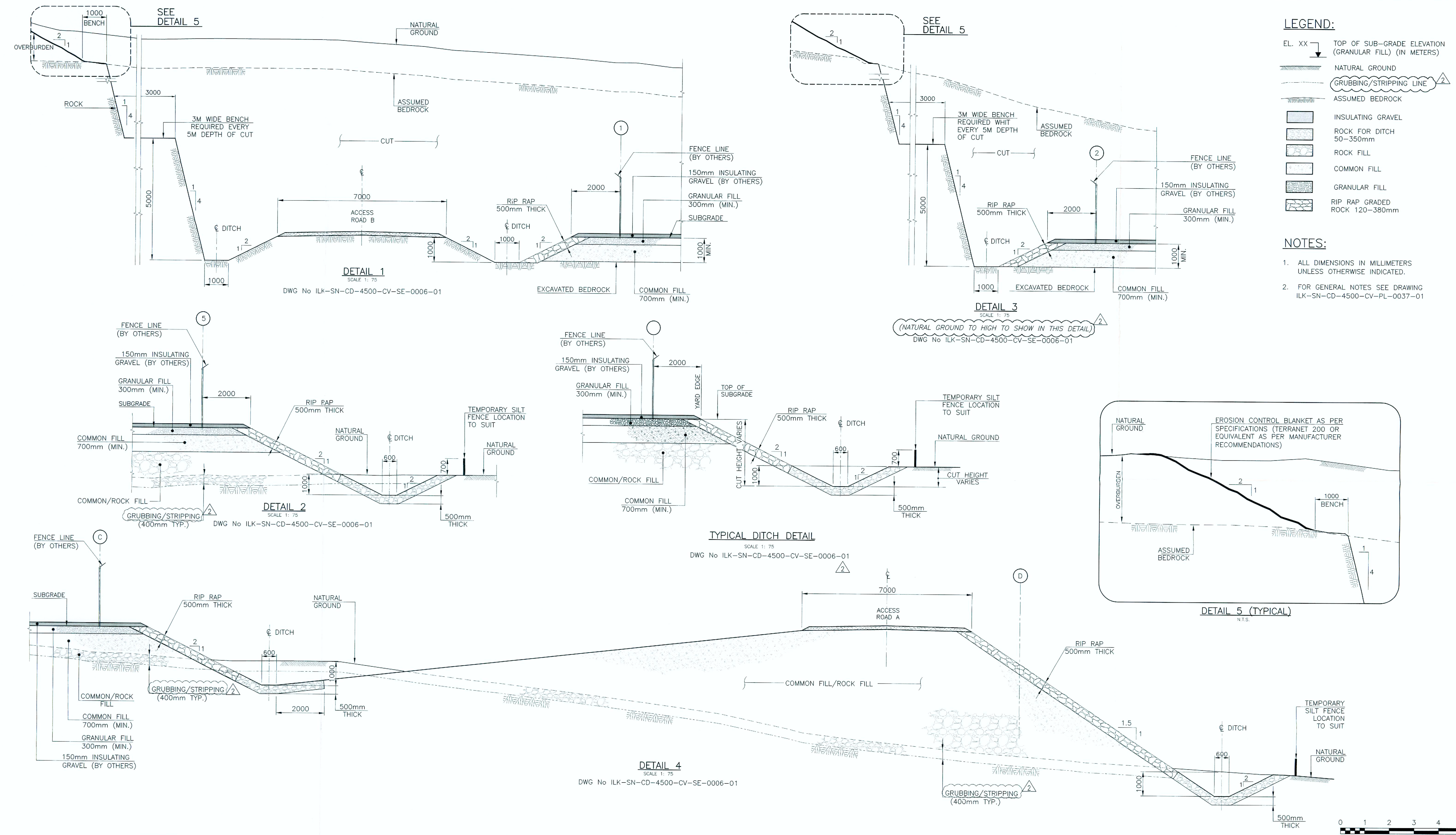
REVIEW CLASS:	EQUIPMENT TAG NUMBER:
REVIEW DOES NOT CONSTITUTE APPROVAL OF DESIGN DETAILS, CALCULATIONS, TEST METHODS OR MATERIAL DEVELOPED AND/OR SELECTED BY THE CONTRACTOR. NOR DOES IT RELIEVE THE CONTRACTOR FROM FULL COMPLIANCE WITH CONTRACTUAL OR OTHER OBLIGATIONS.	
1. REVIEWED AND ACCEPTED NO COMMENTS	
2. REVIEWED - INCORPORATE COMMENTS, REVISE & RESUBMIT	
3. REVIEWED - NOT ACCEPTED	
4. INFORMATION ONLY	
5. NOT REVIEWED	

PROFESSIONAL STAMP
 R. S. WADHWIA
 19 DEC 2013
 PROVINCE OF NEWFOUNDLAND

SNC-LAVALIN
 DESIGNED: R. WADHWIA
 DRAWN: M. MICHAUD / M. T. GRAVITO
 VERIFIED: R. WADHWIA
 DATE: 15-MARCH-2012
 SCALE: 1:1500

CLIENT: nalcor
 PROJECT: LOWER CHURCHILL PROJECT
 TITLE: SOLDIERS POND 230 kV SP SUBSTATION SITE GRADING AND LEVELING
 NE DOC No. 505573-4500-41DD-2051_09
 ILK-SN-CD-4500-CV-PL-0037-01

Z:\Proj\505573 Lower Churchill\WBS 4000 Area Substations\CD503 Substation Earthworks\40-Engineering\41-Civil\41DD-Drawings\Soldiers 505573-4500-41DD-2051_09.DWG



- LEGEND:**
- EL. XX TOP OF SUB-GRADE ELEVATION (GRANULAR FILL) (IN METERS)
 - NATURAL GROUND
 - GRUBBING/STRIPPING LINE
 - ASSUMED BEDROCK
 - INSULATING GRAVEL
 - ROCK FOR DITCH 50-350mm
 - ROCK FILL
 - COMMON FILL
 - GRANULAR FILL
 - RIP RAP GRADED ROCK 120-380mm

- NOTES:**
1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE INDICATED.
 2. FOR GENERAL NOTES SEE DRAWING ILK-SN-CD-4500-CV-PL-0037-01

Z:\Proj\505573 Lower Churchill\WBS 4000 Area Substations\CD503 Substation Earthworks\40-Engineering\41-Civil\41DD-Drawings\Soldiers Pond.dwg

PROVINCE OF NEWFOUNDLAND
PERMIT HOLDER CLASS "A"
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SNC-LAVALIN Inc.
 To practice Professional Engineering in Newfoundland and Labrador. Permit No. as issued by PEGNL N0458 which is valid for the year 2013.

ISSUE	REV.	DATE	DISTRIBUTION & STATUS	REFERENCE DRAWING
3	C3	16-DEC-2013	RE-ISSUED FOR CONSTRUCTION	
2	C2	28-SEP-2013	RE-ISSUED FOR CONSTRUCTION	
1	C1	22-AUG-2013	ISSUED FOR CONSTRUCTION	ILK-SN-CD-4500-CV-SE-0006-01 230 kV SP SUBSTATION EARTHWORKS #1 SECTIONS A-A, B-B, C-C AND D-D SOLDIERS POND 230 kV SP SUBSTATION SITE GRADING AND LEVELING

No.	DATE	REVISION	MOD.	VER.	APP.
2	16-DEC-2013	ALL SLI REF. DWG NUMBERS REMOVED, DETAIL 3 AND RIP RAP DETAILS CLARIFIED, MODIFICATIONS AS MARKED			
1	26-SEP-2013	REFERENCE DWG No. REVISED			

PROFESSIONAL STAMP
R. S. WADHWA
 19 DEC 2013
 PROVINCE OF NEWFOUNDLAND

SNC-LAVALIN

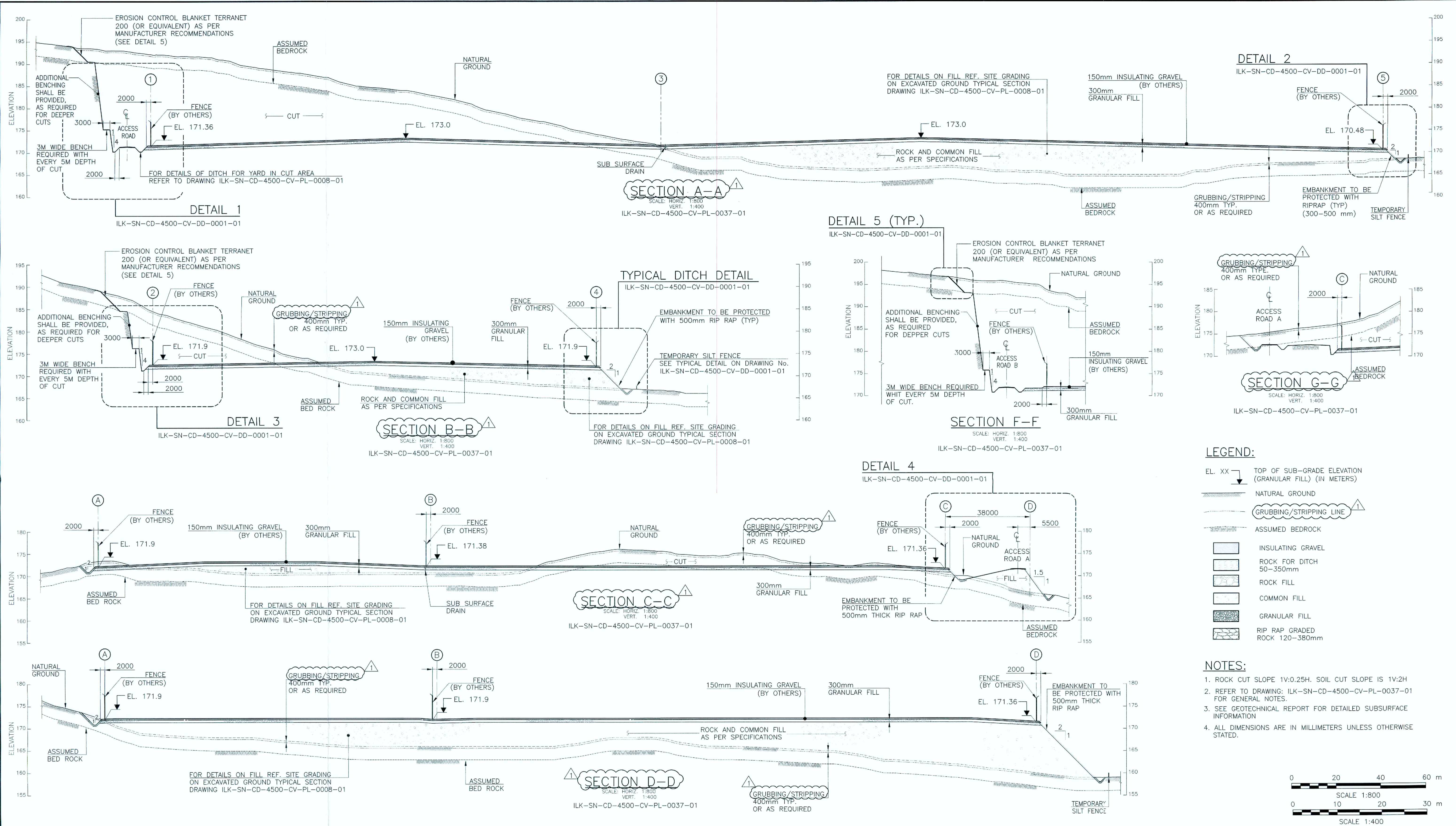
DESIGNED: R. WADHWA
 DRAWN: M.T. GARAVITO
 VERIFIED: R. WADHWA
 DATE: 15-MARCH-2013

APPROVED (Discipline Lead Engineer): ANV
 APPROVED (Engineering Manager): [Signature]

PROJECT: LOWER CHURCHILL PROJECT
 TITLE: SOLDIERS POND 230 kV SP SUBSTATION SITE GRADING AND LEVELING DETAILS

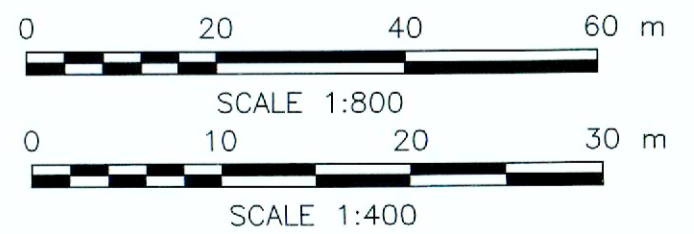
SCALE: AS NOTED

SLI DOC No. 505573-4500-41DD-2052-09
 NE DOC No. ILK-SN-CD-4500-CV-DD-0001-01
 Rev. C3



- LEGEND:**
- EL. XX → TOP OF SUB-GRADE ELEVATION (GRANULAR FILL) (IN METERS)
 - NATURAL GROUND
 - GRUBBING/STRIPPING LINE
 - ASSUMED BEDROCK
 - INSULATING GRAVEL
 - ROCK FOR DITCH 50-350mm
 - ROCK FILL
 - COMMON FILL
 - GRANULAR FILL
 - RIP RAP GRADED ROCK 120-380mm

- NOTES:**
- ROCK CUT SLOPE 1V:0.25H. SOIL CUT SLOPE IS 1V:2H
 - REFER TO DRAWING: ILK-SN-CD-4500-CV-PL-0037-01 FOR GENERAL NOTES.
 - SEE GEOTECHNICAL REPORT FOR DETAILED SUBSURFACE INFORMATION
 - ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.



PROVINCE OF NEWFOUNDLAND
PERMIT HOLDER
CLASS "A"
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To practice Professional Engineering in Newfoundland and Labrador. Permit no. as issued by PEGNI, N0458 which is valid for the year 2013.

ISSUE	REV.	DATE	DISTRIBUTION & STATUS	No.	REFERENCE DRAWING
2	C2	16-DEC-2013	RE-ISSUED FOR CONSTRUCTION	ILK-SN-CD-4500-CV-PL-0008-01	230 kV SP SUBSTATION SITE GRADING AND LEVELLING SECTIONS AND DETAILS
1	C1	22-AUG-2013	ISSUED FOR CONSTRUCTION	ILK-SN-CD-4500-CV-DD-0001-01	230 kV SP SUBSTATION SITE GRADING AND LEVELLING DETAILS
1	1	16-DEC-2013	DISTRIBUTION & STATUS	ILK-SN-CD-4500-CV-PL-0037-01	230 kV SP SUBSTATION SITE GRADING AND LEVELLING

No.	DATE	REVISION	MOD.	VER.	APP.
1	16-DEC-2013	ALL SU REF. DWG NUMBERS REMOVED AND SEC. A-A, B-B, C-C, D-D & G-G CLARIFIED			

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REVIEW CLASS: EQUIPMENT TAG NUMBER:

REVIEW DOES NOT CONSTITUTE APPROVAL OF DESIGN DETAILS, CALCULATIONS, TEST METHODS OR MATERIAL DEVELOPED AND/OR SELECTED BY THE CONTRACTOR, NOR DOES IT RELIEVE THE CONTRACTOR FROM FULL COMPLIANCE WITH CONTRACTUAL OR OTHER OBLIGATIONS.

1. REVIEWED AND ACCEPTED NO COMMENTS
 2. REVIEWED - INCORPORATE COMMENTS, REVISE & RESUBMIT
 3. REVIEWED - NOT ACCEPTED
 4. INFORMATION ONLY
 5. NOT REVIEWED

LEAD REVIEWER: [Signature] Date (dd-mm-yyyy): 23-12-2014

NE-LCP MANAGEMENT: [Signature] Date (dd-mm-yyyy): 29-Jan-2014

PROJECT MANAGER: [Signature] Date (dd-mm-yyyy): 29-Jan-2014

PROFESSIONAL STAMP
REGISTRED PROFESSIONAL ENGINEER
M. S. WADHWA
19-DEC-2013
PROVINCE OF NEWFOUNDLAND

SNC-LAVALIN

DESIGNED: R. WADHWA
DRAWN: S. BUTT/M.T. GARAVITO
VERIFIED: R. WADHWA
DATE: 15-MARCH-2012
SCALE: HORIZ. : 1 : 800 VERT. : 1 : 400

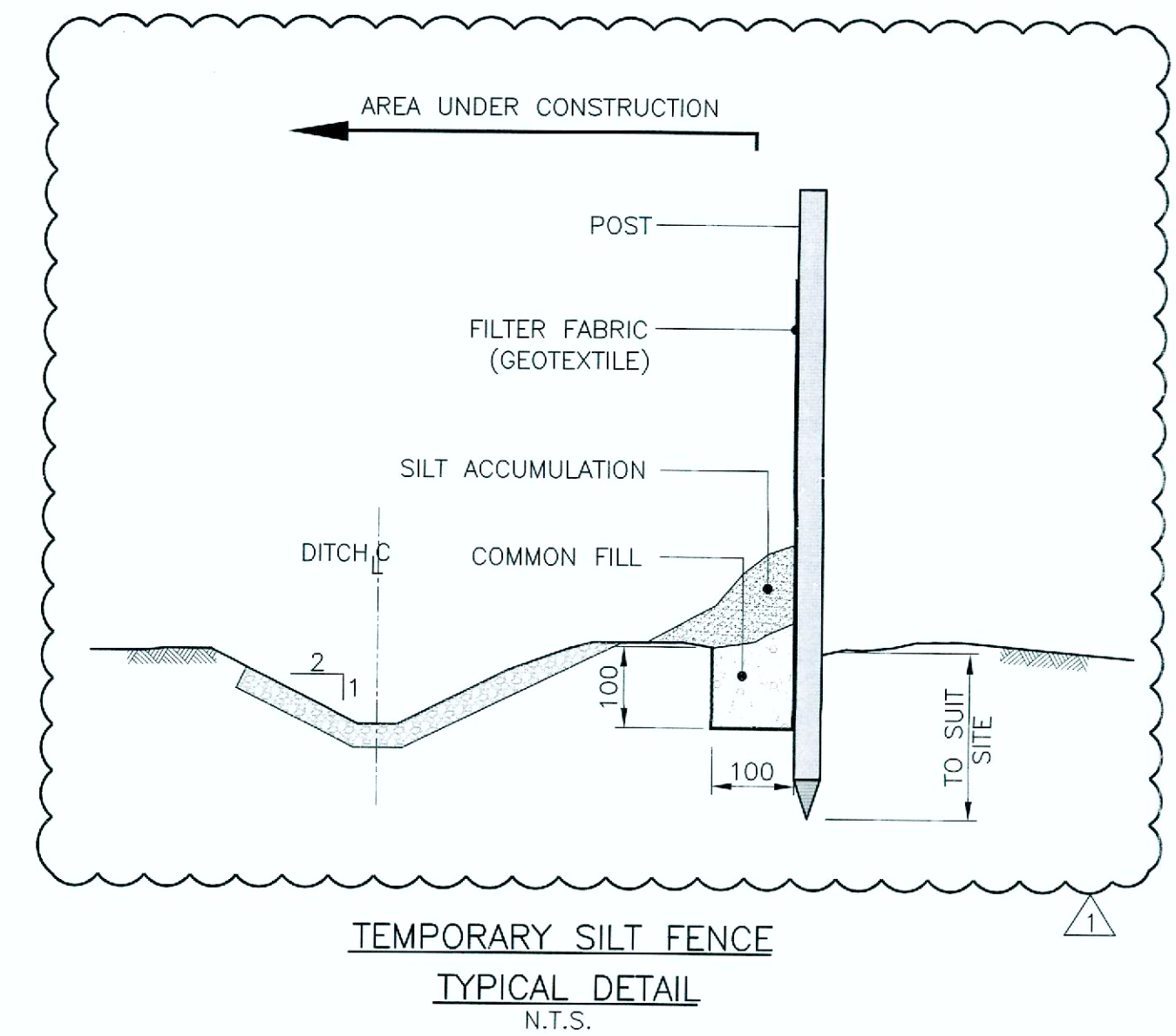
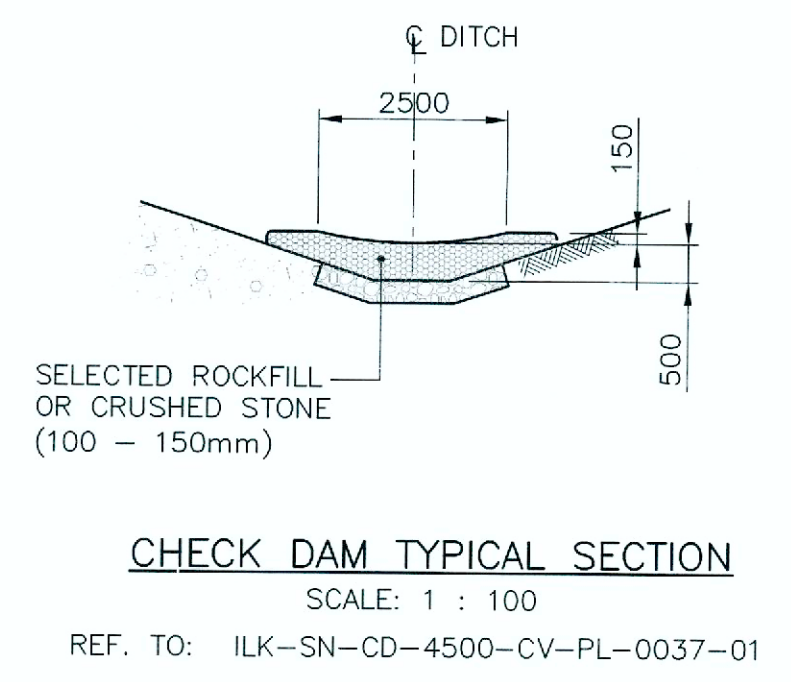
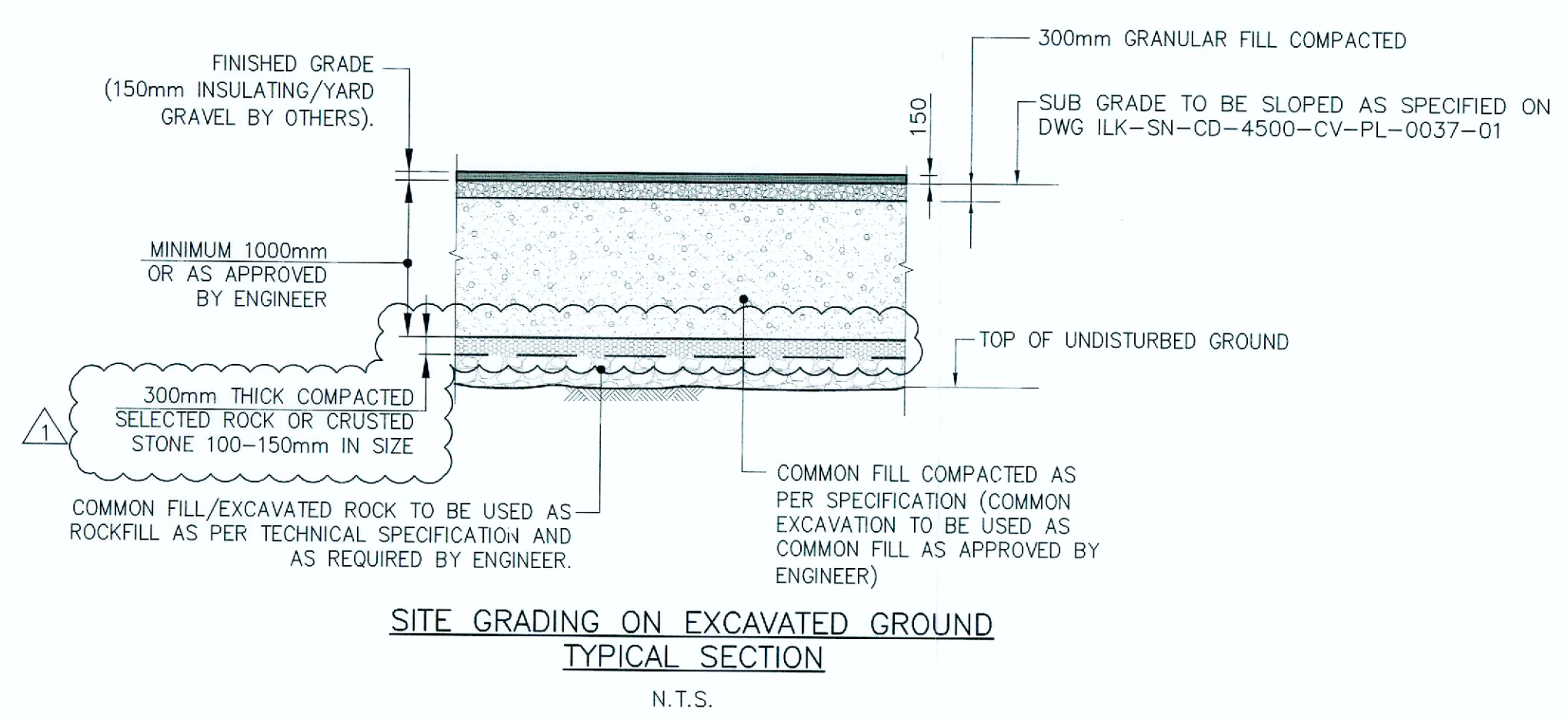
APPROVED (Discipline Lead Engineer): [Signature]
APPROVED (Engineering Manager): [Signature]

CLIENT: **nalcor**
LOWER CHURCHILL PROJECT

PROJECT: LOWER CHURCHILL PROJECT
TITLE: SOLDIERS POND
230 kV SP SUBSTATION
SUBSTATION EARTHWORKS #1
(SECTIONS A-A, B-B, C-C, AND D-D)

SLI DOC No. 505573-4500-41-DD-2060-07
NE DOC No. ILK-SN-CD-4500-CV-SE-0006-01
Rev. C2

Z:\A Proj\505573_Lower_Churchill\WBS_4000_Area_Substations_CD503_Substation_Earthworks_41-Civil\41-DD-Drawings\Soldiers Pond\505573-4500-41-DD-2060-07.DWG 2013.12.19/3:52pm

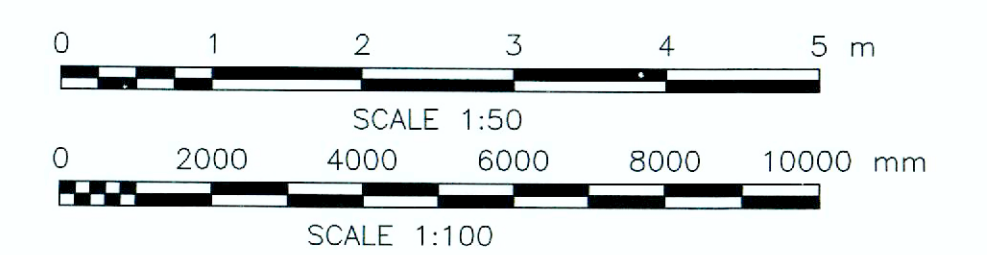
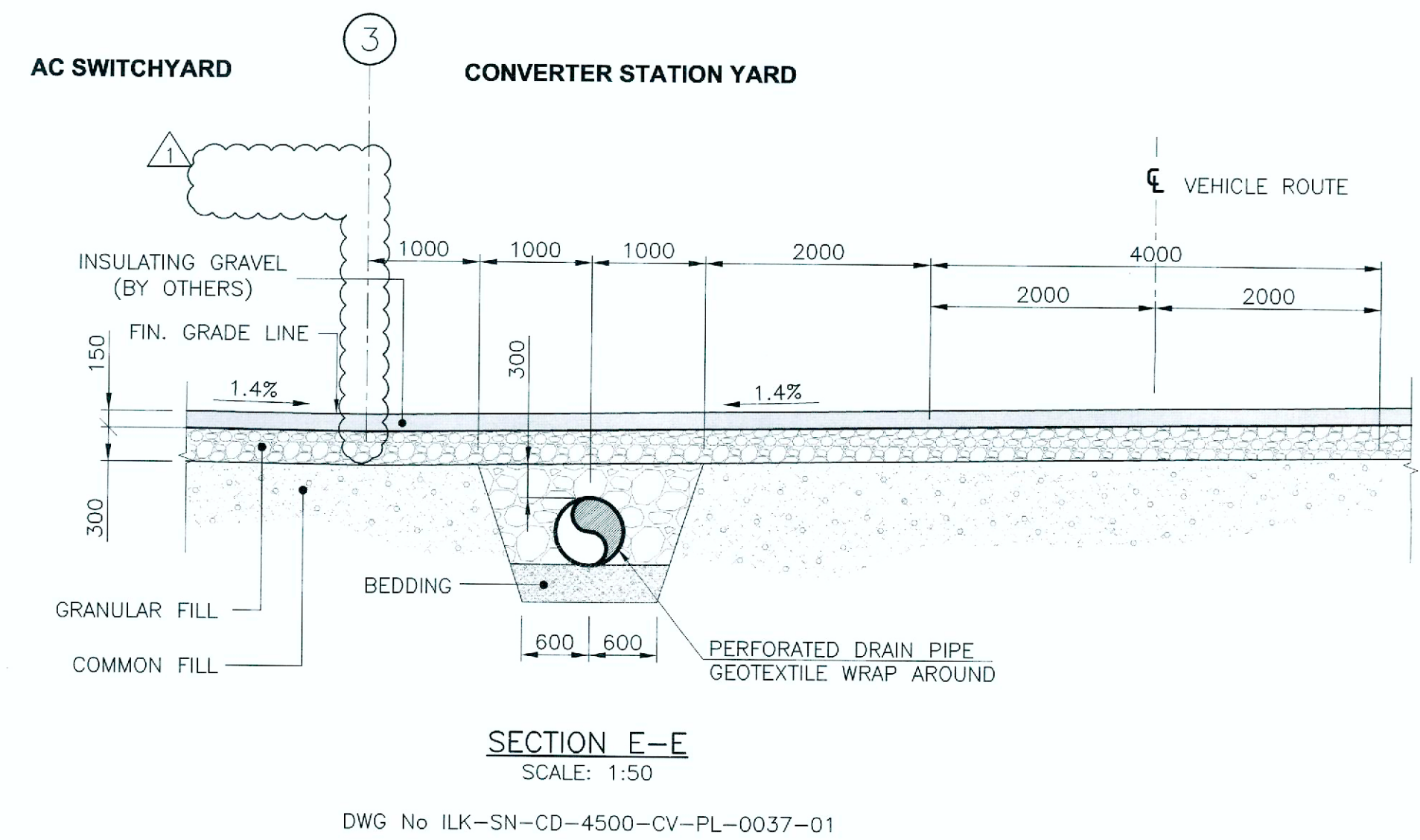
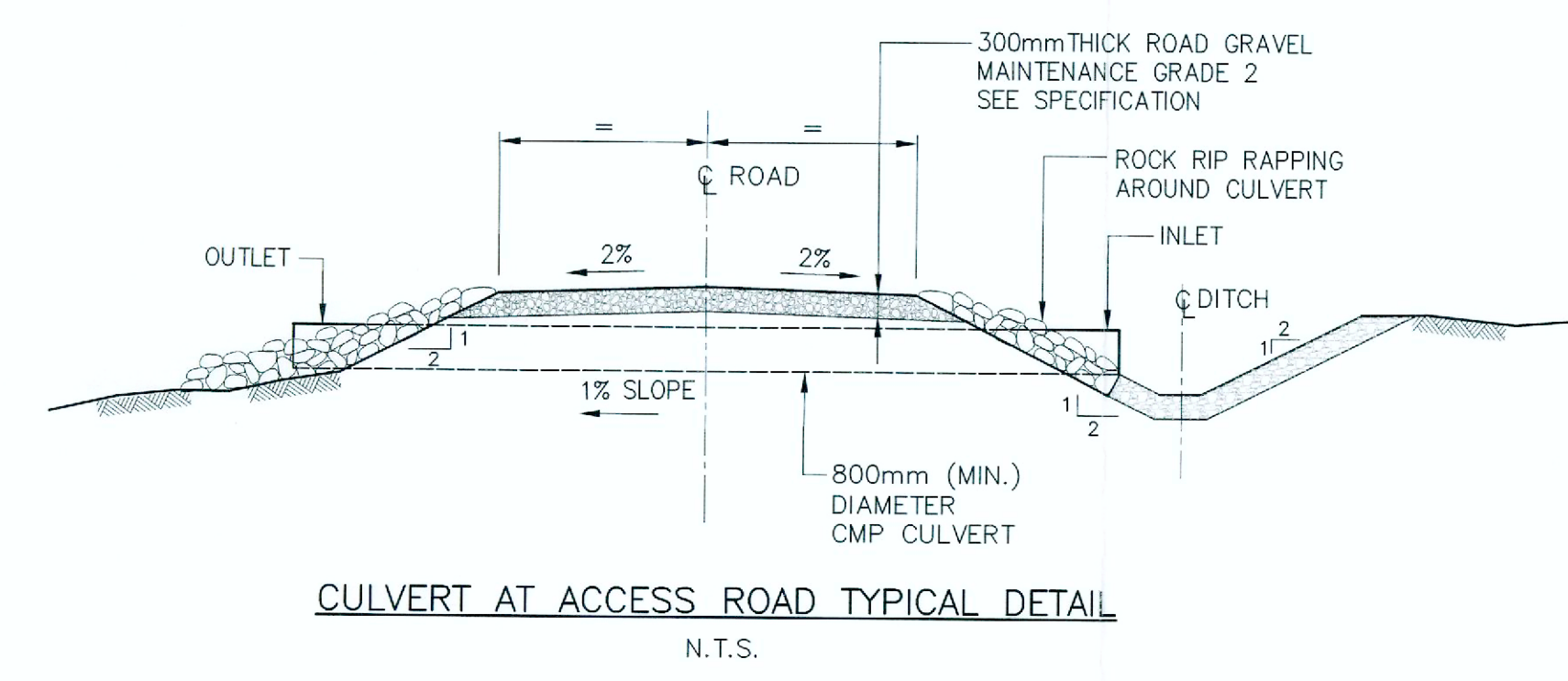
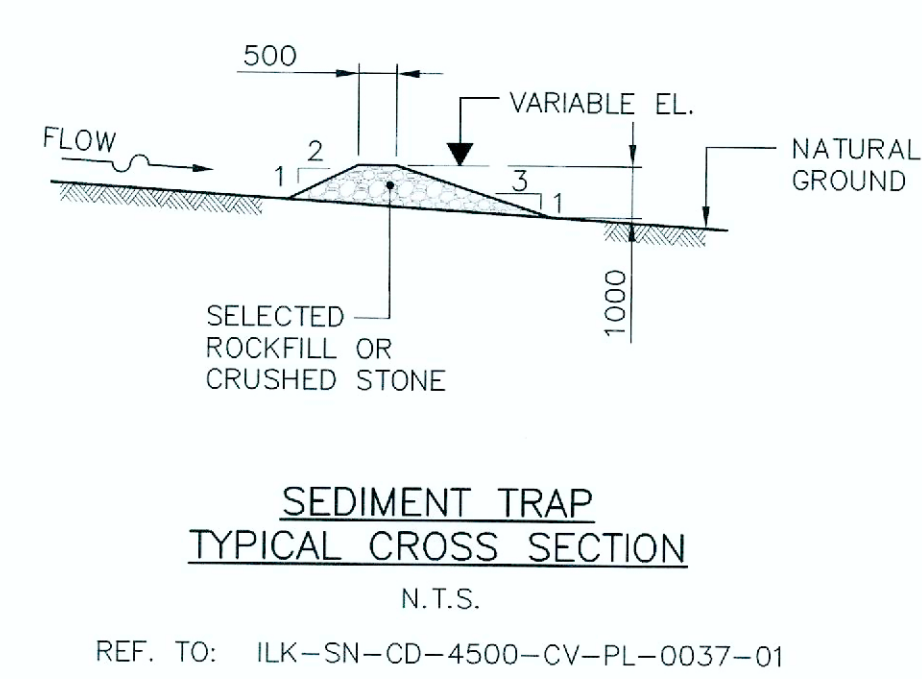
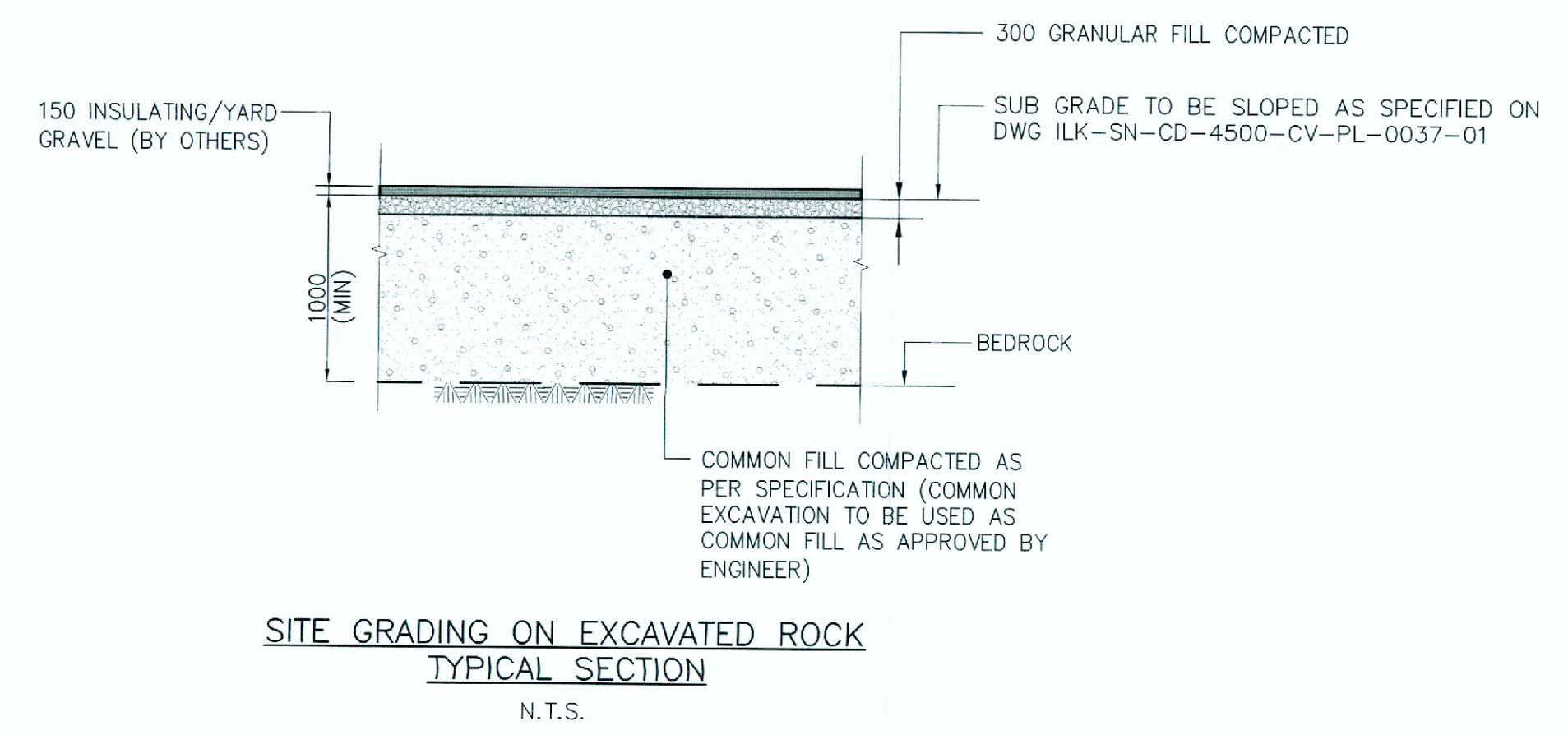


- NOTES:**
- FOR GENERAL NOTE, SEE DRAWING ILK-SN-CD-4500-CV-PL-0037-01
 - THIS DRAWING IS FOR INFORMATION PURPOSE ONLY. DETAILS MAY CHANGE TO SUIT SITE CONDITIONS CONTRACTOR SHALL SUBMIT REVISED DETAILS FOR ENGINEERS APPROVAL.

NOTES FOR INSTALLATION OF GEOTEXTILE SILT FENCE:

- SILT FENCE SHALL BE INSTALLED AT LOCATION SHOWN ON DRAWING ILK-SN-CD-4100-CV-PL-0037-01
- DRIVE STURDY STAKES, SPACED MINIMUM 3000mm APART IN TO THE GROUND ALONG THE DOWNSLOPE SIDE OF THE TRENCH
- INSTALL THE FILTER FABRIC FROM A CONTINUOUS ROLL AND CUT TO REQUIRED LENGTH. THE FILTER FABRIC SHOULD BE STAPLED TO THE UPSTREAM SIDE OF THE STAKES, EXTENDING THE BOTTOM 200mm INTO THE TRENCH
- BACKFILL AND COMPACT THE SOIL IN THE TRENCH OVER THE FILTER FABRIC.
- FOR SEDIMENT TRAP EXCAVATE A 10m X 10m X 1m HIGH ABOVE EXISTING GROUND IN A CRESCENT SHAPE ACROSS THE FLOW WITH ENDS POINTING UP SLOPE, OR AS APPROVED BY ENGINEER.

- LEGEND:**
- EL. XX TOP OF SUB-GRADE ELEVATION (GRANULAR FILL) (IN METERS)
 - EXISTING GRADE
 - GRUBBING/STRIPPING LINE
 - ASSUMED BEDROCK
 - INSULATING GRAVEL
 - ROCK FOR DITCH 50-350mm
 - ROCK FILL
 - COMMON FILL
 - GRANULAR FILL
 - RIP RAP GRADED ROCK 120-380
 - SELECTED ROCKFILL OR CRUSHED STONE (100 - 150mm)
 - SILT
 - BEDDING



PROVINCE OF NEWFOUNDLAND PERMIT HOLDER CLASS "A" This Permit Allows SNC-LAVALIN inc. To practice Professional Engineering in Newfoundland and Labrador. Permit No. as issued by PEGNL N0458 which is valid for the year 2013.

ISSUE	REV.	DATE	DISTRIBUTION & STATUS	REFERENCE DRAWING
2	C2	18-DEC-2013	RE-ISSUED FOR CONSTRUCTION	
1	C1	22-AUG-2013	ISSUED FOR CONSTRUCTION	ILK-SN-CD-4500-CV-PL-0037-01
				ILK-SN-CD-4500-CV-00-0001-01

No.	DATE	REVISION	MOD.	VER.	APP.
1	18-DEC-2013	ALL 'SU' REF. DWG. NUMBERS REMOVED, TYP. SEC. FOR EXCAVATED GROUND, SILT FENCE, SECTION E-E REVISED AND RIP RAP CLARIFIED.			

FOR INTERNAL USE ONLY

REVIEW CLASS: EQUIPMENT TAG NUMBER:

REVIEW DOES NOT CONSTITUTE APPROVAL OF DESIGN DETAILS, CALCULATIONS, TEST METHODS OR MATERIAL DEVELOPED AND/OR SELECTED BY THE CONTRACTOR, NOR DOES IT RELIEVE THE CONTRACTOR FROM FULL COMPLIANCE WITH CONTRACTUAL OR OTHER OBLIGATIONS.

1. REVIEWED AND ACCEPTED - NO COMMENTS

2. REVIEWED - INCORPORATE COMMENTS, REVISE & RESUBMIT

3. REVIEWED - NOT ACCEPTED

4. INFORMATION ONLY

5. NOT REVIEWED

LEAD REVIEWER: *[Signature]* Date (dd-mm-yyyy): 23-Jan-2014

NE-LCP MANAGEMENT: *[Signature]* Date (dd-mm-yyyy): 24-Jan-2014

PROJECT MANAGER: *[Signature]* Date (dd-mm-yyyy): 24-Jan-2014

PROFESSIONAL STAMP

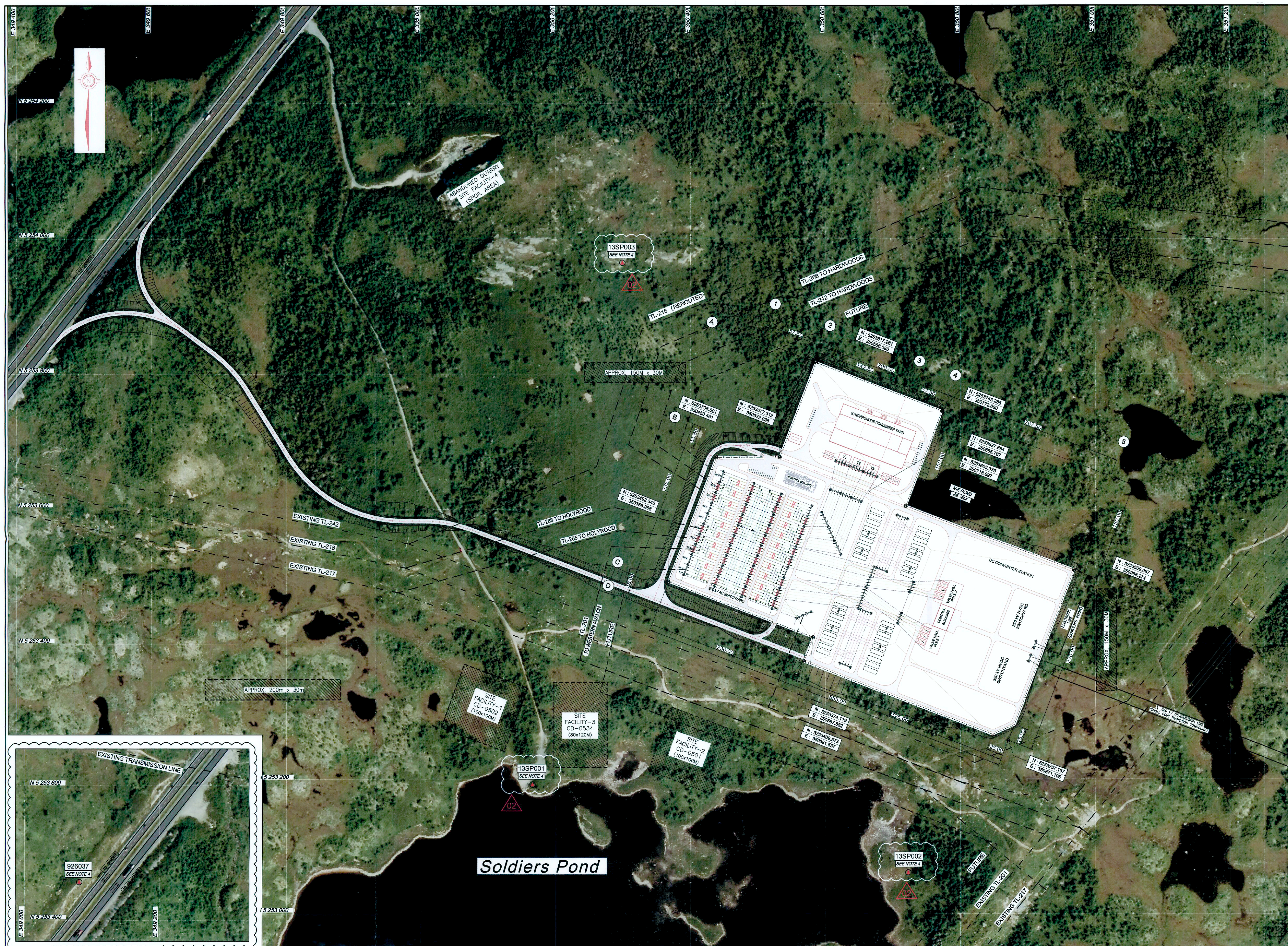
R. WADHWA

REG. NO. 19 DEC 2013

PROVINCE OF NEWFOUNDLAND

DESIGNED: R. WADHWA	APPROVED (Discipline Lead Engineer): <i>[Signature]</i>	PROJECT: LOWER CHURCHILL PROJECT
DRAWN: M. MICHAUD/M.T. GARAVITO	APPROVED (Engineering Manager): <i>[Signature]</i>	TITLE: SOLDIERS POND 230 kV SP SUBSTATION EARTHWORKS #2 (SECTIONS)
VERIFIED: A. VILLARAZA		
DATE: 24-JAN-2012	SCALE: AS NOTED	
SLI DOC No. 505573-4500-41DD-2061_07	NE DOC No. ILK-SN-CD-4500-CV-PL-0008--01	Rev. C2

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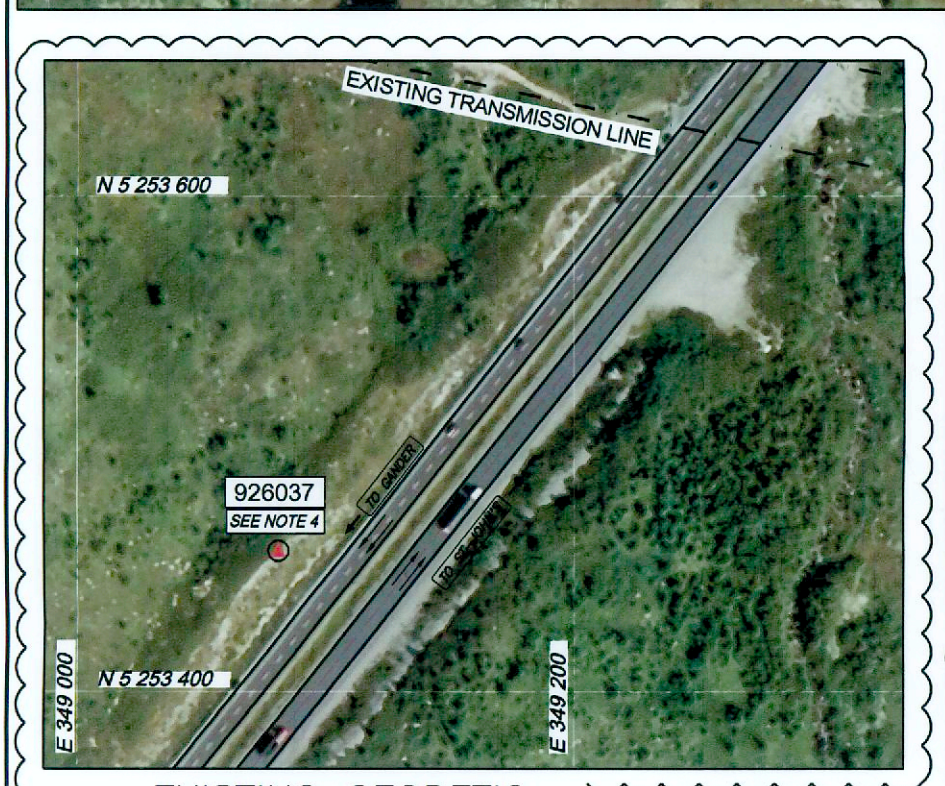
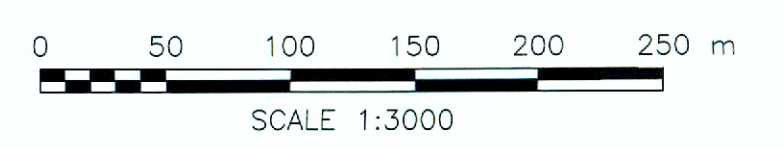
- LEGEND:**
- NEW TRANSMISSION LINE
 - - - FUTURE TRANSMISSION LINE
 - - - EXISTING TRANSMISSION LINE

- NOTES:**
1. THIS DRAWING IS A CONCEPTUAL DESIGN AND INTENDED TO BE USED FOR GENERAL INFORMATION PURPOSES ONLY. THE AREA ALLOCATED TO THE CONVERTER STATION IS APPROXIMATE.
 2. THE LOCATION AND PHASING OF THE INCOMING AC FEEDERS AND DC LINE IN THE SUBSTATION SHALL BE AS MUCH AS POSSIBLE MAINTAINED AS SHOWN ON THE DRAWING.
 3. NEW TRANSMISSION LINES (ALL LINES OTHER THAN MARKED AS EXISTING AND FUTURE) ARE ONLY INDICATIVE AND SHALL BE DEFINED BY COMPONENT C4.

4. COMPANY HAS INSTALLED NEW GEODETIC POINTS AS FOLLOWS:

ID#	NORTHING (m)	EASTING (m)	ELEVATION (m)
13SP001	5253192.134	350165.464	157.880
13SP002	5253061.657	350723.040	156.161
13SP003	5253964.662	350298.923	207.438
926037	5253456.789	349080.376	177.249

ID# 926037 IS AN EXISTING PROVINCIAL MONUMENT ON TCH. AS SHOWN IN INSERT.



PROVINCE OF NEWFOUNDLAND
 PERMIT HOLDER
 CLASS "A"
 This Permit Allows
 SNC-LAVALIN Inc.
 To practice Professional Engineering
 in Newfoundland and Labrador.
 Permit No. as issued by PEGNI N0458
 which is valid for the year 2013.

ISSUE	REV.	DATE	DISTRIBUTION & STATUS	U.K.-SN-CD-4500-EL-SL-0007-01	U.K.-SN-CD-4500-EL-SL-0007-01	No.	REFERENCE DRAWING
3	C3	18-DEC-2013	RE-ISSUED FOR CONSTRUCTION				
2	C2	11-OCT-2013	RE-ISSUED FOR CONSTRUCTION				
1	C1	22-AUG-2013	ISSUED FOR CONSTRUCTION				

No.	DATE	REVISION	MOD.	VER.	APP.
02	18-DEC-2013	ALL SLI REF. DWG NUMBERS REMOVED. NOTE 1 REVISED AND 4 ADDED.			
01	09-OCT-2013	NOTE 1 AND 3 REVISED. COMMON FENCE BETWEEN STATIONS DELETED.			

FOR INTERNAL USE ONLY

REVIEW CLASS: EQUIPMENT TAG NUMBER:

REVIEW DOES NOT CONSTITUTE APPROVAL OF DESIGN DETAILS, CALCULATIONS, TEST METHODS OR MATERIAL DEVELOPED AND/OR SELECTED BY THE CONTRACTOR, NOR DOES IT RELIEVE THE CONTRACTOR FROM FULL COMPLIANCE WITH CONTRACTUAL OR OTHER OBLIGATIONS.

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 3. REVIEWED - NOT ACCEPTED
 4. INFORMATION ONLY
 5. NOT REVIEWED

LEAD REVIEWER: *[Signature]* Date (dd-mm-yyyy): 23 Jan 2014

NE-LCP MANAGEMENT: *[Signature]* Date (dd-mm-yyyy): 26 Sep 2011

PROJECT MANAGER: *[Signature]* Date (dd-mm-yyyy): 27 Jan 2014

PROFESSIONAL STAMP

R. WADHWA
 18 DEC 2013
 PROVINCE OF NEWFOUNDLAND

DESIGNED O. ASCENCIO	APPROVED (Discipline Lead Engineer)	CLIENT SNC-LAVALIN	PROJECT LOWER CHURCHILL PROJECT
DRAWN C. RUSSELL/M.T. GARAVITO	APPROVED (Engineering Manager)	TITLE SOLDIERS POND STATION LOCATION PLAN 230 kV SWITCHYARD AND CONVERTER SUBSTATION	
VERIFIED T. VILLARAZA		DATE 26-SEP-2011	SCALE 1:3000
SLI DOC No. 505573-4500-41DD-2001_04	NE DOC No. ILK-SN-CD- 4500-CV-PL-0001-01	Rev. C3	

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 505573-4500-41DD-2001-04.dwg
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EXHIBIT 2

COMPENSATION

1.0 GENERAL

- 1.1 Company shall compensate Contractor for the Work in accordance with the provisions of this Agreement. Subject to any additional compensation pursuant to a Change Order, only those lump sum amounts, unit rates and prices specifically identified in this Exhibit 2 shall be paid by Company to Contractor for the Work and costs not specifically identified in this Exhibit 2 are deemed to be included in such lump sum amounts, unit rates and prices for the Work. Company does not guarantee a minimum or a maximum amount of Work.
- 1.2 All lump sum amounts, unit rates and prices stated in this Exhibit 2 shall be fully inclusive of all costs (including all overhead costs) and profit for Contractor's performance of the Work and all of its obligations under this Agreement.
- 1.3 No payment in excess of the Contract Price will be made without a formal Change Order to the Agreement.
- 1.4 Invoices shall be issued by Contractor in accordance with Article 12 of the Agreement, Exhibit 2 – Compensation, Exhibit 3 – Coordination Procedures and Exhibit 13 – Provincial Benefits.
- 1.5 Capitalized terms, if not defined in the Articles or in this Exhibit 2, have the meanings ascribed to them in the Technical Specifications.

2.0 FIXED LUMP SUM

- 2.1 The following provisions in this Section 2 apply only to Work completed on a lump sum basis.
- 2.2 Where applicable, all of the payment items for Work completed on a lump sum basis are stated in Appendix A – Schedule of Price Breakdown of this Exhibit. All such payment items are fixed prices and their aggregate total shall form the fixed lump sum price of this Agreement.
- 2.3 Lump sum items stated in Appendix A – Schedule of Price Breakdown shall include all elements necessary to achieve completion of the item, whether specifically identified, or whether inherent in the Work.
- 2.4 Pursuant to Article 12 of the Agreement, payment for each item shall be on a lump sum basis and shall be made progressively as the Contractor has satisfied the requirements of each payment item.
- 2.5 If required by the Engineer, the Contractor shall submit to the Engineer, before making its application for payment under this Agreement, an Acceptable schedule of values of the various parts of the Work and totalling the full amount of the fixed lump sum price.

Such schedule of values shall be a more detailed breakdown of Appendix A - Schedule of Price Breakdown. Subject to the Articles of Agreement and other provisions in this Exhibit 2, the schedule of values shall be used as a guideline for applications by the Contractor for payment.

- 2.6 Measurement of any Work items paid on a lump sum basis shall be undertaken on a monthly basis (or as otherwise required by Engineer) by Contractor and Engineer. Each lump sum price shall be based on Work sub-divided into Payment Milestones, each with its value as specifically identified in this Exhibit 2. Progress achieved against each Payment Milestone and Accepted by Engineer shall form the basis of interim measurement and payment of each lump sum price. Only Accepted lump sum progress or Payment Milestone measurements shall form the basis of invoices of Contractor.

3.0 UNIT PRICES

- 3.1 The following provisions in this Section 3 apply only to Work completed on a unit price basis.
- 3.2 Where applicable, full compensation for unit price Work shall be determined in accordance with the unit prices set forth in Appendix A - Schedule of Price Breakdown of this Exhibit 2, or as otherwise agreed in writing between Company and Contractor (the "Unit Prices").
- 3.3 Any quantities of units estimated are not guaranteed, and payment shall only be for actual quantities of Work installed and not any estimated quantities. There shall be no adjustment of the Unit Prices due to actual quantity variances (increases/decreases) from the estimated quantities.
- 3.4 Measurement of any Work items paid on a unit price basis shall be undertaken on a monthly basis (or as otherwise required by Engineer) by Contractor and Engineer. Such measurement shall form the basis of all progress and final payments for unit price Work items. Only Accepted unit price measurements shall form the basis of invoices of Contractor.
- 3.5 Unless otherwise specifically stated, all Unit Prices shall be complete and inclusive of all costs (including overhead costs) and profit for the performance of the Work.

4.0 REIMBURSABLE WORK

- 4.1 The following provisions in this Section 4 apply only to Work completed on a reimbursable basis.
- 4.2 Where applicable, full compensation to Contractor for full and complete performance of any Work performed on a reimbursable basis shall be the sum of the following costs (which include mark-ups for all overheads and profit) exclusive of HST:

- (a) Sum of Contractor's Labour Rates, as detailed in Appendix C - Personnel Rate Schedule, multiplied by Accepted hours of Work, detailed on Accepted timesheets;
- (b) Sum of Contractor's Equipment Rates, as detailed in Appendix D - Equipment Rate Schedule, multiplied by Accepted hours of use, detailed on Accepted timesheets; and
- (c) pre-Accepted material expenses, travel and mileage expenses, and third party expenses.

Contractor shall advise Engineer in writing when it has expended seventy-five percent (75%) of the total estimated price for such reimbursable Work as stated in this Exhibit 2.

The labour and equipment rates stated in the Appendices of this Exhibit 2 will not be adjusted for any reason whatsoever except as a result of the issuance of a Change Order by Company.

The Contractor shall not be compensated for any Contractor's Personnel not identified in Appendix D – Personnel Rate Schedule.

4.3 When Contractor is requested to purchase materials on a reimbursable basis:

- (a) All actual costs to Contractor for materials supplied for incorporation into the permanent facility to which the Work applies (including those costs related to transportation to the Site) shall be at actual invoiced cost to Contractor (exclusive of HST) as substantiated by invoices certified as paid or by such documentation as may be required by Company, plus a mark-up of five percent (5%); provided that each consumable, expendable and small tool which costs Contractor less than \$2,000.00 Canadian each, and all consumables, expendables and small tools listed in Appendix C - Personnel Rate Schedule, shall not be reimbursed by Company.
- (b) To be eligible for reimbursement, invoicing for third party supplied materials shall be fully supported by Billing Information and any other documentation that Engineer may reasonably require.
- (c) Company reserves the right to provide, at no cost to Contractor, materials, equipment, services, supplies or incidentals required to perform the Work.

4.4 When Contractor is requested to supply equipment on a reimbursable basis:

- (a) All costs of Contractor for Contractor-owned equipment shall be at the rates set forth in Appendix D - Equipment Rate Schedule.

- (b) When Contractor's equipment does not resemble the equipment having rental rates listed in Appendix D - Equipment Rate Schedule, the rate of such equipment shall be determined insofar as it is practical to do so, in accordance with and in the manner provided for in the latest revised edition of the publication of the Government of Newfoundland and Labrador, Department of Works, Services and Transportation, Highway Design Division's Form 1000 entitled "Newfoundland Equipment Rental Schedule" at the time of the Effective Date.
 - (c) All costs of Contractor, exclusive of HST, for equipment which is rented from third parties and does not resemble the equipment having rental rates listed in Appendix D - Equipment Rate Schedule must be Accepted prior to rental and shall be at actual cost, exclusive of HST, to Contractor, including transportation to the Site, as substantiated by invoices certified paid or by such documentation as may be required by Company plus a mark-up of five percent (5%).
 - (d) To be eligible for reimbursement, invoicing for third party equipment shall be fully supported by Billing Information and any other documentation that Engineer may reasonably require.
 - (e) For reimbursable equipment, Company reserves the right to substitute and provide, at no cost to Contractor, equipment to perform the Work. Contractor shall not be allowed to claim for loss of profit and/or any of its own costs resulting from such substitution by Company.
- 4.5 When Contractor requires third party services to assist with Work being performed on a reimbursable basis:
- (a) Contractor shall secure pre-Acceptance of any third party services, materials, tools, supplies and consumables that are required for the performance of the Work and are additional to that which is included in Appendix A - Schedule of Price Breakdown, Unit Prices and lump sum amounts, rates and prices outlined herein. Company shall reimburse Contractor for the actual, documented and necessary costs (exclusive of HST) of such materials, tools, supplies, consumables, equipment and/or services.
 - (b) All third party services provided by others for performance of the Work which have been previously Accepted shall be at actual cost to Contractor, exclusive of HST, of such third party services plus a mark-up of five percent (5%).
 - (c) In no instance shall the third party rates plus mark-up exceed Contractor's rates for similar services.
 - (d) To be eligible for reimbursement, invoicing for third party services shall be fully supported by Billing Information and any other documentation that Engineer

may reasonably require.

4.6 When Contractor requires labour for Work being performed on a reimbursable basis:

- (a) All costs of Contractor for such labour shall be at the rates set forth in Appendix C - Personnel Rate Schedule, which rates include a mark-up for overhead and profit of twelve percent (12%). Contractor represents that such rates includes such mark-up.
- (b) All costs of Contractor, exclusive of HST, for labour that does not resemble that which is listed in Appendix C - Personnel Rate Schedule must be Accepted prior to the engagement of such labour and shall be at actual cost, exclusive of HST, to Contractor, as substantiated by Accepted time sheets or by such documentation as may be required by Company, plus a mark-up of twelve percent (12%).
- (c) To be eligible for reimbursement, invoicing for such labour shall be fully supported by Billing Information and any other documentation that Engineer may reasonably require.

4.7 In relation to Contractor's unionized employees deployed at the Site under this Agreement, any and all costs, exclusive of HST, relating to Contractor provided:

- (a) air transportation,
- (b) travel allowance, and
- (c) board (but only to the extent that accommodations are not available at Site for such employees)

will be compensated in accordance with the applicable labour agreement between Contractor and its employees relating to the Site, as pass through expenses without any mark-up for administration, overhead and/or profit. Contractor shall not be compensated for any other items, costs or expenses in relation to Contractor's Personnel.

4.8 For all Work carried out on a reimbursable basis, Contractor shall prepare time sheets for all Personnel, equipment, material and third party services assigned to the performance of the Work which will be provided daily to the Engineer for Acceptance. Copies of time sheets shall accompany all Contractor invoices.

4.9 When Contractor uses materials, equipment and/or services of any of its Affiliates or any Person with which Contractor has a non-arm's length relationship (including but not limited to common ownership, subsidiary, strategic partner or licensee) to undertake reimbursable Work, then the Contractor shall be entitled to charge Company the actual documented base cost of such Affiliate or Person (as the case may be) for such materials,

equipment and/or services, subject to the removal of any element of overhead and/or profit, plus a mark-up of five percent (5%).

- 4.10 For all Work carried out on a reimbursable basis and to be performed by third party suppliers or service providers, Contractor shall solicit a minimum of three bids for material purchases of \$25,000.00 Canadian and greater. Contractor shall select the qualified bidder with the lowest bid unless otherwise directed and/or Accepted by Engineer.

5.0 CHANGES

Whenever possible, Changes will be evaluated and agreed by the Parties on a lump sum or unit rate basis. In the event that the Parties cannot agree on a lump sum or unit rate price for a Change, Contractor will present Company with a cost estimate of the Change, based on the rates and prices in Appendices A- Schedule of Price Breakdown, C - Personnel Rate Schedule and D - Equipment Rate Schedule of this Exhibit 2. Where Changes are carried out on a reimbursable basis, Contractor shall ensure that it provides a copy of the associated Change Order, along with all documentation necessary which clearly supports the charges submitted for payment and clearly demonstrates achievement of criteria, progress of the Change Work, or achievement of the Milestones contained therein, as the case may be.

Rates and prices outlined in Appendices A - Schedule of Price Breakdown, C - Personnel Rate Schedule and D - Equipment Rate Schedule of this Exhibit 2 will apply for both increases and decreases in the Work.

Where any Work relating to a Change is performed without agreement between Company and Contractor on a price for such Work:

- (a) the adjustment to the Contract Price shall be in accordance with the provisions of the Articles of this Agreement; and
- (b) for the purpose of Article 14.10(b)(i) of this Agreement, the allowance referenced therein shall be the total of:
 - (i) the percentage amount stated in Section 4.3(a) for purchased materials;
 - (ii) the percentage amount stated in Section 4.4(c) for supplied equipment;
 - (iii) the percentage amount stated in Section 4.5(b) for third party services;
 - (iv) the percentage amount stated in Section 4.6(b) for labour;

but only if, and to the extent that, purchased materials, supplied equipment, third party services and/or labour are required for such Change Work and Approved by Company.

6.0 COMPENSATION FOR STANDBY TIME

When the Work is suspended pursuant to Article 28 or Company requires Contractor to standby pursuant to Article 29.7 or a Change that requires both an extension to a Milestone Date and which results in Contractor's equipment being idle during the length of the extension, the following provisions will apply:

- (a) Where it is necessary to retain the equipment in the Work area for extended periods as Approved by Company, Company will pay Contractor for stand-by time as follows:
 - (i) for equipment, other than rented equipment and operated rented equipment, at fifty percent (50%) of the applicable rate stated in Appendix D - Equipment Rate Schedule; and
 - (ii) for rented equipment and operated rented equipment at one hundred percent (100%) of the lessor's invoice price;
- (b) Contractor shall prepare daily time sheets for all labour and equipment assigned to the performance of the Work, which will be reviewed, and if Accepted, signed by the Engineer. Copies of time sheets shall accompany all Contractor invoices.
- (c) Payment for such stand-by will be limited to not more than eight hours in a twenty-four hour day or forty hours in a week.

Notwithstanding the above, no compensation will be allowed for equipment that is inoperable due to breakdown, unavailability or the like. No payment will be allowed for equipment that is not operating because the Work has been delayed or suspended by Contractor for its own reasons.

7.0 NOT USED

8.0 PROJECT LABOUR AGREEMENT

The Lower Churchill Project Transmission Construction Collective Agreement (LCP – TCCA), as attached in Exhibit 11 - Company Supplied Documents, will be effective for the Site upon enactment of a pending Special Project Order (SPO) declaration. The Contractor shall (a) be bound to the terms of the LCP-TCCA in respect of the Work at the Site, (b) become a member of the Project Employers' Association relating to the Site, and (c) name at least one (1) staff person to be responsible for daily labour relations matters at the Site.

Prior to working at Site, all Contractor's Personnel will be required to attend an LCP Site orientation session that includes: health, safety and environment obligations; human resources policies, including respectful workplace, cultural sensitivity, gender equity and diversity; and labour relations, including LCP-TCCA overview, site standards, corrective action and dispute resolution.

Appendix E - Estimated Trade Person-Hour Schedule of this Exhibit 2 details the estimated trade person-hours which shall be an accurate representation of the person-hours required by trade classification to complete the Scope of Work.

9.0 PERFORMANCE SECURITY

Contractor shall provide the following performance security in respect of Contractor's obligations under this Agreement, in the form and with the content set out in Exhibit 14 – Performance Security: Performance Bond and Labour and Material Payment Bond.

10.0 LIQUIDATED DAMAGES

If Contractor fails to deliver the Work to achieve the Milestones for Substantial Completion by the date specified for Substantial Completion in Exhibit 9 - Work and Milestone Schedule, Contractor shall pay Company as liquidated damages the full amount set out below for each calendar day, including any part thereof, of the delay of that Milestone, from the date the delay commenced to the date the Milestone is achieved, subject to the liability limit referred to in Article 26.1 of this Agreement, unless the failure to achieve the Milestone is due to an event of Force Majeure.

First 30 Days of delay: Fifty Thousand Dollars (\$50,000.00) per day beginning the first (1st) calendar day of the delay.

For delays between Day 31 and 60: Seventy Five Thousand Dollars (\$75,000.00) per day beginning the thirty first (31st) calendar day of the delay.

For delays beyond Day 61: One Hundred Thousand Dollars (\$100,000.00) per day beginning the sixty first (61st) calendar day of the delay.

11.0 CONTRACTOR FUEL

Contractor shall be responsible for supplying all fuel to perform the Work. All costs associated with such fuel shall be all inclusive and deemed to be included in the Contract Price. The diesel fuel component of the Contract Price shall be subject to adjustment as set out below. There shall be no adjustment to the Contract Price for any other fuel used for the Work.

Contractor shall be responsible for tracking diesel fuel purchases, metering fuel usage and providing a Monthly Fuel Consumption Report in the form as attached in Exhibit 6 – Environmental and Regulatory Compliance Requirements (which shall be attached to Contractor's invoices). All supporting documentation, as required by Engineer or Company, shall be subject to the Approval of Company.

Any adjustments to the Contract Price (up or down) due to changes in diesel fuel price shall be based on the time of purchase and relevant location (i.e. Soldiers Pond) and shall exclude any

and all indirect costs, including labour and transportation of fuel. The base rate is provided under Table 6: Fuel Usage Table in Appendix A - Schedule of Price Breakdown (the "Agreed Rate Price").

Applicable adjustments shall be performed monthly by Contractor based on the Petroleum Pricing Regulated Fuel Prices from the Board of Commissioners of Public Utilities for Newfoundland and Labrador (<http://www.pub.nf.ca/ppoprices.htm>) only for Diesel (S/S or F/S) at Zone 1 Avalon Peninsula (Soldiers Pond). Adjustments will be based upon the Diesel (S/S or F/S) price noted above for the last day of the applicable month the adjustment is applied. All supporting documentation, as required by Engineer or Company, shall be subject to the Approval of Company.

Any such adjustments due to changes in diesel fuel price will be calculated using the following formula:

*FUEL PRICE ADJUSTMENT = (Last Day of the Month Purchase Price – Agreed Rate Price) * Purchase Quantity*

If the purchased quantity of diesel fuel for any given location exceeds the Contractor's estimate as set out in Table 6: Fuel Usage Table plus ten percent (10%) then no further diesel fuel adjustment to the Contract Price shall be applied with respect to that location.

If the fuel price adjustment is negative, the credit shall be applied to the fuel price adjustment the following month. If, at the end of the Work, there is a negative balance, the remaining credit shall be deducted from the final payment owed to Contractor. Otherwise, the fuel price adjustment shall be paid on a monthly basis according to the payment terms in the Articles of this Agreement and as stated in this Exhibit 2.

EXHIBIT 2 - APPENDIX A

SCHEDULE OF PRICE BREAKDOWN

Table 1: Total Estimated Contract Price Summary

DESCRIPTION	PRICE (CDN \$)
Soldiers Pond - Indirects (Table 2)	\$11,641,122.91
Soldiers Pond - AC Switchyards (Table 3)	\$6,989,950.00
Soldiers Pond - DC Converter Station (Table 4)	\$4,246,650.00
Soldiers Pond - AC Synchronous Condenser Station (Table 5)	\$8,016,050.00
Total Estimated Contract Price	\$30,893,772.91

Table 2: Soldiers Pond Indirects

PAY ITEM	DESCRIPTION	UNIT OF MEASURE	QTY A	MAN HOURS	MANPOWER COST B	MATERIAL COST C	EQUIPMENT COST D	PRICE (CDN \$)	
								UNIT RATE E=(B+C+D)/A	TOTAL F= A x E
INDIRECTS									
0001	Mobilization	LS	1	1,352	117,289.29	362,690.73	42,519.98	522,500.00	522,500.00
0002	Site installation	LS	1	2,654	250,575.35	506,744.87	39,679.78	797,000.00	797,000.00
0003	Contractor Equipment for Indirects	LS	1	1,454	107,343.91	0.00	548,656.09	656,000.00	656,000.00
0004	Temporary Works	LS	1	1,717	128,523.79	16,555.27	214,920.94	360,000.00	360,000.00
0005	Management and Staff	LS	1	55,402	4,188,038.63	10,860.12	287,601.25	4,486,500.00	4,486,500.00
0006	Attendant Labour	LS	1	1,777	189,626.76	46,373.24	0.00	236,000.00	236,000.00
0007	Site Services	LS	1	889	67,333.26	406,314.42	638,352.32	1,112,000.00	1,112,000.00
0008	Accommodation (non-union labour)	mth	6	-	0.00	404,000.00	0.00	67,333.33	404,000.00
0009	Accommodation (union labour)	LS	1	-	-	490,860.00	-	490,860.00	490,860.00
0010	Employee Training	LS	1	858	63,014.51	1,985.49	0.00	65,000.00	65,000.00
0011	Health and Safety Requirements	LS	1	6,721	412,061.19	246,938.81	0.00	659,000.00	659,000.00
0012	Environmental Requirements	LS	1	2,735	142,667.30	0.00	17,332.70	160,000.00	160,000.00
0013	Quality Assurance/Quality Control	LS	1	6,721	439,701.67	408,298.33	0.00	848,000.00	848,000.00
0014	Site Maintenance	LS	1	2,666	198,750.34	0.00	287,249.66	486,000.00	486,000.00
0015	Demobilization	LS	1	275	13,052.24	178,380.57	8,567.19	200,000.00	200,000.00
0016	Performance Bond	LS	1	-	-	-	-	93,519.03	93,519.03
0017	Labour and Material Payment Bond	LS	1	-	-	-	-	64,743.88	64,743.88
TOTAL ESTIMATED PRICE FOR SOLDIERS POND INDIRECTS									11,641,122.91

Table 3: Soldiers Pond AC Switchyards

PAY ITEM	DESCRIPTION	UNIT OF MEASURE	QTY A	MAN HOURS	MANPOWER COST B	MATERIAL COST C	EQUIPMENT COST D	PRICE (CDN \$)	
								UNIT RATE E=(B+C+D)/A	TOTAL F= A x E
DIRECTS									
0018	Clearing and Grubbing	m2	65,000	1,574	119,551.79	0.00	247,698.21	5.65	367,250.00
0019	Bog / Muskeg Removal	m3	22,000	981	74,096.78	0.00	158,003.22	10.55	232,100.00
0020	Excavation (Common or other material) including disposal on-site	m3	250,000	5,050	379,583.85	0.00	1,032,916.15	5.65	1,412,500.00
0021	Excavation (Rock)	m3	20,000	822	61,767.20	292,536.77	156,696.03	25.55	511,000.00
0022	Fill (Common)	m3	120,000	2,142	167,333.87	0.00	180,666.13	2.90	348,000.00
0023	Fill (Rock)	m3	18,000	282	22,031.18	0.00	23,868.82	2.55	45,900.00
0024	Fill (Borrow) granular 300 mm thick surfacing	m3	17,000	1,154	87,005.74	451,921.30	133,422.96	39.55	672,350.00
0025	Slope Protection (Perimeter slope rock riprap, ditches)	m2	5,000	572	43,434.93	22,018.39	82,296.68	29.55	147,750.00
0026	Access Road Design	LS	1	-	139,600.00	0.00	0.00	139,600.00	139,600.00
0027	Build Access Road (new 1570 m, roads A+C+E, including excavation, ditches, culverts, silt control, guide rails, signage and asphalt paving)	LS	1	6,456	342,389.34	1,114,869.63	870,141.03	2,322,400.00	2,327,400.00
0028	Silt Sedimentation Control (Temporary silt fence, check dam, sediment traps, and periodic clean-up)	LS	1	742	53,734.29	54,739.89	19,025.82	127,500.00	127,500.00
0029	Clearing and Grubbing of Laydown / Stockpiling / Spoil Area (2 - 200m x 30m), including their access	LS	1	50	3,933.43	0.00	6,666.57	10,600.00	10,600.00
0030	Site Facilities for CD0501, CD0502, CD0534 (three (3) 100 m x 100 m each) including access	LS	1	3,189	245,340.03	55,447.93	347,212.04	648,000.00	648,000.00
TOTAL ESTIMATED CONTRACT PRICE FOR SOLDIERS POND AC SWITCHYARDS									6,989,950.00

Table 4: Soldiers Pond Converter Station

PAY ITEM	DESCRIPTION	UNIT OF MEASURE	QTY A	MAN HOURS	MANPOWER COST B	MATERIAL COST C	EQUIPMENT COST D	PRICE (CDN \$)	
								UNIT RATE E=(B+C+D)/A	TOTAL F= A x E
DIRECTS									
0031	Clearing and Grubbing	m2	102,000	2,798	213,047.43	0.00	404,052.57	6.05	617,100.00
0032	Bog / Muskeg Removal	m3	28,000	1,178	89,394.80	0.00	189,205.20	9.95	278,600.00
0033	Excavation (Common or other material)	m3	10,000	202	15,183.35	0.00	41,316.65	5.65	56,500.00
0034	Fill (Common)	m3	290,000	5,176	402,720.91	0.00	423,779.09	2.85	826,500.00
0035	Fill (Rock)	m3	180,000	3,661	285,047.47	0.00	299,952.53	3.25	585,000.00
0036	Fill (Borrow) granular 300 mm thick surfacing	m3	30,000	2,037	153,253.89	796,016.37	237,229.74	39.55	1,186,500.00
0037	Slope Protection (Perimeter slope rock riprap, ditches)	m2	10,000	1,131	87,123.99	41,848.85	166,527.16	29.55	295,500.00
0038	Subsurface Drain - Corrugated Metal Pipe Drain 600 mm Dia. (including bedding, geotextile wrapping, end rip rap)	m	330	819	60,270.57	67,446.06	63,683.37	580.00	191,400.00
0039	N-E Pond draining (including site preparation, ditching, and preparing for settling pond)	LS	1	961	70,747.92	53,983.68	84,818.40	209,550.00	209,550.00
TOTAL ESTIMATED CONTRACT PRICE FOR SOLDIERS POND CONVERTER STATION									4,246,650.00

Table 5: Soldiers Pond Synchronous Condenser Station

PAY ITEM	DESCRIPTION	UNIT OF MEASURE	QTY A	MAN HOURS	MANPOWER COST B	MATERIAL COST C	EQUIPMENT COST D	PRICE (CDN \$)	
								UNIT RATE E=(B+C+D)/A	TOTAL F= A x E
DIRECTS									
0040	Clearing and Grubbing	m2	45,000	1,164	89,095.67	0.00	165,154.33	5.65	254,250.00
0041	Bog / Muskeg Removal	m3	4,000	168	12,770.69	0.00	27,029.31	9.95	39,800.00
0042	Excavation (Common or other material)	m3	180,000	3,636	273,300.37	0.00	743,699.63	5.65	1,017,000.00
0043	Excavation (Rock)	m3	60,000	2,095	157,468.68	885,176.28	412,355.04	24.25	1,455,000.00
0044	Fill (Common)	m3	120,000	2,142	166,643.14	0.00	175,356.86	2.85	342,000.00
0045	Fill (Rock)	m3	30,000	610	47,507.91	0.00	49,992.09	3.25	97,500.00
0046	Fill (Borrow) granular 300 mm thick surfacing	m3	10,000	679	51,168.15	265,864.31	78,467.54	39.55	395,500.00
0047	Slope Protection (Perimeter slope rock riprap, ditches)	m2	15,000	1,477	114,048.85	24,342.36	232,858.79	24.75	371,250.00
0048	Build Access Road (New 400 m, including ditches, culverts, and silt control)	LS	1	6,573	493,159.80	2,035,355.06	1,236,485.14	3,765,000.00	3,765,000.00
0049	Site Water Management (Permanent ditches, yards)	M	1,700	806	60,546.85	70,099.64	90,353.51	130.00	221,000.00
0050	Site Rehabilitation - Terrafix erosion control blanket or equal	m2	3,000	252	17,837.79	35,396.86	4,515.35	19.25	57,750.00
TOTAL ESTIMATED CONTRACT PRICE FOR SOLDIERS POND SYNCHRONOUS CONDENSER STATION									8,016,050.00

Table 6: Fuel Usage Table

PAY ITEM	FUEL TYPE	AGREED RATE PRICE (CDN \$/LITER)	UNIT OF MEASURE	ESTIMATED FUEL QUANTITY USAGE (LITER)
				SOLDIERS POND (Zone 1 Avalon Peninsula)
0051	Diesel (S/S and F/S)	1.44	Liter	2,255,000

EXHIBIT 2 – APPENDIX A

ATTACHMENT 1

MEASUREMENT AND PAYMENT

1. GENERAL**1.1. Quantities**

1.1.1. Refer to Exhibit 2 - Compensation Section 3.

1.2. Lump Sum Price Measurement for Payment

1.2.1. Refer to Exhibit 2 - Compensation Section 2.

1.3. Unit Price Measurement for Payment

1.3.1. Refer to Exhibit 2 - Compensation Section 3.

1.4. Performance Security

(Pay item 0016, 0017)

1.4.1. Lump sum payment upon submission of Performance Bond and Labour and Material Payment Bond as per Agreement requirements and as Approved by Company.

1.5. Progress Measurement Plan

1.5.1. Contractor will submit for Company review and Approval a Progress Measurement Plan (as per Exhibit 3 - Coordination Procedures), which will quantify the progress of each activity in relation to the Control Schedule. The plan will be progressed for the duration of the project as required to perform the Work.

1.6. Sources of Material

1.6.1. No separate measurement for payment will be made for the exploitation of required excavations, borrow areas and any stockpile areas for the production of materials required for the construction of roads, stockpile areas, embankment, embankment at the switchyard or other material requirements.

2. INDIRECT COSTS

For clarity, overall earned construction progress means the percent complete of all direct pay items calculated by dividing the earned manhours to date over the total estimated manhours as indicated in Appendix A – Schedule of Price Breakdown. In the event that indirect costs are not fully paid by Substantial Completion, there will be a reconciliation and any outstanding balance for indirect costs will be paid at Final Completion.

2.1. Mobilization

(Pay item 0001)

2.1.1. "Mobilization" means each and every activity required for the Contractor to transport labour, equipment, materials, and similar items required for performance of the Work

to the Sites, and each and every activity required to make said labour, equipment, materials, and similar items ready to perform the Work, to the satisfaction of Engineer, and shall include, but not be limited to, organizational and project management, equipment transportation, setting up, SDRL document deliverable requirements (A01, A02, A04, A07, A08, A35, Q03, Q04 and Contractors Health and Safety Plan in accordance with Exhibit 5 – Health & Safety Requirements) and all preparation necessary for performing the Work, including all costs associated with Contractor's Personnel attending Engineer's safety orientation courses. This pay item also includes upgrading of the existing access road to the Site until such time as the permanent access road is complete. Any grubbing material generated from upgrading the existing access road shall be pushed alongside the road right of way.

2.1.2. Contractor shall provide to the Engineer a list of tasks and mobilization schedule prior to mobilization which must be Approved by the Engineer.

2.1.3 Payment for Mobilization shall be lump sum based on progress as Approved by Company and in accordance with the deliverables identified in item 2.1.1 and 2.1.2 above.

2.2. Site Installation

(Pay item 0002)

2.2.1. "Site Installation" means all temporary buildings needed for the Work, but not involved directly in its execution, such as, but not limited to, Site offices, lunch trailers, warehouses, stores, garage, carpenter shop, washcars, workshops and laboratories. It shall also include the furniture required for the offices (desks, chairs, bookcases, etc.) and the equipment normally required to make each of the other buildings fully functional for its purpose. This shall include Company and Engineer Site offices and other Site requirements for Company and Engineer.

2.2.2. Payment for Site Installation shall be lump sum based on progress as Approved by Company and in accordance with the deliverables identified in item 2.2.1 above.

2.3. Contractor Equipment for Indirects

(Pay item 0003)

2.3.1. "Contractor Equipment for Indirects" means equipment used to service the laydown areas, the bus for transportation from the accommodation to Site and back, pickup trucks, and other items such as flatbed trucks, mobile crane, forklift, etc.

2.3.2. Payment for Contractor Equipment for Indirects shall be based on overall earned construction progress as Approved by Company.

2.4. Temporary Works

(Pay item 0004)

2.4.1. "Temporary Works" means items such as construction of the temporary access roads, traffic control, fencing, signage, stairways, ladders and other temporary items to perform the Work.

2.4.2. Payment for Temporary Works shall be based on overall earned construction progress as Approved by Company.

2.5. Management and Staff

(Pay item 0005)

2.5.1. "Management and Staff" means Contractor's Representative, managers, superintendents, other site supervisors, engineers and their assistants, quantity surveyor, clerks, typists, security watchmen, surveyors and all such other personnel. This item excludes the staff included in pay items:

0011 – Health and Safety Requirements;

0012 – Environmental Requirements;

0013 – Quality Assurance/Quality Control.

2.5.2. Payment for Management and Staff shall be based on overall earned construction progress as Approved by Company.

2.6. Attendant Labour

(Pay item 0006)

2.6.1. "Attendant Labour" means the personnel involved in unloading and distribution, working in the laydown area, removing waste, cleaning, repairing vehicles, driving the bus and other driving, and all such other labour. It does not include labour to maintain the access roads and laydown area, and keeping the Site clear of obstructions; this is covered under item 2.14 – Site Maintenance.

2.6.2. Payment for Attendant Labour shall be based on overall earned construction progress as Approved by Company.

2.7. Site Services

(Pay item 0007)

2.7.1. "Site Services" means the cost of power, lighting and heating, potable and industrial water, septic, stationary, computer equipment, drafting equipment, telephones, fax machines, telecommunication costs and any other costs of this nature.

2.7.2. Payment for Site Services shall be based on overall earned construction progress as Approved by Company.

2.8. Accommodation (Non-union Labour)

(Pay item 0008)

- 2.8.1. "Accommodation" means the cost of providing all boarding and lodging and associated services.
- 2.8.2. Payment for Accommodation (non-union labour) will be made monthly.

2.9. Accommodation (Union Labour)**(Pay item 0009)**

- 2.9.1 Contractor shall make best efforts to hire local unionized employees within the Free Zone as defined in Article 25 of the Lower Churchill Project Transmission Construction Collective Agreement between Lower Churchill Transmission Construction Employers' Association Inc. and International Brotherhood of Electrical Workers and IBEW Local Union 1620. For any unionized employees outside the Free Zone and where Contractor has to compensate its unionized employees for air transportation, travel allowance, or board, then Contractor shall be compensated in accordance with section 4.7 of Exhibit 2.

2.10. Employee Training**(Pay item 0010)**

- 2.10.1. "Employee Training" means the costs of the manhours expended in training personnel to meet the Health and Safety Requirements; and any other training requirements in accordance with the Agreement.
- 2.10.2. Payment for Employee Training shall be based on overall earned construction progress as Approved by Company.

2.11. Health and Safety Requirements**(Pay item 0011)**

- 2.11.1. "Health and Safety Requirements" means all of the requirements of Exhibit 5 – Health and Safety Requirements, including the staff required to administer these requirements.
- 2.11.2. Payment for Health and Safety Requirements shall be based on overall earned construction progress as Approved by Company.

2.12. Environmental Requirements**(Pay item 0012)**

- 2.12.1. "Environmental Requirements" means all of the requirements of Exhibit 6 – Environmental and Regulatory Compliance Requirements and Technical Specification, including the administration staff required to administer these requirements; including also the operation and maintenance of sediment ponds and the construction,

operation and maintenance of any other sediment ponds required to conform, to the environmental requirements.

2.12.2. Payment for Environmental Requirements shall be based on overall earned construction progress as Approved by Company.

2.13. Quality Assurance/Quality Control

(Pay item 0013)

2.13.1. "Quality Assurance/Quality Control" means all of the requirements of Exhibit 7 – Quality Requirements, including the staff to administer these requirements.

2.13.2. Payment for Quality Assurance/Quality Control shall be based on overall earned construction progress as Approved by Company.

2.14. Site Maintenance

(Pay item 0014)

2.14.1. "Site Maintenance" shall include the cost of all labour, materials and equipment used to carry out the work of construction of new temporary roads and access ramps, including, if required, overburden and rock excavation, supply and installation of culverts, transportation of materials and backfilling, their displacement when required and their removal on completion of work. This price shall also include the cost of all labour, materials and equipment used to carry out the work of maintenance, dust control and snow clearing of all new and existing construction roads, access ramps and work areas, as well as Contractor's laydown area and Contractor's designated space in Company's laydown area for the Term of the Agreement and as required for the Work.

2.14.2. Payment for Site Maintenance shall be based on overall earned construction progress as Approved by Company.

2.15. Demobilization

(Pay item 0015)

2.15.1. "Demobilization" means that the Certificate of Substantial Completion has been issued and each and every activity required for the Contractor to remove all Contractors' labour, equipment, materials, and similar items from the Sites are complete to the satisfaction of the Engineer. Completion of such items shall include, but are not limited to, preparation and submission of all turnover documentation, removal of all materials and equipment and the final cleanup of the Contractor's Site areas upon completion of the Work to the satisfaction of the Engineer.

2.15.2. Payment for Demobilization will be made as a lump sum, when Contractor has fully demobilized from Site and Company has issued a Final Completion Certificate. The demobilization of personnel and equipment that is no longer required for the Work must be presented to the Engineer for review and approval prior to such taking place.

3. DIRECT COSTS

For clarity, all excavated materials are assumed crushed on site and it is intended to develop the substation Site with balanced cut/fill material (without having to import fill materials). Payment for the imported fill material shall be made in accordance with the Article 14 of this Agreement.

3.1 Clearing and Grubbing

(Pay item 0018, 0031, 0040)

- 3.1.1. Measurement and payment for Clearing and Grubbing shall be by the square meter based on the horizontal area actually grubbed and cleared within the clearing and grubbing limits as shown on Drawings or as required by the Engineer.
- 3.1.2. No separate measurement shall be made for surface boulder removal during clearing and grubbing operations, handling and all haulage involved in clearing and grubbing disposal, or stockpiling operations.

3.2. Bog/Muskeg Excavation

(Pay item 0019, 0032, 0041)

- 3.2.1. Measurement and payment for removal of bog and shall be by the cubic meter based on the actual volume of bog material removed within the bog limits as shown on Drawings or as required by the Engineer.
- 3.2.2. No separate measurement shall be made for surface boulder removal during bog removal operation or for any and all haulage involved in bog disposal on Site.
- 3.2.3. Cross sectioning for the purpose of payment for common and rock excavation in the Specifications will not be done until clearing and grubbing operations are completed in the designated area and Approved by the Engineer.

3.3. Excavation (Common or other material)

(Pay item 0020, 0033, 0042)

- 3.3.1. Measurement and payment for Common Excavation shall be by the cubic meter based on the volume of common material actually excavated and in accordance with the principles set out in Sections 3.3.2 to 3.3.10 inclusive:
- 3.3.2. Common Excavation includes all work required for excavation of common material within the Site. Work includes excavation, loading, hauling, unloading, handling, and stockpiling, complete with stockpile maintenance and management. Work shall also include on-site disposal of material not meeting the specification for Common Fill.
- 3.3.3. Prior to commencement of the Work the Contractor shall perform its own survey which shall be subject to the review and Acceptance of Engineer. The Contractor's

survey shall define the baseline of the Site and shall cover the area of permanent Work and the immediate vicinity. Engineer, at its sole discretion, may perform its own survey and any discrepancies between the Engineer's survey and Contractor's survey shall be reconciled prior to commencement of any Work.

- 3.3.4. Theoretical excavation levels are defined from the "Approved for Construction" Drawings, or from adaptations to those Drawings notified in writing to the Contractor by the Engineer. No over-excavation, compared with theoretical profiles will be paid.
- 3.3.5. Only where excavation has not been defined on the Drawings or by notification and by prior agreement between the Parties shall one proceed to measure quantities based on differences between levels before and after excavation.
- 3.3.6. Prices in this section apply regardless of the geometry of the excavation, even if they are narrow, and inaccessible to heavy construction equipment.
- 3.3.7. The volume of the excavation shall be computed before and after surveying using 5m x 5m grid over the excavation area as per Drawings. Quantities computed for Common Excavation shall be rounded to the nearest whole number.
- 3.3.8. All transportation of materials from the surface excavations of the permanent Work will be deemed to be made over a maximum distance of 2.0 km, measured in a straight line, from the center of gravity of the excavation to the place of discharge.
- 3.3.9. If, before the commencement of the excavation in a given area, the Engineer requires a relocation of the excavation lines beyond the position shown on the Drawings, payment for the additional excavation shall be made at the unit price item for the adjacent excavation.
- 3.3.10. If, after the commencement of the excavation in a given area, the Engineer requires a relocation of the excavation lines beyond the position shown on the Drawings, payment for the additional excavation shall be made in accordance with the Article 14 of this Agreement.

3.4. Excavation (Rock)

(Pay item 0021, 0043)

- 3.4.1. Measurement and payment for Rock Excavation shall be by the cubic meter based on the volume of rock actually excavated and in accordance with the principles set out in Sections 3.4.2 to 3.4.13 inclusive:
- 3.4.2. Rock Excavation includes all work required for excavation of rock material at the Site. Work includes drilling and blasting (excluding wall control), excavation, loading, hauling, unloading, handling, stockpiling, complete with stockpile maintenance and management.
- 3.4.3. Prior to commencement of the Work the Contractor shall perform its own survey which shall be subject to the review and Acceptance of Engineer. The Contractor's

survey shall define the baseline of the Site and shall cover the area of permanent Work and the immediate vicinity. Engineer, at its sole discretion, may perform its own survey and any discrepancies between the Engineer's survey and Contractor's survey shall be reconciled prior to commencement of any Work.

- 3.4.4. Theoretical excavation levels are defined from the "Approved for Construction" Drawings, or from adaptations to those Drawings notified in writing to the Contractor by the Engineer. No over-excavation, compared with theoretical profiles will be paid.
- 3.4.5. Only where excavation has not been defined on the Drawings or by notification and by prior agreement between the Parties shall one proceed to measure quantities based on differences between levels before and after excavation.
- 3.4.6. Prices in this section apply regardless of the geometry of the excavation, even if they are narrow, and inaccessible to heavy construction equipment.
- 3.4.7. The volume of Rock Excavation shall be computed before and after surveying using 10m x 10m grid over the excavation area as per Drawings. Quantities computed for Rock Excavation shall be rounded to the nearest whole number.
- 3.4.8. All transportation of materials from the surface excavations of the permanent Work will be deemed to be made over a maximum distance of 1.5km, measured in a straight line, from the center of gravity of the excavation to the place of discharge.
- 3.4.9. Prices applicable to Rock Excavation cover all Work relevant to this operation and in particular the measures necessary for environmental protection, safety of Personnel, equipment and existing structures and those imposed by the need to achieve the prescribed profiles, in accordance with Technical Specifications.
- 3.4.10. No separate measurement and payment will be made for dental excavation, scaling of the excavated surfaces, cleaning the rock to sound bedrock, removing and disposing of fragments of loose rock, lift equipment, adequate lightning for geological mapping, or the removal of snow and ice.
- 3.4.11. No separate measurement and payment will be made for excavation for the Contractor's own construction purposes, construction and removal of working platforms or access ramps, and any necessary bench excavation to comply with the minimum excavation line.
- 3.4.12. If, before the commencement of the excavation in a given area, the Engineer requires a relocation of the excavation lines beyond the position shown on the Drawings, payment for the additional excavation shall be made at the unit price item for the adjacent excavation.
- 3.4.13. If, after the commencement of the excavation in a given area, the Engineer requires a relocation of the excavation lines beyond the position shown on the Drawings, payment for the additional excavation shall be made in accordance with the Article 14 of this Agreement.

3.5. Fill (Common)**(Pay item 0022, 0034, 0044)**

- 3.5.1. Payment for Common Fill shall be by the cubic meter based on the volume of Common Fill actually placed and in accordance with the principles set out in Sections 3.5.2 to 3.5.5 inclusive:
- 3.5.2. Measurement of Common Fill shall be based on the cross-section or Approved equal sheets between the position of the ground lines or Rockfill lines before the Common Fill was placed and the completed and the accepted fill lines.
- 3.5.3. Prior to commencement of the Work the Contractor shall perform its own survey which shall be subject to the review and Acceptance of Engineer. The Contractor's survey shall define the "excavated and/or Rockfill state" of the Site and shall cover the area of permanent Work and the immediate vicinity. Engineer, at its sole discretion, may perform its own survey and any discrepancies between the Engineer's survey and Contractor's survey shall be reconciled prior to commencement of any Work.
- 3.5.4. The volume of the fill shall be computed before and after surveying using 10m x 10m grid over the excavation area as per Drawings. Quantities computed for Common Fill shall be rounded to the nearest whole number.
- 3.5.5. No separate measurement and payment will be made for Common Fill where Contractor has over-excavated.

3.6. Fill (Rock)**(Pay item 0023, 0035, 0045)**

- 3.6.1. Payment for Rockfill shall be by the cubic meter based on the volume of Rockfill actually placed and in accordance with the principles set out in Sections 3.6.2 to 3.6.5 inclusive:
- 3.6.2. Measurement of Rockfill shall be based on the cross-section or approved equal sheets between the position of the ground lines before the Rockfill was placed and the completed and the accepted fill lines.
- 3.6.3. Prior to commencement of the Work the Contractor shall perform its own survey which shall be subject to the review and Acceptance of Engineer. The Contractor's survey shall define the "excavated state" of the Site and shall cover the area of permanent Work and the immediate vicinity. Engineer, at its sole discretion, may perform its own survey and any discrepancies between the Engineer's survey and Contractor's survey shall be reconciled prior to commencement of any Work.
- 3.6.4. The volume of the Rockfill shall be computed before and after surveying using 10m x 10m grid over the excavation area as per construction drawing. Quantities computed for the Rockfill shall be rounded to the nearest whole number.

3.6.5. No separate measurement and payment will be made for Rockfill where Contractor has over-excavated.

3.7. Fill (Borrow) Granular 300 mm Thick Surfacing

(Pay item 0024, 0036, 0046)

3.7.1. Payment for borrow fill shall be by the cubic meter based on the volume of borrow material actually in place and in accordance with the principles set out in Sections 3.7.2 to 3.7.5 inclusive:

3.7.2. Measurement of borrow fill shall be based on the cross-section or Approved equal sheets between the position of the ground lines before the borrow fill was placed and the completed and the accepted fill lines.

3.7.3. Prior to commencement of the Work the Contractor shall perform its own survey which shall be subject to the review and Acceptance of Engineer. The Contractor's survey shall define the "prepared state to grades" of the Site and shall cover the area of permanent Work and the immediate vicinity. Engineer, at its sole discretion, may perform its own survey and any discrepancies between the Engineer's survey and Contractor's survey shall be reconciled prior to commencement of any Work.

3.7.4. The volume of the fill shall be computed before and after surveying using 5m x 5m grid over the excavation area as per Drawings. Quantities computed for the borrow fill shall be rounded to the nearest whole number.

3.7.5. No separate payment shall be made for any royalties associated with obtaining the material from Newfoundland and Labrador Department of Natural Resources, or for access, clearing, grubbing and site rehabilitation of the borrow pit(s).

3.8. Slope Protection (Perimeter Rip Rap)

(Pay item 0025, 0037, 0047)

3.8.1. Payment for slope protection shall be by the square meter based on the area of slope protection actually installed and in accordance with the principles set out in Sections 3.8.2 to 3.8.5 inclusive:

3.8.2. Measurement of slope protection shall be based on the area of the slope of the yard end, completed and the accepted placement lines as per "Approved for Construction" Drawings. Quantities computed for the Slope Protection shall be rounded to the nearest whole number.

3.8.3. Prior to commencement of the Work the Contractor shall perform its own survey which shall be subject to the review and Acceptance of Engineer. The Contractor's survey shall define the "prepared state to grades" of the Site and shall cover the area of permanent Work and the immediate vicinity. Engineer, at its sole discretion, may perform its own survey and any discrepancies between the Engineer's survey and Contractor's survey shall be reconciled prior to commencement of any Work.

- 3.8.4. Work shall include excavation, grading, filling, hauling appropriate size of material from stockpiled site and placement of slope protection to the required dimensions and lines.
- 3.8.5. It is assumed that sufficient rip-rap material can be sorted from the blasted (excavated) rock produced on-Site. Payment for imported rip-rap, if required, shall be made in accordance with the Article 14 of this Agreement.

3.9. Access Road Design

(Pay item 0026)

- 3.9.1. This pay item will apply to the design access road(s) from the proposed layout as shown on Drawings. The payment for access road design shall be in accordance with the principles set out in Sections 3.9.2 to 3.9.4 inclusive:
- 3.9.2. The Contractor shall perform its own survey and propose a design and layout for the access road(s) which shall be subject to the review and Acceptance of Engineer.
- 3.9.3. This pay item shall include the design of access road including design and construction of acceleration and de-acceleration lanes and tapered sections required on TCH, Y intersection.
- 3.9.4. Payment for access road design shall be lump sum upon completion of the Contractor's design as Accepted by the Engineer.

3.10. Build Access Road

(Pay item 0027, 0048)

- 3.10.1. This pay item will apply to the construction of the access road(s) as shown on Approved Drawings. The payment for access road shall be in accordance with the principles set out in Sections 3.10.2 to 3.10.4 inclusive:
- 3.10.2. This pay item shall include asphalt paving, upgrading of median including asphalt paving, traffic control gates, guard rails, excavation (common and rock), backfill, supply and installation of culverts, surveys, site restoration, ditching, slope rehabilitation, environmental requirements (including temporary fence, silt control measures), signage and all other associated labour, material and equipment to complete the work.
- 3.10.3. No separate payment will be made for the Contractor's own construction purposes and for necessary bench excavation to comply with the minimum excavation line.
- 3.10.4. Payment for access road construction shall be lump sum based on earned construction progress (calculated by dividing the earned manhours to date for this pay item over the total estimated manhours for the pay item) as indicated in Appendix A – Schedule of Price Breakdown and as Approved by Company.

3.11. Subsurface Drain-Corrugated Metal Pipe Drain 600mm Diameter

(Pay item 0038)

- 3.11.1. Payment for subsurface drain shall be by the linear meter of corrugated metal pipe actually installed and in accordance with the principles set out in Sections 3.10.2 to 3.10.3 inclusive:
- 3.11.2. Prior to commencement of the Work the Contractor shall perform its own survey which shall be subject to the review and Acceptance of Engineer. The Contractor's survey shall define the "approved layout" and the length of the corrugated metal pipe required and shall cover the area of permanent Work and their immediate vicinity as specified. Engineer, at its sole discretion, may perform its own survey and any discrepancies between the Engineer's survey and Contractor's survey shall be reconciled prior to commencement of any Work.
- 3.11.3. This pay item shall include the supply and installation of geotextile, excavation, bedding, crushed stone, corrugated metal pipe, backfill, surveys, site restoration, environmental requirements, rip rap around outfall and all other associated labour, materials, and equipment to complete the Work.

3.12. Silt Sedimentation Control**(Pay item 0028)**

- 3.12.1. This pay item will apply to supply and installation of silt sedimentation control as shown on "Approved for Construction" Drawings, as suitable to the Site, and as approved by the Engineer.
- 3.12.2. Prior to commencement of the Work the Contractor shall perform its own survey which shall be subject to the review and Acceptance of Engineer. The Contractor's survey shall define the "approved layout" for the sedimentation control and shall cover the area of permanent Work and their immediate vicinity as specified. Engineer, at its sole discretion, may perform its own survey and any discrepancies between the Engineer's survey and Contractor's survey shall be reconciled prior to commencement of any Work.
- 3.12.3. This pay item shall include the supply and installation of geotextile for silt fence, sedimentation dams, periodic clean-up of the silt, excavation, bedding, backfill, surveys, site restoration, environmental requirements, rip rap as required and all other associated labour, materials, or equipment to complete the Work.
- 3.12.4. Payment for silt sedimentation control shall be based on overall earned construction progress as Approved by Company.

3.13. Site Water Management (Permanent Ditches)**(Pay item 0049)**

- 3.13.1. Payment for site water management shall be by the linear meter of permanent ditches installed as shown on "Approved for Construction" Drawing, as suitable to the Site, and

as Approved by the Engineer. The payment for the site water management shall be in accordance with the principles set out in Sections 3.12.2 to 3.12.3 inclusive:

3.13.2. Prior to commencement of the Work the Contractor shall perform its own survey which shall be subject to the review and Acceptance of Engineer. The Contractor's survey shall define the "approved layout" for the site water management measures and shall cover the area of permanent Work and their immediate vicinity as specified. Engineer, at its sole discretion, may perform its own survey and any discrepancies between the Engineer's survey and Contractor's survey shall be reconciled prior to commencement of any Work.

3.13.3. This pay item shall include the supply and placement of permanent ditching, periodic clean up during the work, excavation, bedding, backfill, surveys, site restoration, environmental requirements, rip rap as shown on drawings and as required, and all other associated labour, materials and equipment to complete the Work.

3.14. Clearing and Grubbing of Laydown/Stockpiling/Spoil Area

(Pay item 0029)

3.14.1. This pay item will apply to the clearing and grubbing of the proposed laydown, stockpiling, and/or spoil area(s) as indicated on "Approved for Construction" Drawings.

3.14.2. This pay item shall include access to the laydown area, placement of ditching, periodic clean up during the work, bedding, backfill, surveys, site restoration, environmental requirements, and all other associated labour, materials or equipment to complete the Work.

3.14.3. Payment for clearing and grubbing for laydown/stockpiling/spoil area shall be lump sum upon completion of the clearing and grubbing as per "Approved for Construction" Drawings and as Accepted by the Engineer.

3.15. Site Rehabilitation

(Pay item 0050)

3.15.1. Payment for site rehabilitation shall be by the square meter to supply and installation of "Terrafix Erosion Blanket" as an erosion protection measure as shown on "Approved for Construction" Drawing or as required by the Engineer.

3.16. Site Facilities for CD0501, CD0502 and CD0534

(Pay item 0030)

3.16.1. This pay item shall apply to site facility preparation work for CD0501, CD0502 and CD0534 as shown on "Approved for Construction" Drawings, as suitable to the Site, and as Accepted by the Engineer.

3.16.2. Prior to commencement of the Work the Contractor shall perform its own survey

which shall be subject to the review and Acceptance of Engineer. The Contractor's survey shall define the "approved layout" for the site facility preparation work and shall exclude the area of permanent Work and their immediate vicinity as specified. Engineer, at its sole discretion, may perform its own survey and any discrepancies between the Engineer's survey and Contractor's survey shall be reconciled prior to commencement of any Work.

- 3.16.3. This pay item shall include clearing and grubbing of the three (3) sites, access road, supply and placement of permanent ditching, drainage, culvert, periodic clean up during the work, excavation, bedding, backfill, compaction, surveys, site restoration, maintenance gravel, environmental requirements, rip rap as required, and all other associated labour, materials and equipment to complete the Work.
- 3.16.4. Payment for site facilities shall be lump sum upon completion of the preparation of the three (3) sites, 100 m x 100m each, as per the "Approved for Construction" Drawings and as Accepted by the Engineer.

3.17. N-E Pond Draining (and changing to settling pond)

(Pay item 0039)

- 3.17.1. This pay item shall apply to draining the existing pond, preparing the partial area for site preparation and modifying the remaining area as settling pond for water management of the site as specified in the Technical Specifications. Draining of the N-E pond shall be as shown on "Approved for Construction" Drawings, as suitable to the Site, and as Accepted by the Engineer.
- 3.17.2. This item shall include incidental clearing and grubbing, access road, supply and placement of permanent ditching, drainage, culvert, periodic silt accumulation clean up during the work, excavation, bedding, backfill, compaction, surveys, site restoration, maintenance gravel, environmental requirements, rip rap as required and all other associated labour, material, and equipment to complete the work.
- 3.17.3. Payment for the pond draining shall be lump sum upon completion of the pond draining as detailed in the Technical Specification and as Accepted by the Engineer.

EXHIBIT 2 - APPENDIX B

NOT USED

EXHIBIT 2 - APPENDIX C
PERSONNEL RATE SCHEDULE

Rates for Island of Newfoundland (Effective May 1, 2013)

Trade or Classification (1)	Base Rate (2)	Vacation Pay (3)	Payroll Allow. and Burdens (4)	Small Tools (5)	Cons. and PPE (6)	Overhead & Profit (7)	Regular Time Rate (8) (CDN\$)	Overtime Rate (1.5x) (CDN\$)	Overtime Rate (2.0x) (CDN\$)	Second and Third Shift Premium (CDN\$)
Journeyman Civil (Carpenter)	\$30.50	\$3.97	\$27.11	\$4.00	\$4.00	\$8.35	\$77.92	\$104.70	\$139.49	\$4.28
Civil Apprentice (4 th year)	\$27.45	\$3.57	\$26.67	\$4.00	\$4.00	\$7.88	\$73.57	\$98.42	\$131.26	\$4.28
Civil Foreman (Non-Working)	\$33.75	\$4.39	\$27.57	\$4.00	\$4.00	\$8.84	\$82.55	\$111.40	\$148.26	\$4.28
Civil Foreman (Working)	\$32.50	\$4.23	\$27.39	\$4.00	\$4.00	\$8.65	\$80.77	\$108.83	\$144.88	\$4.28
Journeyman Electrician	\$34.86	\$4.53	\$27.73	\$4.00	\$4.00	\$9.01	\$84.13	\$113.69	\$151.25	\$4.28
Electrician Apprentice (4 th year)	\$31.37	\$4.08	\$27.23	\$4.00	\$4.00	\$8.48	\$79.16	\$106.51	\$141.85	\$4.28
Electrician Foreman (Non-working)	\$38.11	\$4.95	\$28.19	\$4.00	\$4.00	\$9.51	\$88.76	\$120.39	\$160.02	\$4.28
Electrician Foreman (working)	\$36.86	\$4.79	\$28.01	\$4.00	\$4.00	\$9.32	\$86.98	\$117.81	\$156.65	\$4.28
Journey Mechanical I (IW/PF)	\$34.00	\$4.42	\$27.60	\$4.00	\$4.00	\$8.88	\$82.91	\$111.92	\$148.93	\$4.28
Mechanical Apprentice (4 th year)	\$30.60	\$3.98	\$27.12	\$4.00	\$4.00	\$8.36	\$78.06	\$104.91	\$139.76	\$4.28
Mechanical Foreman (non-working)	\$37.25	\$4.84	\$28.07	\$4.00	\$4.00	\$9.38	\$87.54	\$118.62	\$157.70	\$4.28
Mechanical I Foreman (working)	\$36.00	\$4.68	\$27.89	\$4.00	\$4.00	\$9.19	\$85.76	\$116.04	\$154.33	\$4.28
Journeyman Mechanical II (MW/Ins)	\$32.00	\$4.16	\$27.32	\$4.00	\$4.00	\$8.58	\$80.06	\$107.80	\$143.54	\$4.28
Mechanical II Apprentice (4 th year)	\$28.80	\$3.74	\$26.86	\$4.00	\$4.00	\$8.09	\$75.50	\$101.20	\$134.90	\$4.28
Mechanical II Foreman (non-working)	\$35.25	\$4.58	\$27.78	\$4.00	\$4.00	\$9.07	\$84.69	\$114.50	\$152.30	\$4.28
Mechanical II Foreman (working)	\$34.00	\$4.42	\$27.60	\$4.00	\$4.00	\$8.88	\$82.91	\$111.92	\$148.93	\$4.28
Heavy Duty Mechanic	\$32.00	\$4.16	\$27.32	\$4.00	\$4.00	\$8.58	\$80.06	\$107.80	\$143.54	\$4.28
Crane Operator	\$33.50	\$4.36	\$27.53	\$4.00	\$4.00	\$8.81	\$82.19	\$110.89	\$147.58	\$4.28
Heavy Equipment Operator	\$29.00	\$3.77	\$26.89	\$4.00	\$4.00	\$8.12	\$75.78	\$101.61	\$135.44	\$4.28
Apprentice Operator (4 th year)	\$26.10	\$3.39	\$26.48	\$4.00	\$4.00	\$7.68	\$71.65	\$95.63	\$127.62	\$4.28
OE Foreman (non-working)	\$32.25	\$4.19	\$27.35	\$4.00	\$4.00	\$8.62	\$80.41	\$108.31	\$144.21	\$4.28
OE Foreman (working)	\$31.00	\$4.03	\$27.18	\$4.00	\$4.00	\$8.42	\$78.63	\$105.73	\$140.84	\$4.28
Light Equipment Operator (4 th year)	\$28.00	\$3.64	\$26.75	\$4.00	\$4.00	\$7.97	\$74.36	\$99.55	\$132.74	\$4.28
Blaster/Driller/Compressor Operator	\$29.00	\$3.77	\$26.89	\$4.00	\$4.00	\$8.12	\$75.78	\$101.61	\$135.44	\$4.28
Mechanic Helper	\$26.18	\$3.40	\$26.49	\$4.00	\$4.00	\$7.69	\$71.76	\$95.80	\$127.83	\$4.28
Utility Person (Labourer)	\$25.18	\$3.27	\$26.35	\$4.00	\$4.00	\$7.54	\$70.34	\$93.74	\$125.14	\$4.28
Utility Foreman (non-working)	\$28.43	\$3.70	\$26.81	\$4.00	\$4.00	\$8.03	\$74.97	\$100.44	\$133.90	\$4.28
Utility Foreman (working)	\$27.18	\$3.53	\$26.63	\$4.00	\$4.00	\$7.84	\$73.19	\$97.86	\$130.53	\$4.28
Storekeeper	\$27.13	\$3.53	\$26.62	\$4.00	\$4.00	\$7.83	\$73.12	\$97.76	\$130.40	\$4.28
Surveyor	\$33.75	\$4.39	\$27.57	\$4.00	\$4.00	\$8.84	\$82.55	\$111.40	\$148.26	\$4.28

Rates for Island of Newfoundland (Effective May 1, 2014)

Trade or Classification (1)	Base Rate (2)	Vacation Pay (3)	Payroll Allow. and Burdens (4)	Small Tools (5)	Cons. and PPE (6)	Overhead & Profit (7)	Regular Time Rate (8) (CDN\$)	Overtime Rate (1.5x) (CDN\$)	Overtime Rate (2.0x) (CDN\$)	Second and Third Shift Premium (CDN\$)
Journeyman Civil (Carpenter)	\$32.71	\$4.25	\$29.07	\$4.00	\$4.00	\$8.88	\$82.92	\$111.93	\$148.95	\$4.28
Civil Apprentice (4 th year)	\$29.44	\$3.83	\$28.60	\$4.00	\$4.00	\$8.38	\$78.25	\$105.19	\$140.12	\$4.28
Civil Foreman (Non-Working)	\$36.21	\$4.71	\$29.57	\$4.00	\$4.00	\$9.42	\$87.90	\$119.15	\$158.39	\$4.28
Civil Foreman (Working)	\$34.96	\$4.54	\$29.39	\$4.00	\$4.00	\$9.23	\$86.12	\$116.57	\$155.02	\$4.28
Journeyman Electrician	\$37.07	\$4.82	\$29.69	\$4.00	\$4.00	\$9.55	\$89.13	\$120.92	\$160.71	\$4.28
Electrician Apprentice (4 th year)	\$33.36	\$4.34	\$29.16	\$4.00	\$4.00	\$8.98	\$83.85	\$113.28	\$150.71	\$4.28
Electrician Foreman (Non-working)	\$40.57	\$5.27	\$30.19	\$4.00	\$4.00	\$10.08	\$94.12	\$128.14	\$170.15	\$4.28
Electrician Foreman (working)	\$39.32	\$5.11	\$30.01	\$4.00	\$4.00	\$9.89	\$92.34	\$125.56	\$166.78	\$4.28
Journey Mechanical I (IW/PF)	\$36.21	\$4.71	\$29.57	\$4.00	\$4.00	\$9.42	\$87.90	\$119.15	\$158.39	\$4.28
Mechanical Apprentice (4 th year)	\$32.59	\$4.24	\$29.05	\$4.00	\$4.00	\$8.87	\$82.74	\$111.68	\$148.62	\$4.28
Mechanical Foreman (non-working)	\$39.71	\$5.16	\$30.07	\$4.00	\$4.00	\$9.95	\$92.89	\$126.36	\$167.83	\$4.28
Mechanical I Foreman (working)	\$38.46	\$5.00	\$29.89	\$4.00	\$4.00	\$9.76	\$91.11	\$123.79	\$164.46	\$4.28
Journeyman Mechanical II (MW/Ins)	\$34.21	\$4.45	\$29.28	\$4.00	\$4.00	\$9.11	\$85.05	\$115.02	\$153.00	\$4.28
Mechanical II Apprentice (4 th year)	\$30.79	\$4.00	\$28.80	\$4.00	\$4.00	\$8.59	\$80.18	\$107.97	\$143.77	\$4.28
Mechanical II Foreman (non-working)	\$37.71	\$4.90	\$29.78	\$4.00	\$4.00	\$9.65	\$90.04	\$122.24	\$162.44	\$4.28
Mechanical II Foreman (working)	\$36.46	\$4.74	\$29.60	\$4.00	\$4.00	\$9.46	\$88.26	\$119.66	\$159.07	\$4.28
Heavy Duty Mechanic	\$34.21	\$4.45	\$29.28	\$4.00	\$4.00	\$9.11	\$85.05	\$115.02	\$153.00	\$4.28
Crane Operator	\$35.71	\$4.64	\$29.50	\$4.00	\$4.00	\$9.34	\$87.19	\$118.12	\$157.04	\$4.28
Heavy Equipment Operator	\$31.21	\$4.06	\$28.86	\$4.00	\$4.00	\$8.65	\$80.78	\$108.84	\$144.90	\$4.28
Apprentice Operator (4 th year)	\$28.09	\$3.65	\$28.41	\$4.00	\$4.00	\$8.18	\$76.33	\$102.41	\$136.48	\$4.28
OE Foreman (non-working)	\$34.71	\$4.51	\$29.36	\$4.00	\$4.00	\$9.19	\$85.77	\$116.06	\$154.34	\$4.28
OE Foreman (working)	\$33.46	\$4.35	\$29.18	\$4.00	\$4.00	\$9.00	\$83.99	\$113.48	\$150.97	\$4.28
Light Equipment Operator (4 th year)	\$30.21	\$3.93	\$28.71	\$4.00	\$4.00	\$8.50	\$79.35	\$106.78	\$142.20	\$4.28
Blaster/Driller/Compressor Operator	\$31.21	\$4.06	\$28.86	\$4.00	\$4.00	\$8.65	\$80.78	\$108.84	\$144.90	\$4.28
Mechanic Helper	\$28.39	\$3.69	\$28.45	\$4.00	\$4.00	\$8.22	\$76.76	\$103.03	\$137.29	\$4.28
Utility Person (Labourer)	\$27.39	\$3.56	\$28.31	\$4.00	\$4.00	\$8.07	\$75.33	\$100.97	\$134.60	\$4.28
Utility Foreman (non-working)	\$30.89	\$4.02	\$28.81	\$4.00	\$4.00	\$8.61	\$80.32	\$108.18	\$144.04	\$4.28
Utility Foreman (working)	\$29.64	\$3.85	\$28.63	\$4.00	\$4.00	\$8.42	\$78.54	\$105.60	\$140.67	\$4.28
Storekeeper	\$29.34	\$3.81	\$28.59	\$4.00	\$4.00	\$8.37	\$78.11	\$104.99	\$139.86	\$4.28
Surveyor	\$36.21	\$4.71	\$29.57	\$4.00	\$4.00	\$9.42	\$87.90	\$119.15	\$158.39	\$4.28

NOTES

Column 1: Trades and specialities required for the execution of the Work.

Column 2: Base rate is per the Lower Churchill Project Transmission Construction Collective Agreement between Lower Churchill Transmission Construction Employers' Association Inc. and International Brotherhood of Electrical Workers and IBEW Local Union 1620.

Column 3: Vacation pay includes vacations, statutory holidays, sick and other leave with pay.

Column 4: Payroll allowances and burdens includes, but not limited to, unemployment insurance, workers' compensation, payroll tax, and other taxes and insurance measured by payroll, established employee benefits such as pension, health, and life insurance, bonus programs, fringe benefits, indemnity funds, training, and all other contributions or premiums as per the construction decree or any other labour agreements or government regulations, as applicable.

Column 5: Small Tools includes all tools with a replacement value of less than two thousand (\$2,000.00) Canadian Dollars. Refer to Attachment 1, Item 3 for a typical listing of these types of small tools. Such items shall be furnished by the Contractor complete with all accessories and expendable operating parts and shall be maintained in good condition including the replacement of parts as may be necessary.

Column 6: Consumables whether recoverable or non-recoverable (refer Attachment 1, Item 2) and Personal Protective Equipment (refer Attachment 1, Item 1).

Column 7: Overhead and Profit includes, but not limited to, all home/corporate office expenses, administration (Health and Safety Supervisors, Planners, Project Controls, Estimators, etc.) and supervision (Project Manager, Superintendent) costs.

Column 8: The Regular Time rate includes the total of columns 2 to 7.

Overtime rates (1.5x and 2.0x) include the regular time rate plus the overtime premium as per the applicable labour agreement. Only the costs relative to those benefits and/or burdens that specifically apply when additional hours are worked shall be added. Other benefits, burdens and overhead will not be reimbursed since the full costs to the Contractor for these items has already been compensated in the regular time rate.

Second and Third Shift Premium is the incremental charge applied to the Regular Time Rate and Overtime Rates for second and third shift personnel.

The payroll burden rates expressed in dollars in this Schedule may be revised annually as necessary to reflect changes in statutory and other allowances. The Company reserves the right to verify the established dollar values and revisions thereto. In the event the Contractor has over recovered on its payroll burden costs, the Contractor shall refund the difference between the actual and assumed costs for payroll burden and make the necessary adjustments to this Schedule. Changes to the non-statutory allowances require Company's prior Approval.

ATTACHMENT 1

The following lists include, but are not limited to, items that Company classifies as "Personal Protective Equipment", "Consumables", and "Small Tools", whether recoverable or non-recoverable.

1. PERSONAL PROTECTIVE EQUIPMENT

All personal protective equipment shall meet the requirements of Occupational Health and Safety Regulations.

APRON, WELDERS	HALF FACE or FULL FACE RESPIRATOR WITH CARTRIDGES – ALL TYPES
BELT, SAFETY	HARD HAT
BLANKET, FIRE	HEARING PROTECTION
BLOCK, WELDING HELMET	HOOD, WELDING
BOOT, SAFETY, ALL TYPES	INSECTICIDE
BRACKET, FOR FACE SHIELD	LANYARD FOR SAFETY BELTS
BRACKET, FIBER BROW, SAFETY SHIELD	LENS, WELDING
CAPS, PLASTIC SAFETY (FOR REBAR)	LIFE LINE
CURTAIN, WELDER	LOCKS
DUST MASK	MOUNTING VISOR AND KWIK-KLIP
DISPOSABLE MASK	PULLER, FUSE SAFETY
EYESHIELD, FOR BENCH GRINDER	RAIN WEAR, JACKET AND OVERALLS
FIRST AID SUPPLIES	SAFETY HARNESS
FLARE, ROAD, NON-ELECTRIC	SIREN, ELECTRIC
GLASSES, SAFETY	STRAP, CHIN
GLOVES, WORK, ALL TYPES	SWEAT BANDS
GOGGLES, SAFETY	TABLET, SALT
GUARDS, SHIN	VISOR, SHIELD, CLEAR
GUARDS, TOE, METAL W/STRAP	WELDING SHIELDS

2. CONSUMABLES

ABRASIVES	EXPANDER, TUBEROLLS	AND	PAD, POLISHING	WASHERS
ACID	MANDRELS		PADLOCKS	WASHING POWDER
ADAPTORS, TOOL – all types	FASTENERS		PAINT (for erection marking)	WASHROOM SUPPLIES
ADHESIVE	FEELER STOCK		PAINT STICK	WASTE – Cotton
ALCOHOL	FILE, METAL CUTTING		PAN, DRAIN	WATER CANS
ANTIFREEZE	FILE, WOOD CUTTING		PAPER – sand, toilet	WELD ROD
ANTI-SPLATTER SPRAY	FILTER – for vacuum cleaner		PASTE – solder	WELDING GASES
APRON, WELDERS	FILTERS		PATTERNS	WHEEL, DEPRESSED CENTER
ARBORS, HOLE SAW	FISHTAPE, HAND		PENCIL, CARPENTER	WHEELBARROW, All Types
AUGER, HAND - post hole digger	FITTINGS, ALEMITE & HOSE		PENS, WRITING, MARKING	WHEEL ABRASIVE
BADGES	FLAMBEAU, KEROSENE		PETROLEUM JELLY	WHEEL, WIRE
BAG, DUST – for belt sander	FLASHLIGHT		PICK, CLAY	WICKS, LANTERN
BAG, BOLT	FLINT		PLUG, PIPE TEST	WIRE - tie & miscellaneous
BANDS, SAFETY HAT	FLUID CLEANING		PLUNGER, BATHROOM	WOOL – steel
BARRELS, WATER or TRASH	FLUX - brazing, welding		POCKET, LINEMAN'S	WRAP AROUNDS
BATTERY – flashlight and lantern	FORK, SEED		POUCH, CANVAS	
BELTING, BELT DRESSING	FORM TIES		POUCH, ROD	
BINS, TRASH	FRAME, HACKSAW		POWDER, SCOURING	
BITS – small hand tool, all types	FUELS (for construction equipment)		PULLER, WIRE	
BLADES – small hand tool, all types	FUNNELS, ALL TYPES		PUMICE	
BLANKET – wool, rubber	FUSE (except for permanent plant use)		PUNCH AND CHISEL SETS	
BOX, CARDBOARD	GARBAGE BAGS		PUNCH, CONDUIT	
BRACKET, FLOAT HANDLE	GASKETS, HOSE		PUNCH, PIN SET	
BRICK, RUBBING	GLOVES, WORK, all types		PUTTY	
BROOM – all types	GLUE		RAGS	
BRUSH – all types	GLYCERINE		RAKE, GARDEN	
BUCKET – all types	GOGGLES, WORK, all types		RAKE, CONCRETE	
BULB – blow out, dust	GRAPHITE		RAKE, ROAD	
BULB – flashlight, lantern, light	GREASE		REAMER, TAPER PIN (Hand Only)	
BURLAP	GRIPS, PLASTIC for pliers		RIGGING HOOKS	
CABLES, RIGGING	GROMMETS		ROPE, MANILA	
CAN, OIL	GUIDE, HINGE-BUTT for router		ROPE, POLYPROPYLENE	
CAN, SAFETY	GUN, CAULKING		ROPE, WIRE	
CARBIDE	GUN, GREASE		RULE - Extension, Wood, Fiberglass,	
CARBORUNDUM – Blocks, Stones Walk	HASPS		Folding	
CHAIN, SAFETY	HATCHET		RULE, TAPE	
CHAIN, LOADBINDER	HINGES		RUST PREVENTIVE	
CHALK	HOE		SANDBLAST NOZZLES	
CHALK LINE BOX	HOOK, SNAP		SCISSORS, ELECTRICIAN	
CHAMOIS	HOOK, TIMBER		SCRAPER, HAND	
CHARCOAL AND COKE	HOSE, AIR, ¾" /Dia. Max. (Air Tools		SCRAPER, SIDEWALK	

CHISEL – all types	Only)	SCRAPER, WALL
CHOKER – all types	HOSE WATER to ¾”	SCREEN CLOTH – Wire
CHUCKS, TOOL – all types	HOSE, GREASE, GUN	SCREW RUNNER
CLAMP, CABLE	HOSE, TWIN WELDING	SCREW STARTER
CLAMP, HOSE	ICE	SCREWDRIVER, All Types
CLEANER, DRAIN	INK, LAYOUT – for Millwrights	SHACKLES
CLEANER, HAND	IRON, CAULKING	SHEATH, PLUMB BOB
CLEANER, TIP	IRON, PACKING	SHIMS
CLIPS, WIRE ROPE	IRON, YARNING	SILICONE SPRAY
CLOTH, DROP, PAINTER’S	JAW, BOLT CUTTER REPLACEMENT	SOAP
CLOTH, EMERY	JITTERBUG – Concrete Hand	SOAP STONE
CLOTH, STRAINING	JOINT RUNNER	SOLDER
COAL and COKE	KEEL (lumber crayon)	SOLVENT
COMPOUND - cleaning, pipe, thread grinding	KEY, CHUCK	SPONGE
COMPOUND, SWEEPING	KEY, EJECTOR for Roto Hammers	STAKE - survey
COMPOUND, WIRE PULLING	KEY, HEX	STAPLES
CONNECTORS – Cord, Cotter Pins	LASHING, WIRE ROPE	STRING, NYLON
CORD, PLUMB BOB	LATCHES	TACKS
CORD, SASH	LATTERNS, 6 VOLT LENS - Welding	TAG, BLANK, WIRE TWIST
CORK	LIGHTER, SPARK	TARPAULIN
CRAYON, LUMBER	LIME, MARKING	TAP, TAPER, HAND
CRAYON – Temperature Indicating	LINE, FISH	TAPE - adhesive, masking, friction, rubber, plumbers, etc.
CREOSOTE	LITHARGE	TEMPIL STICKS
CUP – drinking	LUBRICANT – thread cutting, electric wire pulling	THIMBLES, WIRE ROPE
CUTTER WHEELS – tools, all types	LUGS	TIP, TORCH WELDING
DIE NUTS – Hexagon Rethread	MARKER, METAL	TOOL BOXES, BINS
DIES, BUTTON	MARKER, PIPE CONTOUR	TOOL, BRUSHING for Vacuum cleaner
DIES, KNOCKOUT	MENDERS, HOSE	TOOL, CREVICE, 15” for Vacuum
DIES, PIPE – for Hand Threaders Only	MIRROR, INSPECTION	TOOL, MAJOR FLOOR, 14”
DIES, TMB – 8, Compression Tools	MOP	TOOL STEEL
DIPPERS	NAILS	TOWEL – Paper
DISC, GRINDING	NIPPLES, HOSE	TORCH, HEATING
DISINFECTANT	NOZZLE, WATER	TORCH, CUTTING
DISPENSER, PAPER CUP	NUT RUNNER	TROWEL, HAND
DRESSING, BELT	NUT SETTER	TRUNBUCKLES
DRILL BIT – Small Hand Tool, All Types	OFFICE SUPPLIES	TURPENTINE
EDGER, CONCRETE HAND	OIL - all types	TWINE
ELECTRODE HOLDERS	PACKING MATERIAL	VISQUEEN – Non-reinforced

3. SMALL TOOLS

ADAPTER - hose, pipe thread	DOOR HANGING KIT	MOVER - freight car, hand	SOLDERING IRON
ADZE	DRESSER - grinding wheel	NAILER, AIR	SPADE
ANVIL	DRILL - all types: hand, electric,	NIBBLER, SHEET METAL	SPEED, PORTABLE
APRON	pneumatic	NIPPER	SPIKE- marlin
ARBOUR	DRILL PRESS	NOTCHER, PIPE	SPRAYER, ORCHARD
AUGER, GASOLINE (Post Hole Digger)	DRILL STAND - bench	NOZZLE - hose, weld	SPREADER, FLANGE
AWL	DYNAMOMETER	NUT - die, driver	SQUARE- combination, framing, etc.
AXE	ELCOMETER - paint thickness gauge	OILER - can, hand	SQUEEGEE
BABBITT	EMBOSSER, TAPE, HAND	OVEN - welding rod	STAND, DRILL
BANDING MACHINE – Hand Type	ETCHER, ELECTRIC	PAIL	STAND, GRINDER
BAR- claw, crow, pinch, etc.	EXPANDER- tube	PEDESTAL, GRINDER	STAND, PIPE
BARREL- trash	EXTENSION, SOCKET SET	PIN, BARREL	STAND, REEL, TELESCOPING SCREW
BASE, MAGNETIC/DAILY TEST	EXTENSION CORD	PIN, BULL	STAPLE- tacker
INDICATOR	EXTRACTOR - pipe & screw	PIN, DRAFT	STAPLER, ELECTRIC OR HAND
BELT- safety w/strap	FAN - electric	PINCER	STAR DRILL
BENDER - hydraulic, manual	FILE - hand	PLANE – wood	STEAM HEATER
BENDER, CABLE	FLARING TOOL	PLANE, BENCH JACK	STENCIL- steel, brass, paper
BENDER, PIPE	FLASHLIGHT - c/w bulb & batteries	PLANE, BLOCK	STONE - OIL
BENDER, TUBING	FLATTER - blacksmith	PLANE, ELECTRIC	STRAIGHT EDGE
BENDER, LOAD	FLOAT, CONCRETE – Hand Only	PLANE, VERSI	STRAINER- air line
BEVEL	FORGE - blacksmith	PLANNER, POWER BLOCK – Electric HD	STRAPPER
BEVELLER - load	FORK - barn	PLIERS – all types	STRIPPER- wire
BINDER - load	FULLER - blacksmith	PLUMB BOB	SUPPORT, PIPE – Roller type
BIT - auger, carpenter	FURNACE, PROPANE – Melting	POINT - trammel	SWEDGING TOOL KIT
BLOCK - chain, rope, cable, etc.	GAD	POLE - pike, range	SWIVEL
BLOCKS, WOOD	GAUGE- drill, feeler, wire thickness,	POT - melting, fire, welding rod, lead	TACHOMETER
BLOCKS, METAL – Snatch	tire, etc.	POUCH - tool	TAMPER- hand, pneumatic
BLOWER – Pneumatic Powered	GRINDER- electric, pneumatic	PRESTOLITE OUTFIT	TANK, LP – 20# only
BOB, PLUMB	GRAB, PIPE OF 20"	PROTRACTOR	TAP- bolt, pipe, wrench
BOSUN CHAIRS	GRINDER, ELECTRIC	PULLER, FUSE SAFETY	TAPE- steel measuring
BOX - tool box or tool bag	GRIP- cable	PULLER, WHEEL GEAR	TAPEWRITER, EMBOSSING –
BOX, GANG (Craft Storage)	GROOVING, TOOL	PULLER- nail, wire, spike road	Hand type
BRACE - ratchet	GUN- grease caulking, paint, heat	PULLEY, CABLE	TAPPER
BROOMS	(115V), pop rivet, powder actuated,	PULLEY, WELL	TELEPHONE- hand set, electrician's
BURNER, WEED	soldering	PUMP- hand, barrel, sump, test	testing
CABLE - welding, electrode, ground,	HACKSAW, POWER	PUNCH- center, back out, arch,	TEMPLATE, HINGE-BUTT
etc.	HAMMERS - all types: pneumatic, hand	knockout, hob, gasket, sheet metal,	TESTER- battery, hardness, antifreeze,
CALLIPERS	HANDLES - all types	stud, etc.	circuit, insulation, motor rotation, etc.
CANS	HATCHET & HANDLE - for hand	RADIO- portable, 2 way, intercom	THIMBLE- pipe
CART - concrete	threader sets	RASP	THREADER- pipe chain, etc.
CART, WELDING BOTTLE 2	HATCHET, WRENCH	REAMER- pipe, bridge burring, etc.	TONGS, BRICK CARRIER

CASTERS	HEATER - portable: fuel, electric (115V), LP, Kerosene	REAMER, INNER, OUTER – for copper tubing	TONGS, CHAIN
CAULKING TOOL - yarning iron	HOD - brick, mortar	REAMER, SPIRAL – Pipe only	TONGS, PIPE
CENTER FINDER SET - Wiggler	HOE	REAMER, STRAIGHT – Pipe only	TONGS, SHEET METAL
CHAIN - surveyor, measuring, steel loading	HOIST - portable, all types	REEL, TIE WIRE	TONG- blacksmith, pipe,
CHAIR, BOSUN'S	HOOD - welding, sandblasting	REGULATOR- welding gas	TOOL, FLARING
CHARGER - battery	HOOK - packing, eye, cant, lug, etc.	RESPIRATOR- dusts c/w refill	TOOL, PICK UP, MAG
CHUCK - taper, drill	HORSES - mason, saw	RIGGERS ROPE- manila, wire	TOOL, SOIL PIPE ASSEMBLY
CLAMP - pipe, aligning, saw, carpenter, etc.	INDICATOR - dial, test	RIVERTER, HAND	TOOL- clamping (hose)
CLIMBER – Adjustable w/Pad and Straps	IRON - tire	ROLLER, PIPE	TOOLS- cement worker
CLIPPER - bolt	JACK - flange, hydraulic, mechanical, screw	ROLLER, paint	TORCH- blow, soldering
COOLER - drinking water	JIG - weld coupon bending test	ROUTER, ELECTRIC	Cutting, propane, acetylene, prestolite
COMBINATION SETS – 6” to 18”	KEY - welding, gas tank	RULES- all types	TRANSFORMER- dry type
CONNECTOR - welding, cable	KNIFE - draw, putty	RUSH DRILL	TROLLEY
CONVEYOR - gravity, roller	KNOCKOUT, HAND	SANDER- disc, belt	TROWEL
CORD - electric extension	LADDER - steel, extension, etc.	SAW - portable, all types: hand, power	TRUCK- hand
COUPLING - hose	LADLE - melting, lead	SCALER, NEEDLE	TURNBUCKLE
CREEPER, FLOOR	LANTERNS - all types	SCRAPER- bearing, miscellaneous	TWISTER- wire
CRIMPER, BAND	LEAD JOINT RUNNER	SCREW STOP	UMBRELLA
CRIMPER - electrician's	LEVEL - hand, line, etc.	SCREW PLANE (set)	UNIVERSAL – for socket sets
CRIMPING TOOL - Wire	LIGHT - portable, flood, drop	SCRIBER SET- nail, rivet	VACUUM CLEANER, HD
CUTTER - bar, wire, pipe-hand, pipe-gear, gasket, etc.	LINE - mason, chalk	SHARPENER, DRILL BIT	VIBRATOR, CONCRETE- pneumatic, Electric
CYLINDER, HYDRAULIC – for Porta Powers	LUBRICATOR - air line	SHEAR- bar, tinners	WISE, MACHINIST
DIE- pipe, bolt, c/w head, stock	MALLET	SHEAR, ANGLE IRON	WISE, PIPE
DIGGER - hand, pneumatic	MANDREL - all types	SHEARS, ELECTRIC, HAND	WEDGE
DIVIDER – wing	MARKER, LIME, ROLLING	SHEARS, TRIMMING, ROTARY	WELDING TOOLS
DIVIDER, SPRING TYPE	MATTOCK	SHEAVES, CABLE, TRAY METAL	WELDING & CUTTING OUTFIT (Oxy/Acetylene)
DOLLY, BARREL	MAUL	SHEETING- plastic, paper	WHEEL- grinding
DOLLY, BEAM	MEGGER METER	SHIELD- face	WHEELBARRROW
DOLLY, CATERPILLAR	METER - vibration	SHOVEL	WINCH- hand
DOLLY, MACHINE	METER, AMP – Clamp-on w/Case	SIREN, ELECTRIC	WRENCHES- all types
DOLLY, PIPE	METER, MILLIVOLT	SLEEVE- morse, taper, shank	
DOLLY, PRY	METER, MOISTURE	SLING- canvas, pipe, wire, rope, nylon	
DOLLY, WAREHOUSE	METER, VOLT	SNIP- tinner	
DOLLY BAR - pivot	MICROMETER	SNIPS, AVIATION, HAND	
	MIRROR, INSEPTION	SNIPS, METAL CUT, HAND	
	MITER BOX – Electric or hand	SNIPS, TRIM HAND	
	MORTISER, LOCK - Electric	SOCKET for hand tools only	
		SOCKET SET	

EXHIBIT 2 - APPENDIX D
EQUIPMENT RATE SCHEDULE

*All rates are in CDN\$

Equipment Type	Manufacturer and Model Number	Size	Year	Quantity Available	First Shift				Second Shift			
					Hour	Day	Week	Month	Hour	Day	Week	Month
Excavator	CAT 336	2 m3		Unlimited	\$151.00	\$1,510.00	\$10,570.00	\$45,300.00	\$151.00	\$1,510.00	\$10,570.00	\$45,300.00
Excavator	CAT 345	3 m3		Unlimited	\$217.00	\$2,170.00	\$15,190.00	\$65,100.00	\$217.00	\$2,170.00	\$15,190.00	\$65,100.00
Excavator	CAT 374	4.5 m3		Unlimited	\$331.00	\$3,310.00	\$23,170.00	\$99,300.00	\$331.00	\$3,310.00	\$23,170.00	\$99,300.00
Excavator	CAT 385ME	5.5 m3		Unlimited	\$442.00	\$4,420.00	\$30,940.00	\$132,600.00	\$442.00	\$4,420.00	\$30,940.00	\$132,600.00
Loader	CAT 966G	4 m3		Unlimited	\$135.00	\$1,350.00	\$9,450.00	\$40,500.00	\$135.00	\$1,350.00	\$9,450.00	\$40,500.00
Loader	CAT 980	5.5 m3		Unlimited	\$289.00	\$2,890.00	\$20,230.00	\$86,700.00	\$289.00	\$2,890.00	\$20,230.00	\$86,700.00
Grader	CAT 14H	220 hp		Unlimited	\$153.00	\$1,530.00	\$10,710.00	\$45,900.00	\$153.00	\$1,530.00	\$10,710.00	\$45,900.00
Off-Highway Truck	CAT 740 Artic	40 ton		Unlimited	\$201.00	\$2,010.00	\$14,070.00	\$60,300.00	\$201.00	\$2,010.00	\$14,070.00	\$60,300.00
Dozers	CAT D6R	6 m3		Unlimited	\$138.00	\$1,380.00	\$9,660.00	\$41,400.00	\$138.00	\$1,380.00	\$9,660.00	\$41,400.00
Dozers	CAT D8N	10 m3		Unlimited	\$239.00	\$2,390.00	\$16,730.00	\$71,700.00	\$239.00	\$2,390.00	\$16,730.00	\$71,700.00
Compactor	Plate Compactor	1000 lb		Unlimited	\$27.00	\$270.00	\$1,890.00	\$8,100.00	\$27.00	\$270.00	\$1,890.00	\$8,100.00
Compactor	Bomag 65	Double Drum		Unlimited	\$29.00	\$290.00	\$2,030.00	\$8,700.00	\$29.00	\$290.00	\$2,030.00	\$8,700.00
Compactor	CAT CS563	10 Ton		Unlimited	\$84.00	\$840.00	\$5,880.00	\$25,200.00	\$84.00	\$840.00	\$5,880.00	\$25,200.00
Drills	Gardner Denver SCH-3500BV Hydra-Trac			Unlimited	\$243.00	\$2,430.00	\$17,010.00	\$72,900.00	\$243.00	\$2,430.00	\$17,010.00	\$72,900.00
Drills	Gardner Denver SCH-5000 Hydra-Trac			Unlimited	\$401.00	\$4,010.00	\$28,070.00	\$120,300.00	\$401.00	\$4,010.00	\$28,070.00	\$120,300.00
Cranes	Boom Truck 25T	25 Ton		Unlimited	\$122.00	\$1,220.00	\$8,540.00	\$36,600.00	\$122.00	\$1,220.00	\$8,540.00	\$36,600.00
Generator	Generator-15KW	15 Kw		Unlimited	\$27.00	\$270.00	\$1,890.00	\$8,100.00	\$27.00	\$270.00	\$1,890.00	\$8,100.00
Generator	Generator-35KW	35 Kw		Unlimited	\$41.00	\$410.00	\$2,870.00	\$12,300.00	\$41.00	\$410.00	\$2,870.00	\$12,300.00
Generator	Generator-125kW	125kW		Unlimited	\$88.00	\$880.00	\$6,160.00	\$26,400.00	\$88.00	\$880.00	\$6,160.00	\$26,400.00
Generator	Generator-250kW	250kW		Unlimited	\$98.00	\$980.00	\$6,860.00	\$29,400.00	\$98.00	\$980.00	\$6,860.00	\$29,400.00
Explosives Truck		N/A		Unlimited	\$43.00	\$430.00	\$3,010.00	\$12,900.00	\$43.00	\$430.00	\$3,010.00	\$12,900.00
Water Truck	Kenworth T300	N/A		Unlimited	\$75.00	\$750.00	\$5,250.00	\$22,500.00	\$75.00	\$750.00	\$5,250.00	\$22,500.00
Welding Truck	International 4700	N/A		Unlimited	\$52.00	\$520.00	\$3,640.00	\$15,600.00	\$52.00	\$520.00	\$3,640.00	\$15,600.00
Mech. Truck	International	N/A		Unlimited	\$68.00	\$680.00	\$4,760.00	\$20,400.00	\$68.00	\$680.00	\$4,760.00	\$20,400.00
Tandem Tandem	International	N/A		Unlimited	\$115.00	\$1,150.00	\$8,050.00	\$34,500.00	\$115.00	\$1,150.00	\$8,050.00	\$34,500.00
Float	Mack GU 713	2012		Unlimited	\$174.00	\$1,740.00	\$12,180.00	\$52,200.00	\$174.00	\$1,740.00	\$12,180.00	\$52,200.00
Highway Truck	Mack			Unlimited	\$82.00	\$820.00	\$5,740.00	\$24,600.00	\$82.00	\$820.00	\$5,740.00	\$24,600.00

*All rates are in CDN\$

Equipment Type	Manufacturer and Model Number	Size	Year	Quantity Available	First Shift				Second Shift			
					Hour	Day	Week	Month	Hour	Day	Week	Month
Fuel Truck	Mack RD688S	2001	2001	2	\$93.00	\$930.00	\$6,510.00	\$27,900.00	\$93.00	\$930.00	\$6,510.00	\$27,900.00
Pickup	Ford F150	1/2 Ton	2011	Unlimited	\$20.00	\$200.00	\$1,400.00	\$6,000.00	\$20.00	\$200.00	\$1,400.00	\$6,000.00
Pass Bus	Freightliner Solaris	2012	2012	4	\$45.00	\$450.00	\$3,150.00	\$13,500.00	\$45.00	\$450.00	\$3,150.00	\$13,500.00
Hydraulic Hammer	Cat H180DS	N/A	2011	Unlimited	\$107.00	\$1,070.00	\$7,490.00	\$32,100.00	\$107.00	\$1,070.00	\$7,490.00	\$32,100.00
Air Compressor	Atlas Copco	185 Cfm	2010	Unlimited	\$40.00	\$400.00	\$2,800.00	\$12,000.00	\$40.00	\$400.00	\$2,800.00	\$12,000.00
Manlift	JLG Manlift	60 feet	N/A	Unlimited	\$63.00	\$630.00	\$4,410.00	\$18,900.00	\$63.00	\$630.00	\$4,410.00	\$18,900.00
Welding Machine	Miller	400 Amp	N/A	Unlimited	\$25.00	\$250.00	\$1,750.00	\$7,500.00	\$25.00	\$250.00	\$1,750.00	\$7,500.00

NOTES

1. The rates include, but are not limited to, the cost of equipment rental, fuel, lubricants, tires, expendable parts, service, maintenance, calibration, repairs, storage, insurance, licenses, depreciation, interest, taxes, overhead, mark-up and profit.
2. The rates include labour and equipment for fuelling, lubricating, servicing, maintaining, repairing, spare parts and installation.
3. The rates exclude operator's labour costs.
4. Rates are applicable only to actual operating time.
5. For any equipment not listed, rental rates will be agreed to in writing by Company prior to the deployment and use of such equipment. Equipment rented or leased from a third party shall be compensated at actual documented invoice cost plus a mark-up of five percent (5%). Third party leasing shall be subject to the Approval of Company in advance of the deployment and use of such equipment. In the event of third party leased equipment requires operation and maintenance, then the appropriate rate for same shall be subject to the Approval of Company in advance of the deployment and use of such equipment.
6. If Approved by Company, the time required to mobilize and demobilize equipment not located at the Site and which is to be deployed at the Site on Change Order Work will be compensated. Compensation will include loading and transportation costs where this is more efficient than travelling the equipment. The cost of demobilizing the equipment will not be compensated if such equipment is used at the Site for Work performed on a lump sum or unit price basis.

EXHIBIT 2 - APPENDIX E

ESTIMATED TRADE PERSON-HOUR SCHEDULE

ESTIMATED TRADE PERSON-HOUR SCHEDULE

Trade (IBEW Grouping)	Trade Classification/Level	Number of LOA Person-Days	Travel KMs	Regular Time Person-Hours	Overtime (1.5x) Person-Hours	Overtime (2.0x) Person-Hours	Second Shift Person-Hours	Third Shift Person-Hours	Travel Time Hours	Total Person-Hours
Ironworkers – Structural (JP Mechanical I)	Non-working Foreperson									
	Working Foreperson									
	Journeyman	10	TBD	70	20	10	0	0	0	100
	Apprentice - 1st year									
	Apprentice - 2nd year									
	Apprentice - 3rd year									
	Apprentice - 4th year									
Plumbers and Pipefitters (JP Mechanical I)	Non-working Foreperson									
	Working Foreperson									
	Journeyman	22	TBD	154	44	22	TBD	TBD	TBD	220
	Apprentice - 1st year									
	Apprentice - 2nd year									
	Apprentice - 3rd year									
	Apprentice - 4th year									
Heavy Duty Equipment Mechanic (Heavy Duty Equipment Technician)	Non-working Foreperson	200	TBD	1400	400	200	TBD	TBD	TBD	2000
	Working Foreperson									
	Journeyman	700	TBD	4900	1400	700	TBD	TBD	TBD	7000
	Apprentice - 1st year									
	Apprentice - 2nd year									
	Apprentice - 3rd year									
	Apprentice - 4th year									
Crane Operator (Crane Operator)	Non-working Foreperson									
	Working Foreperson	52	TBD	361	104	52	TBD	TBD	TBD	516
	Journeyman									
	Apprentice - 1st year									
	Apprentice - 2nd year									
	Apprentice - 3rd year									
	Apprentice - 4th year									

Trade (IBEW Grouping)	Trade Classification/Level	Number of LOA Person-Days	Travel KMs	Regular Time Person-Hours	Overtime (1.5x) Person-Hours	Overtime (2.0x) Person-Hours	Second Shift Person-Hours	Third Shift Person-Hours	Travel Time Hours	Total Person-Hours
Heavy Equipment Operator (Heavy Equipment Operator)	Non-working Foreperson	727	TBD	5085	1453	727	TBD	TBD	TBD	7265
	Working Foreperson									
	Journeyman	5686	TBD	39803	11372	5686	TBD	TBD	TBD	56862
	Apprentice - 1st year									
	Apprentice - 2nd year									
	Apprentice - 3rd year									
	Apprentice - 4th year									
Painters and Allied Trades (JP Civil)	Non-working Foreperson	38	TBD	266	76	38	TBD	TBD	TBD	380
	Working Foreperson									
	Journeyman	156	TBD	1092	312	156	TBD	TBD	TBD	
	Apprentice - 1st year									
	Apprentice - 2nd year									
	Apprentice - 3rd year									
	Apprentice - 4th year									
Utility Person/Labourer	Non-working Foreperson	48	TBD	336	96	48	TBD	TBD	TBD	480
	Working Foreperson									
	Utility Person/Labourer	1756	TBD	12292	3514	1756	TBD	TBD	TBD	17562
Blaster/Driller/ Compressor Operator	Non-working Foreperson	176	TBD	1232	352	176	TBD	TBD	TBD	1760
	Working Foreperson									
	Blaster/Driller/ Compressor Operator	960	TBD	6720	1920	960	TBD	TBD	TBD	9600

Notes

- LOA = Living Out Allowance.

EXHIBIT 2 - APPENDIX F

SWORN DECLARATION

SWORN DECLARATION – ACCOMPANYING INVOICE FOR PAYMENT

CANADA) IN THE MATTER OF THE AGREEMENT
) BETWEEN COMPANY AND
 PROVINCE OF NEWFOUNDLAND) **[CONTRACTOR]** DATED AS OF **[DATE]** FOR
 AND LABRADOR) THE **[DESCRIPTION OF WORK]** BEING
) AGREEMENT NO. **[INSERT NO.]** (the
) “Agreement”)

I, **[●]**, of the City of **[●]**, in the **[Province]/[State]** of **[●]**,**[Country]**, do solemnly declare that:

1. I am the **[title]** of **[full legal name of Contractor]** and as such have personal knowledge of the facts set out in this Declaration.
2. Defined terms used in this sworn Declaration but not defined in this Declaration have the meanings given to those terms in the Agreement.
3. All (a) payments due to Subcontractors, (b) wages and benefit payments due to any of the Contractor’s Personnel, and (c) Taxes, contributions, premiums, allowances and remittances due to any Authority, pension fund, benefit plan or union fund in accordance with a collective agreement or Applicable Laws, have been paid in a timely manner on or before the date of the Invoice and associated Payment Certificate to which this Declaration relates, subject to any withholdings or holdbacks required by Applicable Laws.
4. Title to the applicable part of the Work will pass to Company in accordance with Article 23 of the Agreement.
5. (a) There are no known outstanding Claims under the Agreement, except for those Claims which have already been communicated to Company in a timely manner in the form of Notice required by the Agreement and which are described and listed in the Appendix to this Declaration, including an estimate of the value of each such Claim;
 or
 (b) There are outstanding Claims which have not been communicated to Company and each of these Claims is described and listed in the Appendix to this Declaration and is delivered to Company in a timely manner, and there are no other known outstanding Claims under the Agreement, except for those Claims which have already been communicated to Company in a timely manner in the form of Notice required by the Agreement and which are described and listed in the Appendix to this Declaration, including an estimate of the value of each such Claim.

6. The last application for payment for which we have received payment is No. _____ dated the _____ day of _____, 20__.

I make this Declaration conscientiously believing it to be true and knowing it is of the same force as if made under oath.

DECLARED before me at the City of _____)
[•], _____)
in the [Province]/[State] of _____)
[•], _____)
[Country] _____)
on [Month], [Date], 20[•] _____)
_____)

Name:
A Commissioner, etc.

Declarant

APPENDIX TO SWORN DECLARATION
[Date]

(a) Claims previously communicated to Company:

Description

Estimated Value

(b) Claims not previously communicated to Company:

Description:

Estimated Value:

(15246579.1)

EXHIBIT 3

COORDINATION PROCEDURES

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- Appendix G– Engineering Change Notice (ECN)
- Appendix H – Field Work Order (FWO)

1 INTRODUCTION

This Exhibit 3 – Coordination Procedures is intended to govern Contractor, Engineer and Company in the administration and management of the Agreement.

Contractor shall use its own systems, methods and procedures in the administration of the Work. However, Company has certain requirements regarding Agreement administration, monitoring and coordination, consistency and project controls with which Contractor shall comply. These requirements are described in this Exhibit 3. Where necessary, Contractor shall adapt its own systems, methods and procedures to satisfy such Company requirements.

It is Company's intention that Company and Contractor work together to mutually agree on a set of methods and procedures for performing the Work. In this regard, Company will require a series of meetings in Company offices immediately following Effective Date. During the meetings, Contractor, Company and Engineer will review Contractor's proposed methods and procedures for executing the Work. Following this review, the Parties will agree on any modifications to Contractor's methods and procedures required to satisfy the requirements of this Exhibit 3.

The following additional Exhibits have been provided to specify Company requirements and Contractor responsibilities with respect to Health and Safety Requirements (Exhibit 5), Environmental and Regulatory Compliance Requirements (Exhibit 6), Quality Requirements (Exhibit 7) and Provincial Benefits (Exhibit 13).

2 EARLY ACTIVITIES AND GENERAL EXECUTION

2.1 SCOPE

This Section 2 sets forth minimum early activities associated with preparation for execution as well as general execution activities.

2.2 OBJECTIVES

Contractor shall employ a systematic management approach to the Work embracing sound management principles, including:

- a) Finalization of an Execution Plan as it pertains to the Work (as described in Section 2.4 below); and
- b) Understanding of and alignment with Company's objectives, priorities, and philosophies with the aim of Contractor developing appropriate plans and procedures.

2.3 CONTRACTOR DUTIES

Contractor shall:

- a) Review Contractor's proposed Execution Plan with Company. Update the plan with all Accepted changes and enhancements and maintain on an ongoing basis;

- b) Participate in meetings, as scheduled by Engineer, to mutually agree on methods and procedures for performing the Work. Meetings shall be held in Company offices and may be scheduled to begin within fourteen (14) days of the Effective Date and shall be completed within forty-five (45) days of the Effective Date;
- c) Provide all information requested by Company to support Company's appraisal of Contractor's performance of the Work, including performance of other members of the Contractor Group. Such information may include, without limitation, Contractor Group systems, methods and procedures for performing the Work; copies of calculations, working drawings, specifications, purchase requisitions and recommendations (if applicable); estimates; labor productivity data; schedules; procedures; and alternative studies;
- d) Contractor shall maintain close management alignment with Company and Engineer during execution of the Work;
- e) Actively support and participate in project reviews as required by Company and as they relate to the Work.

2.4 SPECIFIC REQUIREMENTS

Early Deliverables

A list of all early deliverables and the timing of their submission to Company is specified in Exhibit 4 - Supplier Document Requirements List.

Execution Plan

The Execution Plan forms an integral part of the Agreement. Contractor shall make all changes based on Engineer's comments and submit a final Execution Plan to Engineer for Acceptance by the date specified in Exhibit 4 – Supplier Document Requirements List. The Execution Plan will serve as the basis for developing the detailed plans for the Work.

Contractor shall maintain the Execution Plan as a living, working document. Changes to such plan will be subject to the review and Approval of Company. As changes arise, Contractor shall identify and document critical issues and/or potential constraints that could adversely affect the accomplishment of Company's objectives for the Work and shall submit such changes to Company for Approval.

The Execution Plan shall:

- a) Document the results of the overall planning process for the Work. The Execution Plan is a framework from which will evolve execution strategies and approaches, work plans, risk identification and mitigation plans, detailed procedures, organizational structures, logic networks, schedules and other material needed by Contractor's Personnel to develop execution details and Contractor's plans for the Work, including detailed fabrication and construction plans;
- b) Document Contractor's objectives, priorities and philosophies that are based on and consistent with Company's objectives, priorities and philosophy for the Work; and
- c) Outline formalized processes to be employed to identify broad strategic issues, evaluate

impact, develop mitigation measures/action plans, and to follow-up on results of mitigation measures/action plans.

Coordination Teams

As one of the early project activities, coordination teams will be established at various levels within Contractor's and Company's organizations. Contractor and Company will mutually agree on the composition of each team and agree on the frequency of meetings. If there is a failure to agree on such composition and/or frequency, Engineer shall have the authority to determine these matters.

The initial meetings of the coordination teams will be to:

- a) Develop positive working relationships between team members;
- b) Develop plans to meet objectives, guidelines for individual and team behaviours, and teamwork, and determine Contractor / Company success criteria;
- c) Identify and review, as appropriate by team, challenging areas or areas of opportunity which require special attention; and
- d) Establish the initial framework for the specific plans for the Work as referenced in this Exhibit 3.

3 ORGANIZATION, ADMINISTRATION AND REPORTING

3.1 CONTRACTOR DUTIES

Contractor shall:

- a) Submit proposed, and Accepted or Company Approved organization charts, identifying key positions required for executing the Work. These shall be included within the Execution Plan;
- b) Provide information required by Company and seek Company's Approval on matters as required by the Agreement;
- c) Participate in regular meetings with Company, Engineer and Company's Other Contractors to discuss the status of the Work, methods for resolving problems encountered or anticipated, and other topics pertinent to the Work; and
- d) Provide to Company Group Personnel offices, logistical support and facilities at Contractor's offices and the Worksite(s), as required by Company and Engineer (to be specified in Section 3.2.6 below, if required).

3.2 SPECIFIC REQUIREMENTS

3.2.1 CONTRACTOR ORGANIZATION

Within the time specified in Exhibit 4 - Supplier Document Requirements List, and to be included in the Execution Plan, Contractor shall submit a description of its project organization for the Work indicating clear lines of decision making, authority and responsibility addressing as a minimum the following:

- a) Project management organization;
- b) Safety management organization both at home office and for the Worksite(s);
- c) Quality management organization, including Quality Manager, Worksite(s) quality organizations and vendor inspection organization;
- d) Regulatory and environment organization(s);
- e) Procurement organization, including purchasing, subcontracting and material management for both Contractor’s home office and for the Worksite(s);
- f) Project controls including cost and schedule management for both Contractor’s home office and for the Worksite(s);
- g) Technical organization, including engineering, design, constructability and document control;
- h) Construction Worksite(s) including engineering support, planning, cost and schedule control, material management, quality, safety and construction operations (including field supervision);
- i) Completions organization (if applicable); and
- j) Start-up organization (if applicable).

Each organization within the overall organization of the Work shall have key Personnel assigned and have designated authority and responsibility for the given portion of Work.

For each position designated as being key Personnel, the following information shall be provided:

- a) Roles and responsibilities;
- b) Job titles;
- c) Approval authority assigned to each position;
- d) Contact address(es) and telephone number(s); and
- e) Candidate's most recent resume.

Contractor shall update the organization charts, contact addresses and phone numbers as changes occur to the Work, as Contractor's overall organization changes or as requested by Engineer.

The organization charts shall clearly indicate how and to whom Contractor's organization for the Work reports in its home and/or any affiliated offices and the relationship of Contractor's organization for the Work to its corporate and/or departmental organization.

Listed below are Contractor’s key Personnel for the management, control and execution of the Work. Contractor shall maintain up-to-date organization charts, which shall be submitted to Engineer in the event of changes.

POSITION DESCRIPTION (TITLE)	NAME
Project Sponsor	Leonard Knox
Project Manager	Darryl Gillingham
Contracts Administrator & Benefits Coordinator	Willie Keats
Construction Manager	Brian Nichols

Key Personnel shall be assigned on a full time basis and be committed to continue throughout the Term in order to maintain continuity. The appointment, transfer and replacement of key Personnel shall be subject to Engineer's prior Acceptance.

3.2.2 CORRESPONDENCE AND COMMUNICATION REQUIREMENTS

Correspondence and Notices

Company and Contractor shall jointly establish a correspondence plan and procedures which shall be periodically updated and kept current.

Aconex shall be utilized to manage all written communication between Company/Engineer and Contractor. Aconex is an electronic document management system which is a secure on-line platform for storing, managing and distributing project information that can be accessed via an internet connection and a web browser (www.aconex.com). The implementation of Aconex Mail will be coordinated during the kick-off meeting between Contractor and Engineer.

The Aconex module, "LCP Rev Controlled", will be utilized for all technical documentation (refer to the document entitled "LCP Supplier Document Requirements" provided in Exhibit 11 - Company Supplied Documents).

The Articles of this Agreement contain instructions regarding Notices. Contractor shall not receive nor accept instructions concerning the Work from anyone other than the Company Representative or his/her designee. Contractor shall not use meetings, oral discussions, etc. as a forum to submit Change Requests. Change Requests will be addressed using appropriate procedures set out in this Exhibit 3.

Company and Contractor Representatives

All formal correspondence, documents and Agreement deliverables required by the Agreement, including this Exhibit 3, from Contractor to Company shall be addressed to the Company Representative. Likewise all correspondence from Company to Contractor shall be sent to Contractor's Representative.

Company Representative

The Company Representative has the responsibility of managing the Agreement on behalf of Company, including Approval of Changes, amendments to the Agreement and issuance and receiving of Notices.

The Company Representative has the authority to stop the Work for the purposes of safety, quality and risk of damaging Company property under the care, custody and control of Contractor. Notification of stoppage can be addressed verbally, and then supported by writing. Contractor shall resume Work when appropriate actions are addressed to the satisfaction of

Company. No compensation will be provided for Work stoppages of this nature.

The Company Representative may delegate any of his or her responsibilities to any nominated deputy. Notice of delegation shall be provided to Contractor's Representative and Engineer in writing.

Engineer

Engineer's role and responsibilities are detailed in Article 11 of this Agreement. Company may delegate any of Engineer's responsibilities to any nominated deputy. Notice of delegation shall be provided to Contractor's Representative in writing.

Contractor's Representative

Contractor shall appoint a Contractor's Representative for the Work, who shall have full authority to receive instructions and administer the Agreement for and on behalf of Contractor, in addition to those authorities stated in the Articles of this Agreement.

The Contractor's Representative shall have the responsibility for receiving, acknowledging, countersigning and returning any instructions, decisions, Notices, authorizations and acknowledgements to Contractor under this Agreement, in addition to those responsibilities stated in the Articles of this Agreement. Contractor's Representative shall also be responsible for administering, monitoring, reviewing and coordinating all aspects of the Work on behalf of Contractor.

Contractor's Representative may delegate any of his or her responsibilities to any nominated deputy upon prior Notice to the Company Representative and Engineer. Notifications, information, authorizations, acknowledgements and decisions from any such nominated deputy shall be as if from Contractor's Representative.

Date Format

The accepted date format for LCP is dd-mm-yyyy (i.e., 20-Oct-2013).

3.2.3 REPORTS AND MEETINGS

Contractor shall submit reports to Company on the progress of engineering, procurement, and construction and on the status of other activities for the Work as otherwise provided below and other provisions in this Exhibit 3.

Weekly Report

Contractor shall submit a weekly report ("Weekly Report"), which shall reflect the current status of the Work, progress and issues. The timing, format and content shall be as agreed between Contractor and Engineer, but shall address the following as a minimum:

- Brief summary of status of the Work;
- Management and administration;
- Significant items planned for the following weeks;
- Health, safety and environment;
- Quality management;
- Highlights and concerns including any required and implemented corrective action in all of the following main areas:
 - engineering
 - procurement
 - manufacturing
 - fabrication
 - construction
 - installation
 - completions;
- Interface activities;
- Status of Change Requests; and
- Receipt of major components and/or materials at the Site.

Monthly Progress Report

Contractor shall submit a monthly progress report (“Monthly Progress Report”) based on a cut-off date to be defined by the Engineer. The timing of the submission of this report shall be by close of business no later than the 5th calendar day of the following month. The first Monthly Progress Report shall be issued not later than forty-five (45) calendar days after the Effective Date. The format and content of the Monthly Progress Report shall be as agreed between Contractor and Engineer, but shall address the following as a minimum:

- a) Highlights in bullet point style of the significant accomplishments achieved and issues addressed during the reporting period;
- b) A description of problems or delays encountered or anticipated, and corrective actions initiated or contemplated to counteract or minimize the effect of such problem, together with the results of any corrective actions already taken;
- c) The Worksites’ safety status including health and safety statistics for the past month and for the Work to date. The content and format for the safety statistics are provided in Exhibit 5 – Health and Safety Requirements. Major safety problems shall be highlighted and action plans to improve conditions outlined. Safety initiatives undertaken during the past month and/or planned for the forthcoming month shall be discussed;
- d) Short narrative covering all significant events during the reporting period;
- e) Management, including mobilization, systems implementation, procedures development and other administrative activities;
- f) Current status of the Work. Progress data (progress curves, histograms, productivity information and Summary Schedules) shall be provided on graphs which show actual versus planned progress as further described in Section 9 of this Exhibit 3 for: (i) engineering, (ii) equipment and materials orders, (iii) equipment and materials deliveries at

the Worksite(s), (iv) construction, (v) completions and (vi) overall Work progress. For activities that are behind schedule, an analysis of reasons for the slippage shall be included, together with a description of actions to be taken to recover;

- g) All constructability issues;
- h) The quality status including quality statistics for the past month and for the Work to date;
- i) Interface management status;
- j) Cost and financial reports as defined and/or specified in Sections 6 and 13 of this Exhibit 3;
- k) The status of planning, scheduling and schedule control, including coverage of relevant activities called for within Section 7 of this Exhibit 3;
- l) The status of Changes, if any, and the corresponding current value of the Contract Price including the effect of Change Orders and Change Requests;
- m) The status of procurement and subcontracting, including placement of Subcontracts (including Subcontractors' subcontracts of every tier), status of spare parts orders, performance of Subcontractors (including Subcontractors' subcontracts of every tier), and Subcontract administration matters (including Subcontractors' subcontracts of every tier);
- n) The status of items involving Authorities such as inspections, approvals, permits, clearances and licenses, as further described in Exhibit 6 - Environmental and Regulatory Compliance Requirements;
- o) Provincial Benefits report as described in Exhibit 13; and
- p) Monthly risk report consisting of the following:
 - A structured narrative that describes major risk activities and events during the reporting period containing major changes in the Risk Register (as defined in Section 9.1(c) below) with a focus on medium and high level risks;
 - Highlights of five (5) to seven (7) most important package risk management activities and events; and
 - An updated Risk Register (as defined in Section 9.1(c) below).

Final Contract Report

A final report summarizing the Work shall be submitted by Contractor to Engineer for Acceptance, the content and timing of which shall be specified by Engineer. Such an Accepted final report shall be submitted to Engineer by Contractor prior to Contractor's request by Notice of a Final Completion Certificate.

Meetings

Meetings of key Contractor's Personnel, and Engineer and Company Personnel, shall be held regularly.

Monthly and weekly progress meetings will be held, details of format and content of which will be as agreed between Contractor and Engineer. If there is a failure to agree on such format and/or content, Engineer shall have the authority to determine these matters.

Engineer may hold other meetings with Contractor to discuss matters of technical, interface management, health, safety, environmental, design, quality, verification, certification, documentation, engineering data, cost, accounting, scheduling, construction, progress and the like, and as may be otherwise required for the Work and the Agreement. Contractor shall ensure sufficient and appropriate qualified Personnel are available to attend.

In general, meetings shall adhere to the following guidelines:

- a) The agenda items for any meeting will be issued by Engineer to the Parties no less than two Business Days prior to such meeting. Both Engineer and Contractor shall ensure, in accordance with their respective responsibilities that reports, reproducible documentation and forward planning information relating to agenda items are issued in sufficient time to allow adequate preparatory study and evaluation;
- b) The meeting will address only the items covered by the agenda and any other minor topics relevant to the Parties and subject concerned; and
- c) In those instances where matters of urgency need to be addressed, Company and Contractor will make every effort to address such items at the earliest opportunity;
- d) It shall be the responsibility of Engineer to record minutes of all meetings unless otherwise instructed by Engineer. Minutes should be brief, indicate with whom the responsibility for action lies, the date the action was assigned and the date required for completion of such action. Minutes should also state the results of assigned actions outlined in previous minutes, including the actual date of completion of the action.

Photographs

Contractor shall provide photographs as Company may request of sufficient quality for possible inclusion in Company's publications depicting significant activities and general progress of the Work.

3.2.4 INFORMATION SYSTEMS AND TECHNOLOGY (IS/IT)

Contractor shall:

- a) establish and maintain an IS/IT infrastructure and associated computing environment to ensure overall reliability, performance and security control;
- b) provide access, for Engineer and Company Personnel, to any software applications and supporting services required in order for Engineer and Company to perform their work;
- c) maintain an upgrade path for electronic formats that will keep data formats compatible with that of Engineer;
- d) securely transfer data and information electronically to Engineer on a timely basis using industry recognized standards, processes, systems and methodologies;
- e) ensure control practices and risk mitigation plans are in place to provide protection and safeguard for all data and information related to the Work including but not limited to access management, data corruption, data loss, backup and disaster recovery procedures; and
- f) within thirty (30) days of the Effective Date, provide to Engineer a description of the IS/IT support organization and how it is structured to support the Work.

3.2.5 DATA

All documentation and information, including correspondence, notes reports, information identified and/or required by this Agreement, drawings, specifications, schedules, weekly, bi-weekly and/or monthly reports, databases, records, videos, photos and other documents (hereinafter collectively referred to as "Data") shall be made available to Engineer and Company in electronic native format as well as hard copy. The transfer of Data will be by storage medium such as optical or magnetic discs, or other form specified from time to time by Engineer. Contractor shall undertake all reasonable efforts to ensure Data is provided in a form fully useable to Engineer and Company with well recognized industry standard applications.

Where the software necessary to enable Engineer and Company to fully utilize Data is based in whole or in part on Contractor's proprietary information/software, Contractor shall grant Company Group a non-exclusive, perpetual, royalty free, irrevocable and non-transferable (except to a permitted assignee of this Agreement) license to such information/software.

Where the software is not proprietary to Contractor and obtained through usage of software leased or purchased from third parties, Contractor shall, subject to Company Approval, arrange for and obtain for the benefit of Company Group a non-exclusive, perpetual, royalty free, irrevocable and non-transferable (except to a permitted assignee of this Agreement) license to use such software to enable Engineer and Company to fully utilize Data.

Throughout the Term, Company in conjunction with Engineer shall review Data to ascertain what data is to be passed to Company by Contractor for future use.

4 INTERFACE MANAGEMENT

Contractor shall manage external interfaces with other organizations involved in the LCP, including Engineer, Company's Other Contractors and their subcontractor(s) and vendor(s) of every tier, Authorities and other entities associated with the Work.

4.1 OBJECTIVES

Contractor shall:

- a) Have primary responsibility for managing technical and execution interfaces and thus coordinating its activities with other organizations as required to effectively accomplish the Work;
- b) Identify major interfaces early in the Work through a structured process;
- c) Define the interface information needed for the Work. Contractor and other interfacing entities (including originating and responding organizations) shall then agree on roles, responsibilities and timing for providing agreed upon information or actions;
- d) Ensure that all communications with other organizations shall be clear, accurate, timely and consistent to accomplish their intended purpose of transferring information between organizations or ensuring agreed action is taken to progress the Work;

- e) Ensure that interface resolution issues with potential for impacts to cost or schedule shall be identified quickly and communicated to all interfacing entities, including Engineer, in order to minimize their impact; and
- f) Cooperate with Engineer and comply with the requirements of Engineer's interface management system as it relates to the Work.

4.2 SPECIFIC REQUIREMENTS

Contractor shall:

- a) Develop an interface management plan and shall implement systems and methodology for ensuring the identification of originators and responders, quality, accuracy and timeliness of interface information;
- b) Incorporate the schedules for submittal of its deliverables (as determined by interface management activities) as milestones in Contractor's schedule for the Work. Contractor shall manage compliance with such milestones accordingly;
- c) Schedule and participate in interface coordination meetings with Engineer, Company, Company's Other Contractor(s), and their subcontractor(s) and vendor(s) of every tier, and other organizations, as required to properly manage interfaces; and
- d) Regularly advise Engineer on the status of resolution of interface issues. Contractor shall promptly elevate unresolved interfaces and interface issues to Engineer/Company for resolution.

5 MATERIAL CONTROL

General

Contractor shall maintain records of materials procured for the Work. Engineer will have the right to carry out periodic inspection of all Contractor Group's storage and inventory control records for the Work as well as physical spot checks of all material held in storage.

Company Supplied Items

Contractor shall:

- a) Receive from Company all Company supplied items and as applicable unload, unpack, inspect, and confirm receipt and condition of receipt by issuing a material receiving report to Engineer confirming Contractor acceptance of items and the condition of items at the time of acceptance;
- b) Ensure that all materials are used correctly and no materials are substituted without prior Engineer Acceptance;
- c) Be responsible for the security and safe keeping of all Company supplied items and ensure all items are visually marked as being provided for the Work;
- d) Maintain index records and account for all Company supplied items received and installed, and the remaining surplus and scrap. The index shall, at a minimum, include description, part number, serial number, storage location, status and receipt date;
- e) Secure, protect and maintain all Company supplied items in accordance with specifications

and preservation requirements in accordance with industry practice and standards and as set forth in this Agreement; and

- f) Be responsible for any costs incurred as a result of Contractor's failure to properly store, preserve and protect Company supplied items.

Company shall:

- a) Supply Company supplied items to Contractor complete with available documentation to demonstrate traceability and quality assurance to Contractor; and
- b) Have the right to inspect Company supplied items at Contractor Group's storage location(s) and storage records at any time without prior Notice. Such inspection shall not relieve the Contractor of any responsibility for the accountability and safe keeping of Company supplied items.

Inspection

Contractor shall be responsible for and undertake inspection of Contractor Group's supplied equipment and materials for the Work. Contractor shall issue to Engineer inspection reports accompanied by all relevant inspection documents.

Shipping

Contractor shall be responsible for shipment of all materials, components and equipment to the Worksite(s), including those shipments made by all members of Contractor Group. Contractor must satisfy itself that shipping arrangements by such members are satisfactory, or alternatively organize critical shipments itself or through the use of an appointed shipping or forwarding agent.

Contractor shall establish and issue to all members of Contractor Group proper packaging, shipping and marking instructions including necessary addresses, proforma invoices, bills of lading, customs releases and the like, depending on the various methods of transport, border crossings and receiving location(s).

Contractor shall be responsible for all necessary loading and off loading at all locations.

A logistics and transportation plan shall be produced by Contractor and submitted to Company by the date specified in Exhibit 4 – Supplier Document Requirements List for Company review and Approval.

6 COST MANAGEMENT

Cost Control of Accounts

Engineer will provide cost control accounts to Contractor within thirty (30) days of the Effective Date. The cost control accounts will be cross referenced to the compensation amounts outlined in Exhibit 2 – Compensation.

Cost Report

Contractor will submit to Company, by the 20th day of each and every calendar month, an incurred cost flow report specifying:

- a) the costs actually incurred by the Contractor from the Effective Date up to the 25th day of such month (accordingly, the final five day period of such month shall be estimated); and
- b) the estimated cost flow to be incurred by Contractor from the 25th day of such month to the remainder of the Term.

Such report shall be consistent with the control accounts and payment elements contained in Exhibit 2 – Compensation.

Cost Management Plan

Where the Work includes significant elements of reimbursable activities, Contractor shall prepare and submit to Company, within thirty (30) days of the Effective Date, a cost management plan for Company review and Approval.

7 SCHEDULE MANAGEMENT

This Section 7 sets forth the minimum requirements for Contractor's planning, scheduling, measurement and reporting of physical progress, and schedule control activities for the Work.

7.1 DEFINITIONS

- a. **Earned Value Management**: A method to measure the value of Work performed. Earned value uses current budgets and progress-to-date to show whether the incurred values are on budget and/or whether the tasks are ahead or behind the Accepted Control Schedule Baseline Document. A method for measuring Work productivity and performance; it compares the effort of Work that was actually expended with what was physically completed.
- b. **Control Schedule (CS)**: Also referred to as the Construction Schedule in Article 1 of the Agreement, the Control Schedule forms the basis to measure progress in which cost, schedule, scope and other performance criteria are formally compared against the Accepted Control Schedule Baseline Document for assessment of progress and performance. The Control Schedule forms the benchmark for comparison and identification of cost and schedule deviations. The Control Schedule shall represent the total Work execution and interfaces with others (Milestones, key dates, design, procurement, regulatory, fabrication and manufacturing, transportation, installation, construction and completion) covering the entire duration of the Work, and includes roll-up details of all Contractor's schedules. The Control Schedule is to be a schedule network, which is calculated using the critical path method. Contractor will ensure that the Control Schedule aligns with Exhibit 9 - Schedule. The Control Schedule shall be developed using Primavera

(P6 or later version) or equivalent. If software other than Primavera is used, the native file shall have the capability to be easily converted to Primavera P6 and shall be subject to the Acceptance of Engineer.

- c. **Milestone**: The start or completion of an activity in the performance of the Work and which is identified as such in Exhibit 9 – Schedule.
- d. **Control Schedule Baseline Document (CSBD)**: A series of schedules, s-curves, histograms, tables and narrative which together form the basis of the plan to complete the Work. The Control Schedule Baseline Document is updated and re-issued following re-baselining of the Control Schedule. The CSBD includes the Control Schedule, as well as critical and near-critical path(s). The Control Schedule Baseline Document shall provide supporting documentation to the Control Schedule. It shall include all baseline assumptions regarding schedule durations, logic, installation rates, progress weighting and relevant material as deemed necessary by Engineer.
- e. **Summary Schedule (SS)**: The Summary Schedule incorporates all Milestones and is a roll-up of schedule information from the detailed Control Schedule such as engineering, procurement, construction, fabrication, installation and completions and any subject deemed necessary by the Engineer to adequately convey a rollup or the CS.
- f. **Schedule Development and Control Plan (SDCP)**: A formal document providing the approach to planning and schedule control including schedule development, analysis, forecasting, reporting, corrective action and the method for incorporation of Changes. The SDCP addresses the scheduling interfaces between Contractor and other members of the Contractor Group, as well as Contractor and Engineer. In particular, the plan shall provide a detailed description of Contractor's progress measurement system including how Contractor measures, verifies and reports physical progress of each major activity of the Work (such as engineering, procurement, fabrication, manufacturing, permitting, transportation, construction/installation and completion).
- g. **Monthly Cut-Off Date**: The month end date that Contractor uses as a basis to compile its progress during the month. The Monthly Cut-off Date will be agreed between Contractor and Engineer based on the nature of the Work. If there is a failure to agree on such date, Engineer shall have the authority to determine the date.
- h. **Monthly Risk Statement**: Indicates the major risks identified during the month that could represent a threat to the success of the Work, the contemplated mitigation measures for newly identified risks and the actions status pertaining to mitigation measures proposed for previously identified risks.
- i. **Monthly Progress Report**: The monthly report which is described in Section 3.2.3 of this Exhibit 3.
- j. **Weekly Report**: The weekly report which is described in Section 3.2.3 of this Exhibit 3.

7.2 CONTRACTOR DUTIES

With respect to planning, scheduling and schedule control of the Work, Contractor will:

- a) Prepare, implement and maintain a Schedule Development and Control Plan (SDCP) in accordance with the date specified in Exhibit 4 – Supplier document Requirements List for the Work using methods and procedures that are in accordance with industry recommended practice (i.e., Association for Advancement of Cost Engineering);
- b) Impose the same Control Schedule and progress measurement requirements in the Agreement on other members of Contractor Group;
- c) Analyze and calculate earned quantities, man-hours and costs, and forecast and report the progress of the Work using industry recognized Earned Value Management practices as compared to current Work plans and overall schedule, summarizing the results of the schedule analysis in the Monthly Progress Report, which shall include a Milestone listing with target dates and current forecast dates;
- d) Develop recovery plans and associated schedules if slippage is apparent, or as required by Engineer. Recovery plans will be reviewed with Engineer and implemented upon Engineer's Acceptance. Recovery plans will be monitored and adjustments made as needed to keep the Work on schedule;
- e) Incorporate the results of progress measurement and related status information into schedule forecasts, Weekly Reports and Monthly Progress Reports, as required under this Agreement;
- f) Provide access to all details of schedule preparation, progress measurement and schedule updates when requested by Engineer;
- g) Make changes in the schedule preparation, progress measurement and schedule control procedures at Engineer's request;
- h) Utilize Engineer's progress measurement definition strategy. Actual progress shall be based on physical Work completed measured against the current Work;
- i) Provide Engineer with the Control Schedule (CS) with the baseline estimate that will hold the mechanism of measuring progress in hard copy and electronic form, in accordance with the date specified in Exhibit 4 – Supplier document Requirements List. The native electronic file shall include all information necessary to duplicate Contractor's schedule, progress measurement analysis and resource requirements. In addition to the electronic file, the schedule software settings, calendar definitions and application generated scheduling report shall be included;
- j) Take the initiative to propose potential corrective actions whenever there is an identified trend which indicates that a Milestone will not be achieved or indicates an opportunity to shorten the overall schedule, or counteract potential schedule slippages; and implement the action(s) as Accepted by the Engineer; and
- k) Provide a Control Schedule Baseline Document (CSBD) in accordance with the date specified in Exhibit 4 – Supplier document Requirements List, with all supporting documentation of each schedule update to be validated with s-curves and reporting at levels such as engineering, procurement, manufacturing and installation, as Accepted by Engineer;

7.3 SCHEDULE DEVELOPMENT AND CONTROL PLAN (SDCP)

Contractor's Schedule Development and Control Plan shall cover all areas of schedule development and control, including development, analysis, forecasting, reporting and corrective action. In particular, the plan shall provide a detailed description of Contractor's progress measurement system.

Contractor's Schedule Development and Control Plan will, at a minimum, include:

- a) How Contractor's detailed schedule and current Work plans will be developed, reviewed and updated;
- b) Methodology that Contractor will use to analyze and forecast the progress of the Work relative to current schedules;
- c) How interface management will be addressed. Interface management includes all key internal interfaces within the Work as well as all key interfaces between the Contractor, other members of Contractor Group and Company's Other Contractors. The plan will define how interfaces are identified, stewarded and their status reported;
- d) How interfaces, outside of Contractor's control, could impact the Control Schedule;
- e) The number, types, uses, frequency of updates (and responsibility for updates) and level of detail for each of the various schedules the Contractor intends to use to control the Work;
- f) Methods for analyzing critical path and conducting float analysis;
- g) Procedure for re-baselining the Control Schedule (subject to Engineer's Acceptance);
- h) Coding system for schedules;
- i) The methods that will be used to measure physical progress of each of the various activities or groups of activities in engineering, procurement logistics, fabrication, manufacturing, construction, completions and installation. Methods for engineering shall specifically address use of computer aided design and drafting (CADD), both 2D and 3D;
- j) Procedures within Contractor's organization for review and verification of progress measurement information prepared at each Worksite;
- k) The methods to control over progressing of activities; and verification methods confirming that all activities reported as 100% complete are actually complete;
- l) The method for recognizing the impact of rework on apparent progress, during engineering, procurement, fabrication and construction and the method for specifically progressing and tracking the Work;
- m) The methods and procedures for incorporating the effects of Changes on the assessment of progress;
- n) The method for weighting and combining individual and overall progress measurements to arrive at the discipline and overall progress assessments for engineering, procurement, fabrication, installation, completions and other major activities related to the Work. Progress weightings shall be subject to Engineer's review and Acceptance, and once Accepted shall not be changed without Engineer's prior Acceptance; and
- o) Contractor plans to manage and report receipt of materials and/or components at the Worksites.

7.4 CONTROL SCHEDULE BASELINE DOCUMENT (CSBD)

Contractor shall prepare and submit to Engineer for its review and Acceptance the Control Schedule Baseline Document in hard copy, portable document format (PDF) and native electronic format. All information required to reproduce the Control Schedule Baseline Document including scheduling software settings, working calendars, application time conversion factors, and precedence and scheduling output reports from the scheduling software, will be included with the submission.

The Control Schedule Baseline Document shall be organized into an overall summary section and a detailed section for each component of the Work (such as engineering, procurement, manufacturing, fabrication, testing and handover). Each section shall be organized as follows:

- a) Assumptions underpinning the execution methodology and Control Schedule, as well as any issues that may impact the Work. This section will also include the basis for any planned changes to the Control Schedule;
- b) Summary Schedule;
- c) Progress curve and table;
- d) Critical and sub-critical path(s); and
- e) Detail schedule.

7.5 CONTROL SCHEDULE (CS)

A detailed Control Schedule for the Work will be prepared by the Contractor and submitted to Engineer for its review and Acceptance. Contractor shall develop the Control schedule in accordance with Company's work breakdown structure and code of accounts for the Work. The Control Schedule for the Work shall be aligned with the detailed estimate for the Work. The detailed schedule will contain sufficient detail to demonstrate how all activities affect the cost, Work and Exhibit 9 - Schedule.

The Control Schedule will show activities that provide sufficient detail in all areas of Work execution (such as Milestones, key dates, design, procurement, fabrication, manufacturing, transportation, installation, construction, completions and all relevant interfaces) to enable monitoring and control of the Work. Schedule forecasts will give a complete and accurate representation of the current status of the Work, including Change Orders and Change Requests, and the consequences of overrun and under run person hours, productivity and durations.

The Control Schedule shall be prepared and maintained based on input and requirements from Contractor's user groups such as project management, planning and controls, engineering, procurement, work package preparation, fabrication, transportation and logistics, construction, completions, Subcontractors (including Subcontractors' subcontractors of every tier), Engineer and Company's Other Contractors.

7.6 GENERAL SCHEDULING AND PROGRESS REQUIREMENTS

Contractor's planning, scheduling and schedule control activities for the Work will, at a minimum, include the following:

- a) A time-scaled critical path method (CPM) logic network that shall set forth the order and estimated times by which planned activities are to be completed. This network shall identify the critical and subcritical paths (a subcritical path is defined as any series of activities whose completion is within one (1) week of the critical path completion). The logic network shall clearly indicate all restraints and interrelationships and shall incorporate Exhibit 9 - Schedule;
- b) A description of those activities associated with material sources, other members of Contractor Group and fabrication. All interfaces will be incorporated into the Control Schedule;
- c) All schedule and progress information (CS, SS, tables, histograms, s-curves, document register, procurement plan, manufacturing schedule and support documentation) shall be issued on a monthly basis;
- d) Progress measurements such that the physical progress of the Work can be related easily to the Control Schedule activities. Progress shall be evaluated on discrete, identifiable deliverables for each Work activity weighted by budgeted person hours or other methods to determine a total percent for each activity. Physical progress measurement relates to the assessment of the proportion of actual Work accomplished towards completion of given components of the Work;
- e) The ability to assess progress for all progress earning activities required for each component of Work, regardless of source. As additional progress earning components are identified, they will be added to the base level of Work through the change management process, to be accomplished and progress measured and reported;
- f) Indicate the schedule calendars used to develop the schedule including, daily work hours, work week, shift schedule, scheduled facility shutdowns (if any) and holidays. Any planned non-work periods shall be clearly indicated and a narrative shall be supplied indicating the period of non-work and the rationale for the non-work period;
- g) Show status of all interfaces within the components of the Work (such as engineering, procurement, manufacturing, fabrication, construction and completions);
- h) Exclude home office and field support functions, such as project management, coordination, engineering office follow-up during construction, construction and fabrication management and supervision, warehousing, material handling and clean-up, from physical progress measurements;
- i) Produce and maintain a schedule network that is logically linked, with a minimal number of constraints utilized. Where constraints are required, the fewest possible constraints necessary to meet the required objective will be used. The reason for the constraint shall be noted in the notebook file for that activity. Constraints that affect the backward pass calculation of the network ("Mandatory Finish", "Mandatory Start", "Finish On Or Before", "Start On Or Before", "Finish On", "Start On") are to be strictly avoided, unless Accepted by Engineer;
- j) Use of activity lags is discouraged. Where the use of lags is considered, Contractor shall consider if the use of an activity to represent the lag is a reasonable representation of the condition being modeled. If a lag is used, the reason and rationale for the lag shall be noted in the notebook file for that activity;
- k) Scheduling option that retains the current logic ("retained logic") of activities started out of sequence will be used. Where necessary, the logic for those activities for which the

- relationship is no longer applicable will be manually changed;
- l) Schedule time forecasting shall not be based upon the percentage of schedule completed. The scheduling control software function for linking remaining duration and such percentage shall be disabled;
 - m) Control Schedule will be structured to provide five (5) activity code fields, for summarization and reporting purposes, for exclusive use by Engineer. Each code field will be ten (10) characters in length and will be titled NALCOR1, NALCOR2, NALCOR3, NALCOR4 and NALCOR5. Engineer will provide the applicable coding to Contractor for inclusion within these code fields. Contractor will populate and maintain these code fields for all schedule activities;
 - n) Schedule calendars and activity codes will be prefixed with the six character package identifier and a dash (for example, "CH0007-"). This is to prevent potential data errors in the Engineer's planning system;
 - o) Schedule activity descriptions shall clearly identify the work associated with the activity, and shall be consistently applied throughout the schedule;
 - p) Activity durations shall not, in general, exceed twice the update frequency;
 - q) Start to Finish (SF) relationship types shall be avoided;
 - r) Open ends within the schedule network shall be avoided;
 - s) Network logic shall be consistently applied throughout the schedule;
 - t) The "Work Breakdown Structure" (WBS) shall not be the only coding system used within the schedule network. Activity codes are required to enable effective schedule development, review and analysis;
 - u) Gantt or bar chart displays shall have the current schedule bar assigned to position 1, with the baseline schedule bar assigned to position 2; and
 - v) Engineer will have free and direct access to all information associated with Contractor's progress and performance management systems, including planning, scheduling, progress measurement, person hours, resources and productivity data.

7.7 PROGRESS REPORTING

Contractor shall provide Weekly Reports and Monthly Progress Reports as described in Section 3 of this Exhibit 3 and, with respect to progress reporting, as more fully detailed below:

- a) Weekly Reports shall include the following:
 - Number of daily resources (headcounts and man-hours) by trade;
 - Progress table including quantities/statistics for current engineering, procurement, and fabrication/construction/installation/completions activities;
 - A Primavera two (2) week look ahead schedule with activities in-progress and completed in the previous week; and
 - A resource histogram showing a two (2) week look ahead and actual resources the previous week.
- b) Monthly Progress Reports shall include the following:
 - Planning and schedule control reports will be updated and issued monthly. Reports shall include the Control Schedule, Summary Schedule, tables, resource histograms, progress s-curves, document register, procurement plan, manufacturing schedule and support documentation. Contractor shall supply a copy of the schedule using

Primavera (P6 or later version) or equivalent, as well as hard copy format. If software other than Primavera is used, the native file shall have the capability to be easily converted to Primavera P6 and shall be subject to the Acceptance of Engineer;

- Deviations from schedule in time or progress, reasons for delays and deviations with recommended actions for recovery;
- Tabulation of project man-hours addressing planned, actual and forecast at completion;
- Progress table including quantities/statistics for current engineering, procurement, and fabrication/construction/installation/completions activities; and
- Identification of critical and sub-critical path(s).

8 CHANGES TO THE WORK

8.1 INTRODUCTION

This Section 8 sets forth minimum requirements for identifying and processing Changes in support of Article 14 of this Agreement.

Changes will be initiated in one of two ways:

- a) by completing a Change Request, in the form as attached to this Exhibit 3 as Appendix A – Change Request; or
- b) by the issuance of a Change Order (which includes a Field Work Order).

Change Orders will be in one of the forms set out in this Exhibit 3 - an interim document and a final document. The Field Work Order form is an interim document used for Company directed Changes issued at the Site. The maximum value of a Field Work Order, in the form as attached to this Exhibit 3 as Appendix H – Field Work Order, shall be limited to \$25,000.00. Company shall issue the final Change Order form for each Field Work Order or for a group of Field Work Orders. The final Change Order form shall also be used for Changes initiated by Change Requests and for any Change not subject of a Field Work Order.

Contractor shall specify its assessment of cost and schedule impacts in each Change Request or proposal presented in accordance with this Section 8.

If Company issues a Change Order (including a Field Work Order) to proceed with a Change on a reimbursable basis, Contractor shall prepare daily time sheets for Company's signature covering such Change and submit them to the Company within twenty four (24) hours where the Change is performed on Site, or within one (1) week where the Change was performed elsewhere, after such Change has been performed. Company's signature of Contractor presented time sheets shall not commit Company to any particular payment in respect of the Change, but shall serve as a record of events in the eventual resolution of any difference of opinion between Company and Contractor regarding the cost or schedule impacts of the Change. Contractor shall also present details of its assessment of any effect of the Change on the Control Schedule.

Company will be entitled to an equitable reduction in the Contract Price and/or an equitable

adjustment of the Control Schedule in respect of any reduction in the Work pursuant to a Change Order and in accordance with the provisions of Article 14 of this Agreement.

Contractor is not entitled to recover any costs related to preparation and administration of Change Orders, responses to Change Requests or preparation of Change Requests.

Each Change Order shall be deemed to take full account of the cumulative effects on the Contract Price and of all prior Change Orders.

8.2 ENGINEER REQUESTED CHANGES

Company may issue a Change Order (including a Field Work Order) directly to Contractor or may request a proposal from Contractor for a contemplated Change through Engineer by issuance of a Change Request.

Upon receipt of a Change Request from Engineer, Contractor shall prepare a proposal for the Change Request and submit it within five (5) Business Days to Engineer for further processing. Contractor's proposal shall include:

- a) A detailed execution methodology for the proposed Change;
- b) A detailed schedule for the execution of the Change and the impact on the Control Schedule;
- c) An estimated price for the Change using the items in the applicable Schedule(s) of Exhibit 2 - Compensation or if such Schedule(s) is not applicable, a lump sum price for the Change (if Contractor proposes any other method of compensation it must provide its rationale for that method); and
- d) Details of the impact on the Execution Plan, the Quality Plan, the health and safety plan referenced in Article 15.2 of this Agreement and the environmental protection plan referenced in Article 15.3 of this Agreement.

If Contractor cannot present the proposal for the Change Request to Engineer within five (5) Business Days of the receipt of the relevant Change Request from Engineer, Contractor shall promptly notify Engineer and provide reasons for the delay and the date the proposal will be ready. Contractor shall not unduly delay submission of the proposal to Engineer. Engineer, at its sole discretion, can reject any proposal not submitted in accordance with the requirements outlined herein.

Engineer will review Contractor's proposal within ten (10) Business Days and either Accept and return a Change Order (in the form as attached to this Exhibit 3 as Appendix B - Change Order) for Contractor execution or reject the proposal for resubmission or cancellation.

8.3 CONTRACTOR IDENTIFIED CHANGES

Contractor may request a Change by submitting a Change Request to Engineer. The Change Request will include:

- a) A detailed explanation of why Contractor considers that a Change has occurred along with

detailed support to enable Engineer to easily evaluate and assess the merits of the Change Request. Contractor shall specify the relevant provision(s) of the Agreement which it interprets as the basis for the Change Request;

- b) A detailed schedule for the execution of the Change and the impact on the Control Schedule;
- c) An estimated price for the Change using the items in the applicable Schedule(s) in Exhibit 2 - Compensation or if such Schedule(s) is not applicable, a lump sum price for the Change (if Contractor proposes any other method of compensation it must provide its rationale for that method); and
- d) Details of the impact on the Execution Plan, the Quality Plan, the health and safety plan referenced in Article 15.2 of this Agreement and the environmental protection plan referenced in Article 15.3 of this Agreement.

Contractor has the responsibility to identify, by the issuance of a Change Request, any change to the Work that it believes to be necessary for environmental integrity, or that will benefit Company in terms of capital or operating cost, or improved performance flexibility, safety or operation of the Work.

8.4 CHANGE ORDER PRICE

Contractor's proposed price for any Change will generally be stated as an estimate based on the rates in the applicable Schedule(s) in Exhibit 2 - Compensation or if such Schedule(s) is not applicable, then a lump sum price shall be proposed. If Contractor proposes any other method of compensation, it shall provide its rationale for such method. Contractor shall provide such substantiation as Company may reasonably request regarding such proposed price. Each lump sum price for a Change shall be determined using the rates and prices outlined in Exhibit 2 - Compensation or on a basis to be agreed between Engineer and Contractor if there are no applicable rates in Exhibit 2 - Compensation.

For any Change proposed to be compensated on a reimbursable basis, Contractor shall include an estimated total price for the Change in the Change Request or in its proposal in response to a Change Request. Changes performed on a reimbursable basis will be priced in accordance with Exhibit 2 - Compensation.

Each Change Order shall fully define the terms of payment and invoicing provisions.

Contractor shall not be entitled to additional compensation in respect of:

- a) Personnel already assigned full time to the Work, except when such Personnel are paid overtime, shift premiums or their assignment to the Work is extended, specifically in relation to the Change; and
- b) Contractor's Items already assigned full time to the Work, except when the hire period of rented items is extended specifically in relation to the Change.

8.5 CHANGE IMPACT ON CONTROL SCHEDULE

Contractor will submit to Engineer, all necessary information to support any proposed impact of

a Change on the Control Schedule, in both hard copy and electronic format. The information shall include detailed critical path analysis, identification and full accounting for the use of float and the current Control Schedule.

Each Change Order shall be deemed to take full account of the cumulative effects on the Control Schedule and all prior Change Orders. Due consideration will be given to cumulative effects that may not have manifested themselves in previous Change Orders, such as a Change that is accommodated by reducing available float. Any cumulative schedule effects assessed by Contractor must be supported by detailed analysis to account for the use of float. This analysis shall include an electronic version of the current Control Schedule that clearly highlights the schedule effects to enable Engineer to verify Contractor's analysis prior to the issuance of the relevant Change Order.

Contractor shall update the Control Schedule for Company's Approval within five (5) Business Days after Company's issuance of any Change Order affecting the Control Schedule.

8.6 CHANGE REGISTER

Contractor shall maintain, fully updated at all times, a register of all Change Requests and Change Orders (with Field Work Orders identified separately). The register will include:

- a) Change Request number and date;
- b) Change Order number and date and reference to a Change Request;
- c) Brief description of the Change;
- d) Status of Change Request and Change Order;
- e) Value;
- f) Effects on Control Schedule; and
- g) Brief description of the basis for the Change Request.

Each Change Request will be identified by means of a unique sequential reference number beginning with 1000 for any Change Request issued by Engineer and Company, and 2000 for any Change Request issued by Contractor. Each Change Order will be identified by means of a unique reference number, which will be assigned by Engineer.

All Change Orders that affect the Control Schedule shall be individually detailed, by reference number and summary description, in the successive Control Schedule updates issued by Contractor for Company's Approval.

Contractor shall submit the Change register in the Monthly Progress Report or more frequently as required by Engineer.

9 RISK MANAGEMENT

Requirements for ongoing risk management and reporting will be agreed between Contractor and Engineer at the kick-off meeting. If there is a failure to agree on such requirements,

Engineer shall have the authority to determine these matters. Engineer shall have the authority to specify the type of risks (such as schedule, quality, cost, safety and environmental) which shall be reported by Contractor. Some risks will be identified as “internal” risks, not subject to reporting.

9.1 RISK MANAGEMENT REQUIREMENTS

- a) Contractor shall establish and implement a risk management system to identify, address and manage safety, health and environment, cost, schedule, quality and other execution risks, for the duration of the Work.
- b) Contractor's risk management system shall be based on the following principals:
 - All risks shall be identified and captured in the Risk Register (as defined in Section 9.1(c) below);
 - All risk scenarios shall be evaluated for elimination or mitigation through appropriate measures; and
 - All higher and medium risk scenarios and associated risk management strategies shall be communicated and accepted by the appropriate level of Contractor's management.
- c) Contractor's risk management system shall include the following features:
 - Contractor shall develop a risk management plan indicating the formal risk process to be followed during Work execution, with risk assessment approach and frequency. The plan shall also include assessments required for safety, health and environment and execution risks referenced elsewhere in this Exhibit 3;
 - Contractor shall develop and maintain a risk register (“Risk Register”) to capture all details required to monitor identified risks. The format and content shall be subject to the Acceptance of Engineer. It shall be submitted as part of the Monthly Progress Report, along with other reporting requirements specified within this Exhibit 3;
 - Contractor shall perform risk assessments using qualified and knowledgeable Personnel. Contractor shall consult with Engineer regarding meeting target levels of safety. Contractor shall also include active involvement of Engineer's Personnel and external expertise, as appropriate;
 - Risk assessments and recommended prevention and/or mitigation measures shall be formally documented in the Risk Register;
 - Risk mitigation and prevention strategies for assessed risks in the higher and medium categories are required to be reviewed for acceptability by specified levels of Contractor's and Engineer's management. These strategies shall be supported by formal actions captured in an action log and be appropriate to the nature and magnitude of the risk, with decisions and updates clearly documented;
 - Results of formal risk assessments shall be considered in the preparation or review of emergency response plans and procedures; and
 - Follow-up processes to ensure that decisions have been implemented shall be formally documented and maintained in an action log. At a predetermined frequency, compliance reviews shall be undertaken to verify that formal risk assessments and follow-up actions are implemented.

- d) Where appropriate, Engineer shall be invited to observe and/or participate in risk assessments performed by Contractor. Results of risk assessments related to the Work shall be distributed to Engineer upon completion of any of the assessments included within Contractor's risk management plan.
- e) Contractor shall also participate in risk assessments conducted by either Engineer, Company or Company's Other Contractors when these risk assessments relate to activities for which interfaces exist with the Work or where Contractor is involved.

10 ENGINEERING REQUIREMENTS

10.1 INTRODUCTION

This Section 10 sets forth minimum requirements for engineering coordination in support of this Agreement, including Articles 3 and 37 of this Agreement, and the document entitled "LCP Supplier Document Requirements" provided in Exhibit 11 - Company Supplied Documents.

10.2 DOCUMENT REVIEW

Contractor shall comply with document submittal and review requirements provided in this Agreement.

10.3 VARIATIONS FROM REQUIREMENTS

If any drawings, specifications or data produced by Contractor, show variations from this Agreement's requirements, Contractor shall identify and describe such variations in writing to Engineer. If Contractor fails to identify such variations, it shall not be relieved of the responsibility for executing the Work in accordance with the Agreement, even though such drawings may have been reviewed by Engineer.

10.4 TECHNICAL QUERY PROCEDURE

Requests for clarification or guidance related to technical details contained within Company Supplied Data, shall be formally presented by Contractor to Company as a Site Query (SQ). Refer to Section 11 below for details on the use of an SQ.

11 CONSTRUCTION MANAGEMENT

11.1 OBJECTIVES

In executing the Work, Contractor shall, and ensure that the other members of Contractor Group shall:

- a) Assign experienced and qualified project management Personnel and craft workers with demonstrated skills during the field work / construction phase of the Work and provide continuity of such Personnel throughout the execution of the Work;
- b) Maintain adequate controls and oversight during the field work / construction phase of the

Work to ensure conformance with all requirements of this Agreement;

- c) Minimize Work execution risks and risks to Company's assets;
- d) Develop adequate contingency and recovery plans to mitigate impacts on schedule of unforeseen events (e.g. weather events); and
- e) Provide Worksite(s) that are safe, secure and free of industrial health hazards.

11.2 CONTRACTOR'S DUTIES

With respect to the Work, Contractor shall:

- a) Plan and co-ordinate the design, fabrication, transportation, installation, construction and completions of the Work with Engineer to ensure all interfaces are identified and managed;
- b) Identify execution risks and develop mitigation plans and procedures covering all reasonable events during the field work / construction phases;
- c) Conduct all engineering for field work, fabrication, transportation, construction and completions as stipulated in this Agreement;
- d) Prepare, maintain and implement:
 - emergency preparedness and response procedures;
 - detailed fabrication, construction, transportation and material management plans for major Worksites;
 - security measures at the Worksite; and
 - a health and safety program;
- e) Provide all construction and installation equipment, tools and temporary facilities required to perform the Work;
- f) Provide Personnel and facilities for all field testing, inspection, supervision and coordination activities associated with the Work;
- g) Support Company's construction management activities related to the Work; and
- h) Take all necessary precautions to avoid labour disputes and to minimize the disruption in the event of any dispute, all in compliance with Article 31 of this Agreement.

11.3 SITE QUERY (SQ)

The Site Query (SQ) process, as described in this Exhibit 3, shall be used by Contractor to facilitate the timely resolution of minor engineering and construction problems encountered at the Worksites. The SQ is used to formally transmit and co-ordinate technical queries with Engineer and to document the resolution to the query. Engineer shall not be involved in answering Site Queries which are entirely within Contractor's own responsibility.

Contractor may raise an SQ (in the form attached as Appendix E - Site query (SQ)) to clarify Technical Requirements which require a formal response. The SQ will include separate sections for Contractor's query and for Engineer's response. Any relevant documents that might assist those assigned to respond to the query in understanding the issue should be included or referenced with mark-ups as required. Contractor's SQ must be approved by an appropriate level of authority within Contractor's organization and submitted formally to Engineer (distribution list to be provided). Contractor shall assign an SQ number based upon the Accepted numbering system which will be provided to the Contractor.

Engineer shall review the SQ and provide a response within the appropriate section of the SQ. It will be Contractor's responsibility to implement any actions associated with the response. Responses may simply be explanatory in nature and require no additional action. Where appropriate, an SQ response may be accompanied by a Site Instruction (in the form attached as Appendix F - Site Instruction) or an Engineering Change Notice (in the form attached as Appendix G - Engineering Change Notice (ECN)). An SQ will remain open until any associated actions have been completed, to the satisfaction of Engineer.

Open SQs shall be reviewed at weekly Site meetings in order to resolve all matters relating to their resolution.

11.4 SITE INSTRUCTION (SI)

The Site Instruction (SI) process, as described in this Exhibit 3, shall be used to provide a formal record of an instruction or verbal agreement originated directly at Site from Engineer to the Contractor.

SIs (in the form attached as Appendix F - Site Instruction) will be provided to address the following items (examples only):

- a) Instructions to Contractor related to safety or quality;
- b) Confirmation of verbal instructions/notifications;
- c) Procurement activities;
- d) Site administration;
- e) Reporting requirements;
- f) Work clarification; and
- g) Instruction subsequent to a Site Query response.

Open SIs shall be reviewed at weekly meetings in order to resolve all matters relating to their implementation.

11.5 ENGINEERING CHANGE NOTICE (ECN)

The Engineering Change Notice (ECN) process, as described in this Exhibit 3, will be followed by Engineer to highlight the issuance of any engineering design change to the Contractor whenever:

- a) Issued for Construction (IFC) drawings or specifications are revised after their issue to Contractor;
- b) New IFC drawings or specifications are issued that are not listed in Exhibit 1 - Scope of Work; and
- c) IFC, sketches, documents or any such typical instructions are issued.

Engineer will generate an ECN, using the form found in Appendix G - Engineering Change Notice (ECN) of this Exhibit 3, to describe and communicate Issued for Construction (IFC) document changes to the Contractor. These changes will be described on the ECN form and accompanied

by the associated drawings, specifications, sketches and related documents for implementation by Contractor. Where an ECN is the result of an SQ or a SI, it will reference the relevant document. The ECN will be assigned a unique number by Engineer for future reference and reporting.

12 COMPLETIONS

12.1 OBJECTIVES

In executing the Work, Contractor shall ensure that all members of the Contractor Group shall:

- a) Assign experienced and qualified system completion management personnel and craft workers with demonstrated skills during equipment manufacture, site preparation and site installation/commissioning phases of the Work, and provide continuity of such Personnel throughout the execution of the Work;
- b) Maintain adequate controls and oversight during the equipment manufacture, site preparation and site installation/commissioning phases of the Work to ensure safety execution and conformance with all requirements of this Agreement;
- c) Minimize Work execution risks and risks to Company's assets;
- d) Develop adequate contingency and recovery plans to mitigate impacts on schedule of unforeseen events (e.g. weather events , equipment delivery delays); and
- e) Provide Worksites that are safe, secure, and free of health hazards.

12.2 CONTRACTOR'S DUTIES

With respect to the Work, Contractor shall:

- a) Plan and co-ordinate the completion scope with Engineer to ensure all interfaces are identified and managed safely by means of toolbox talks, job safety analysis , livening up notices, permit to work, and electrical and mechanical isolation processes. Refer to Exhibit 5 - Health and Safety Requirements for full details of responsibilities;
- b) Identify execution risks and develop mitigation plans and procedures covering all activities during field mechanical completion (MC) and commissioning phases;
- c) Provide manuals for:
 - Preservation;
 - Mechanical Completion; and
 - Commissioning;
- d) Provide detail procedures for:
 - Factory Acceptance Testing;
 - Preservation at factory and Site;
 - Mechanical Completion at factory and Site;
 - Static Commissioning;
 - Dynamic Commissioning;
 - Site Acceptance Testing; and
 - System Integration / performance testing;
- e) Plan, schedule and perform all activities relating to, and document results of:

- Factory Acceptance Testing;
- Preservation;
- Mechanical Completion;
- Static Commissioning;
- Dynamic Commissioning;
- Site Acceptance Testing; and
- System Integration / performance testing.

Section 7 (Schedule Management) provides the full detail of the schedule development requirements. For completions, the activities shall provide resourced logical sequence progression through MC and commissioning, with clearly identified responsibility handover points between MC and commissioning;

f) Prepare, maintain and implement:

- Livening up Notice procedure;
- Permit to work procedure; and
- Electrical and mechanical isolation procedure.

Adequate numbers of experienced Personnel shall be provided to administer and supports these processes. Refer to Exhibit 5 - Health and Safety Requirements for full detail of responsibilities;

- g) Provide all test equipment, facilities, commissioning and start-up spares, tools, special tools, first fills, lubricants and temporary facilities required to perform the completions scope of Work;
- h) Provide Personnel and facilities for all field testing, inspection, supervision and coordination activities associated with the completions scope of Work; and
- i) Provide Personnel and facilities, in accordance with the terms and conditions of this Agreement, to support ready-for-operations Site activities (RFO) of Company.

12.3 PRESERVATION

a) PRESERVATION PROCEDURES

Contractor shall prepare preservation procedures for all phases of the Work, including:

- Equipment shipping and storage; and
- Installed at Site and up to handover for Dynamic Commissioning.

Procedures shall, by equipment number and type, provide detailed instruction, compounds to be used and durations between preservation inspections. Material safety data sheets (MSDS) shall be provided for all preservation compounds.

b) PRESERVATION RECORDS AND REPORTS

Contractor shall maintain auditable records of completed preservation for each piece of equipment. The record shall include, as a minimum, the name, date, preservation method and a supervisory signature. At the point of MC handover to commissioning all equipment involved shall have a report which provides historical detail of completed preservation.

c) PRESERVATION AT CONTRACTOR'S SUPPLIERS' FACILITIES

The preservation requirements at Contractor's suppliers' facilities shall be in accordance

with the applicable Accepted supplier preservation procedure. The preservation requirements shall include but not be limited to all of the following:

- All equipment and devices shall be protected for shipment.
- The applicable supplier shall perform the initial preservation and document the preservation carried out.
- The type of storage facility and conditions required for the equipment shall be identified by the applicable supplier, e.g. outside storage, unheated warehouse, heated warehouse, air conditioned, etc.
- The preservation documentation, MSDS, procedure and records shall be included in the dispatch dossier and shall accompany the shipment of equipment to Site.

d) PRESERVATION AT SITE

The preservation activities at Site shall be completed in accordance with the Accepted Site preservation procedure. The preservation requirements shall include but not be limited to all of the following:

- Contractor shall be responsible for the preservation and protection of all free issue and supplier provided skid packages, equipment, material and devices.
- Preservation procedures provided by the equipment suppliers shall be followed.
- Preservation documentation and records of preservation maintenance carried out shall be kept by Contractor and be available for review by Engineer.
- Contractor shall energize any space heaters on receipt of equipment.
- Contractor shall establish a preservation team to carry out the preservation requirement and to establish the preservation program up to the MC handover of the equipment or system to commissioning/RFO. Should Company's RFO team require continuation of the preservation, then this will be noted and a request made to reinitiate the preservation by Contractor.
- An inspection/check of preservation damage shall be carried out by Contractor on receipt of equipment, materials, skid packages, fabricated elements and sub-assemblies. Deficiencies shall be noted by Contractor and brought to the attention of Engineer for resolution.
- Contractor shall store the equipment and material in accordance with the Accepted preservation procedure as stipulated by the applicable warehouse facility until ready for installation.

12.4 MECHANICAL COMPLETION

a) MECHANICAL COMPLETION (MC) AT CONTRACTOR'S SUPPLIERS' FACILITIES

The MC for Contractor's suppliers will typically apply to but not be limited to all of the following types of equipment:

- Supplier skid mounted packaged equipment, such as compressors, pumps, fans and driers. These skids can contain piping, instrument, electrical and mechanical equipment and in many cases have a local control cabinet which is wired and connected to the primary and final elements.

- Control panels.
- Switchgear and control centers.
- Transformers and electrical equipment.
- Electrical breakers, lightening arrestors and disconnects.
- Generators and generator components.
- Exciters.
- Control monitoring and communication equipment.
- Turbines and turbine components.
- Governors.
- Hydraulic gates.
- Materials for dams, dykes and structures.
- Penstocks.
- Cranes and hoisting machinery.
- Diesel generators.
- Rotating machinery skid mounted.
- Structural steel, concrete and building supplies.
- Transmission equipment.

In accordance with the requirements of Exhibit 4 - Supplier Document Requirements List, Contractor is required to provide details of the intended use mechanical completion inspection and test certificates and obtain Engineer Acceptance to implement them.

The completed signed and Accepted mechanical completion inspection and test certificate originals shall be included in Contractor final documentation. A copy is to be placed in the shipping dispatch dossier which accompanies the equipment to Site.

b) MECHANICAL COMPLETION AT SITE

The MC at the Site shall be completed in accordance with the installation Drawings, Specifications, standards, codes and all other Technical Requirements, and to good construction practices.

Contractor will be required to implement, populate, manage and maintain a Company provided completion program and database. Company will provide training and technical support.

Contractor is required to propose all discipline mechanical completion inspection and test certificates and obtain Engineer Acceptance to implement. Company reserves the right to provide standardized mechanical completion Inspection and test certificates for implementation.

Contractor will be required to implement Company provided forms and procedures for punch listing, mechanical completion handover and commissioning handover.

Contractor shall define by equipment tag number all discipline mechanical completion

inspection and test certificates required to cover the Work. Contractor shall obtain Engineer Acceptance of the definition. This will form the basis of the population of the completion program database.

All original completed, signed and Accepted MC and test certificates and documentation shall be included in Contractor final documentation.

The MC confirmations for the key disciplines shall include, but not be limited to, all of the following:

Structural Discipline

- Visual inspection for complete and correct installation in accordance with the latest drawings.
- Alignment and dimensional control checks.
- Verification that the specified Non-Destructive Evaluation (NDE) / Non-Destructive Testing (NDT) checks have been performed.
- Mechanical Discipline.
- Visual inspection of equipment for correct and completed installation in accordance with the latest drawings.
- Internal inspections of tanks, exchangers, fans, ductwork, etc.
- Alignment of rotating machinery.
- Alignment of turbines, generators and components.
- Correct assembly of turbine and generator components.
- Visual inspection of the generator ventilation systems.
- Load integrity of lifting machinery.
- Inspections and verification of correct and complete installation of pipe work.
- Verification of coatings.
- Verification that the specified NDE/NDT checks on piping, penstocks, etc. have been performed.
- Verification of color coding for pipes.
- Visual inspections of fire protection layout.
- Numbering identification of all mechanical components.
- Visual inspection of insulation and protective jackets over piping.
- Verification of alignment and seals of hydraulic gates.
- Flushing of lube and hydraulic oil systems to a specified standard.
- Verification of pressure vessel registration and CRN number.

Electrical Discipline

- Visual inspection of equipment for correct and completed installation in accordance with the latest drawings.
- Verification of electrical cable pulling, glanding, termination and testing.
- Numbering identification of all wiring and electrical equipment.
- Insulation and continuity of cables.

- Insulation and continuity testing of generators, transformers, motors, panels, distribution boards and other electrical equipment.
- Transformer oil analysis.
- Exciter, generator, transformer and governor checks.
- Grounding checks.
- Motor rotation checks.
- Heat tracing inspections and tests.
- Lighting circuit testing and illumination checks.
- Point-to-point test of cables.
- Verification of correct classification of electrical equipment in hazardous areas.

Transmission Discipline

- Visual inspection of overhead systems for complete and correct installation in accordance with the latest drawings and tables.
- Visual inspection of concrete and earth structures for correct and completed installation in accordance with the latest drawings.
- Verification of mapping and topographical controls and monitoring installations.
- Verification of accuracy and secure storage of geotechnical data.
- Verification of tower numbering and safety signage.
- Verification of underwater dc cable supports.
- Coating checks.
- Alignment checks.
- Dimensional control inspections and tests.

- Grounding, insulation and phasing checks.
- Verification of structure list.
- Instrument Discipline (includes telecommunication).
- Calibration and testing of instruments and telecommunication devices.
- Visual inspection of equipment for correct and completed installation in accordance with the latest drawings.
- Verification of electrical cable pulling, glanding, termination and testing.
- Insulation and continuity testing of instrument / telecommunications cabling.

Civil Discipline

- Visual inspection of concrete and earth structures for correct and completed installation in accordance with the latest drawings.
- Visual inspection of layout of the underwater tunnels for correct and completed installation in accordance with the latest drawings.
- Verification of functionality of structural and architectural features (such as gates, doors, windows).
- Verification of surface conditions and treatments on excavations, concrete and earth structures, and access roads.

- Visual inspection of downstream side of dams and structures for water leaks.
- Verification of drainage facilities (weirs, culverts, ditches, etc.).
- Verification of mapping and topographical controls and monitoring installations.
- Verification, calibration, base-lining and testing of geotechnical monitors.
- Verification of accuracy and secure storage of geotechnical data.
- Verification of correct and sufficient site safety signage during and after construction.

Environmental Discipline

- Visual inspection of environmental mitigations.
- Monitoring and verification of aquatic habitat performance and productivity.
- Monitoring and verification of terrestrial habitat performance and productivity.
- Verification of fish passage facilities (culverts).
- Visual inspection of construction areas for waste spills and cleanup.

12.5 COMMISSIONING

Abbreviations

FAT: Factory Acceptance Test
SCT: Site Commissioning Test
SAT: System Acceptance Test
ISC: Integrated System Commissioning

Static Commissioning: Non-operating powered equipment checks which prepare equipment ready for Dynamic Commissioning of equipment.

Dynamic Commissioning: In preparation for start-up, the operating of equipment and systems in order to verify the functionality is as per design requirements.

Commissioning At Contractor's Suppliers' Facilities

The commissioning at Contractor's suppliers' facilities shall be in accordance with the Accepted FAT procedure. Such commissioning shall not be considered to be the final system commissioning, which can only be carried out when the equipment being tested is installed and tested at Site and is connected up to the rest of the facility as per the system design.

The FAT shall provide assurance that the equipment meets the design requirements on a standalone basis and can meet the system design performance requirements. A successful FAT is the first step on the way to a successful system completion process. A representative from the Engineer will attend the FAT of key pieces of equipment, such as control system configuration tests, large rotating machinery, emergency generators, turbines, transformers, compressors, exciters, governors, electrical equipment, control and monitoring systems. Contractor shall ensure that the applicable supplier shall facilitate Engineer's attendance. Contractor shall ensure that such supplier shall prepare a report of the completed FAT inclusive of a record of all inspections, tests and readings taken. The report shall be subject to the

Acceptance of Engineer and shall be part of the Contractor final documentation submission.

Commissioning At Site

a) Discrete Site:

Contractor is responsible for all preparation and execution of Static and Dynamic Commissioning activities at each site. Oversight will be provided by Engineer and Company's RFO team. All completed checks shall be documented in a report of the completed site commissioning procedure, inclusive of all inspections, tests and readings taken. The report shall be subject to the Acceptance of Engineer and form part of the Contractor final documentation. The report shall be made available to the Ready for Operation (RFO) team at Site.

Static Commissioning checks typically include, but are not limited to, all of the following:

- High voltage injection test.
- Power on tests.
- Relay tests.
- High potential tests.
- Loop checks and logic function tests.
- Load tests.
- HVAC air flow tests.
- Pump tests.
- Battery system backup tests.
- Compressed air systems test.
- Alarm settings and verification.
- Valve position verification.
- Pressure safety valve testing.
- Rotation tests.
- Lube and hydraulic oil cleanliness checks.
- Opening/closing gate tests.
- Start/stop motor testing.
- Shutdown logic tests.
- Control and Monitoring offline checks.
- Excitation checks.
- Verification of governor response tests.
- Verification of turbine operating parameter tests.
- Verification of emergency intake closure (all location).
- Drainage and dewatering system tests.
- Oil interception tests.
- ac Transmission line connection checks.
- dc Transmission line connection checks.
- Fire protection systems tests.
- Cooling water filtration tests.

The Dynamic Commissioning / system commissioning activities typically include, but are not limited to, all of the following:

- Energizing all ac and dc transmission lines.
- Reservoir water impoundment.
- Tunnel(s) water impoundment.
- Fish habitat water impoundment.
- Watering up penstock.
- Black start checks.
- Startup/shutdown tests.
- Trips and alarm tests.
- Baseline data recording.
- Incremental speed rolls of turbine/generator to ensure mechanical balancing.
- Incremental loading of turbine generator and power transformer.
- Electrical power distribution in-plant tests.
- Remote operation tests.
- Load rejections during incremental loading of turbine generator to verify penstock pressure loading.
- Verification of generator winding temperatures, bearings temperatures, rotor stability, and turbine carbon seal leakages, etc. are within acceptable limits.
- Verification of the functionality of the control and monitoring system.
- Verification of contract warranties and/or guarantees, such as power output, turbine and generator efficiency, transformer losses, etc.

b) Multi Site Integrated System Commissioning:

With technical input from Contractor, Company's RFO team will prepare integrated system commissioning (ISC) procedures. The procedures will incorporate equipment and system acceptance criteria as determined by Accepted Contractor documentation and procedures. Such RFO team is responsible for the execution and Acceptance of all system commissioning activities. Contractor shall provide, as required by Engineer, technical and skilled Personnel support to such RFO team. The key prerequisite of ISC is the Contractor completion of discrete site commissioning procedures and subsequent handover to such RFO team.

13 INVOICING AND PAYMENT

13.1 OBJECTIVES

Contractor shall submit accurate, complete and detailed invoices that reflect the Work completed by Contractor, in a format that will be established by the Engineer and with the necessary supporting/verification documentation to enable Engineer to efficiently attest the invoices and recommend Approval and payment of Contractor's invoices by Company, and all in accordance with the Articles of this Agreement.

13.2 CONTRACTOR'S DUTIES

- a) Contractor shall submit invoices in accordance with this Agreement complete with Company Approved Payment Certificates and all supporting/verification documentation Acceptable to Engineer.
- b) Contractor shall submit to Engineer, a monthly report that summarizes invoices submitted and payments made, along with applicable dates of both the invoices and the payments and other pertinent information that Engineer or Company may require.
- c) Contractor shall submit to the Engineer, each month, a cash forecast report by currency for the following three (3) months. This report shall be submitted by the 25th day of every month.

13.3 PROCEDURAL REQUIREMENTS

- a) Contractor shall submit to Engineer one original invoice, along with one (1) PDF copy of the invoice and all required Billing Information. At Engineer's request, all supporting schedules and calculations supporting the invoice shall be provided in native file format.
- b) Each invoice shall be organized such that it is easily understood and:
 - contains a clear description of the completed Work being invoiced;
 - the charges can be easily and efficiently verified against the Agreement and the Billing Information; and
 - all charges are clearly cross referenced to the Billing Information.
- c) All invoice amounts shall be detailed based on Company's code of accounts.
- d) The invoice shall include the following information:
 - i. Contractor's name, address and tax identification number (HST registration number);
 - ii. Invoice date and invoice number;
 - iii. Agreement number and name;
 - iv. Charges detailed by code of accounts along with cumulative value of all invoices for the Agreement detailed by Company's code of accounts;
 - v. Adjustments, if any, from prior invoices;
 - vi. Subtotal, tax (HST applicable to the invoice) and total;
 - vii. All invoices shall be in the currencies detailed in Exhibit 2 - Compensation;
 - viii. Complete and accurate supporting documentation, including without limitation Billing Information and any other pertinent information that Company may require to verify completion of the Work, the accuracy of the fees, charges and third party charges; complete with a summary sheet cross referencing all supporting documentation to the charges covered on the invoice;
 - ix. Approved Payment Certificate (in the form as stated in Appendix D - Payment Certificate);
 - x. If Contractor is a non-resident, in accordance with Exhibit 10 – Declaration of Residency, Contractor shall note on each invoice whether any portion of the Work covered by such invoice was performed inside or outside of Canada for the purposes of Canadian income tax legislation, or such other information requested or required by Company to properly assess withholding requirements; and
 - xi. Where appropriate, Change Order amounts may be shown separately and the invoice will itemize charges associated with each Change Order, including without

limitation, a detailed description of each item being invoiced. A copy of the Change Order shall accompany the invoice.

- e) Before Company pays an invoice, Company may request clarification or substantiation in relation to any charges on the invoice and Contractor shall promptly comply with any such request. Invoice review meetings (or pre-payment meetings) may be held to agree on charges to be included on an invoice.
- f) If an invoice is deemed incorrect by Company, Company is entitled to reject such invoice and shall provide reasons for the rejection.
- g) A Final Completion Certificate will be required before final payment will be made. When Contractor believes the requirements of Final Completion have been satisfied, as described in Article 25 of the Agreement, Contractor shall request by Notice a Final Completion Certificate. Such request shall be in the form as contained in Appendix C - Request and Final Completion Certificate.

Invoicing for Change Work

Contractor shall submit separate invoices for Changes, unless Engineer Accepts otherwise, with the Change Order number and date mentioned on the invoice. Invoicing provisions shall be specified on each Change Order. All Changes shall be subject to the compensation provisions and payment terms set out in Article 12 of this Agreement, Exhibit 2 – Compensation and Exhibit 3 – Coordination Procedures.

Contractor will not invoice Company for any amounts which result in the cumulative amount invoiced being greater than the Contract Price.

Under no circumstances will Contractor present invoices for a Change, nor will Company compensate Contractor for any Change, in the absence of a Change Order.

Banking Information

- a) Payments of invoices shall, where possible, be made by electronic funds transfer to Contractor's bank account, as specified in writing by Contractor to the Company Representative.
- b) Any changes in Contractor's banking information or payment instructions shall be submitted in writing to the Company Representative. The Company shall not be held responsible for errors or delays resulting from incorrect or delayed submission of changes in banking instructions by Contractor.

14 INFORMATION MANAGEMENT

14.1 SCOPE

This Section 14 provides the minimum requirements in relation to information management (IM) which includes the areas of records and document management and control.

14.2 OBJECTIVES

- A. To establish an effective IM environment for the execution of this Agreement, where people can work safely and collaboratively with a confidence that information, and the systems that manage it, are accessible, accurate, reliable, up to date and timely throughout the Term.
- B. For the function of IM and its associated processes, to be seen as an enabler and not a hindrance to project progress and success.
- C. To establish clear communication methods for the exchange of information, both technical and non-technical.
- D. To use standards (electronic formats, physical formats, data, numbering, etc.) to ensure a consistent information deliverable for incorporation into Company systems, regardless of origin.
- E. To produce and deliver a quality information asset that will support and enable the ongoing operation and maintenance of physical assets.
- F. To provide the people, processes and tools required to facilitate and enable efficient and effective IM practices for the execution of this Agreement.
- G. To ensure that adequate orientation, training and guidance is provided to all team members in the specific areas of IM and supporting systems.
- H. Personal, confidential and restricted information shall be handled using best practice protocol to ensure access to only authorized Personnel in both the physical and electronic environments.
- I. No incidents of illegal information brokering as Contractor performs the Work.

14.3 CONTRACTORS DUTIES

Contractor shall:

- A. Develop an IM plan (including procedures, organizational charts, systems, training programs, etc.) to address the following areas of IM:
 - a. Administrative records management; and
 - b. Document management/control (engineering services, Contractor, procedural, etc.);
- B. Adhere to the documents included in Exhibit 11 - Company Supplied Documents;
- C. Provide statistical and status reporting for documentation and data as defined by Company;
- D. Ensure all IM related standards and procedures agreed between Company and Contractor are followed by Contractor's Personnel;
- E. Facilitate inspections and assessments of IM processes and systems by the Company Representative for Contractor Group;
- F. Provide process improvement suggestions throughout the Term where there are efficiencies to be gained; and
- G. Highlight and work to resolve any IM related issues relating to the Work.

14.4 COMPANY'S AUTHORITY

Company shall have the authority to:

- A. Provide general oversight to the IM components relating to the execution of this Agreement;
- B. Review and Approve plans and procedural documentation created by Contractor in support of IM for the execution of this Agreement;
- C. Conduct inspections and assessments of Contractor Group's IM programs and systems as appropriate;
- D. Provide statistical reporting requirements to Contractor as required;
- E. Provide applicable IM related standards to Contractor;
- F. Identify restricted information as appropriate;
- G. Provide process improvement suggestions throughout the Term where there are efficiencies to be gained; and
- H. Highlight and work to resolve any IM related issues or inefficiencies relating to the execution of this Agreement.

14.5 SPECIFIC REQUIREMENTS

14.5.1 ADMINISTRATIVE RECORDS

- A. Contractor shall maintain a distinct set of project related administrative records consisting of all non-revision controlled information received or created/generated in support of the Work. Administrative records shall be managed in an electronic content environment. Contractor shall provide reports of these records upon request from Company. Contractor shall provide copies of records as requested by Company at any point during the Term.
- B. Contractor may use existing file plans and classification systems within its own organization, but shall capture all communication with Company using Aconex.
- C. Contractor shall maintain a correspondence register within Aconex.
- D. Formal correspondence shall be by letter and shall be limited to one subject per letter. The subject line shall include reference to Agreement numbering as well as the specific subject.
- E. All correspondence shall be sent by Aconex. Use of signed PDF documents is acceptable. Details on the use and application of Aconex will be provided by Company and addressed at the kick-off meeting accordingly. Contractor shall be aware of the following:
 - a. Aconex is a cloud based computer software program that can be accessed via an internet connection and a web browser (www.aconex.com).
 - b. Aconex Project Mail is a module within Aconex that can be used to send and receive emails similar in function to most other email software systems (i.e., Microsoft Outlook, Lotus Notes, etc.).
 - c. Tutorials for using Aconex and Aconex Project Mail are available at (www.aconex.com).
 - d. Aconex serves as an electronic project mailroom and archive.
 - e. All correspondence relating to the project can be created, delivered, recorded and archived by the system.
 - f. On Aconex, project mail is not held in individuals' folders but in a company mailbox, the equivalent of a central filing system.
 - g. Correspondence is available to all project participants within the organization and

confidentiality can be enabled when required.

- h. All project mail is delivered on company specific templates, maintaining a firm's identity within the project.
- i. Aconex mail functions are very familiar, as they mirror standard email packages.
- j. Files may be attached to any piece of project mail from the controlled documents register, or the local drive or network.
- k. Hard copy letters and existing documents can be captured into the system through a scan/registration process, ensuring all correspondence is logged.
- l. All project mail is automatically logged and cannot be deleted or modified once sent.
- m. Mail can be filtered by a variety of attributes, free text and wildcards. Mail to or from any members within a company or project can be found instantly, ensuring accountability and full quality assurance.
- n. Support for the use of this system can be provided from Aconex at 1-888-5-ACONEX or speak with any member of the LCP Information Management Team (LCPDCC@lowerchurchillproject.ca).

14.5.2 DOCUMENT MANAGEMENT/CONTROL

- A. Company will facilitate the document numbering upon submission by Contractor of the initial Supplier Document Register as per Exhibit 4 – Supplier Document Requirements List. All documents, and all pages and sheets within, shall bear this number and the associated revision number.
- B. All documents shall be prepared and submitted by Contractor in accordance with the document entitled “LCP Supplier Document Requirements” (as provided in Exhibit 11 - Company Supplied Documents) and as required under Exhibit 4 – Supplier Document Requirements List.

APPENDIX A
CHANGE REQUEST

APPENDIX B

CHANGE ORDER

**CHANGE ORDER (CO)
Between
Company and Contractor**

Agreement No: _____	CO No. _____
Agreement Title: _____	Rev. No: _____
Company: _____	CR No. _____
Contractor: _____	Date: _____
Description of Change:	
Supporting information that forms part of this Change Order:	
Change Includes: <input type="checkbox"/> Price <input type="checkbox"/> Schedule Adjustment Type: <input type="checkbox"/> Lump Sum <input type="checkbox"/> Unit Rate <input type="checkbox"/> Fixed Amount <input type="checkbox"/> Estimate <input type="checkbox"/> Reimbursable	Original Contract Price _____ Value of this Change Order _____ Previous Contract Price _____ <hr/> Total Contract Price \$ _____
Impact on Control Schedule:	
Revised Finished Date: _____	
This Change Order shall form and be read and construed as an integral part of the above-noted Agreement. The above adjustment to the Contract Price constitutes full compensation (including all impact costs) to the Contractor for the above Change.	
Issued by: Company _____ Signature: _____ Name: _____ Date: _____	Acknowledgement of Contractor Receipt: _____ Signature: _____ Name: _____ Date: _____

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APPENDIX C

REQUEST AND FINAL COMPLETION CERTIFICATE

REQUEST FOR FINAL COMPLETION CERTIFICATE

Agreement No.: _____

Agreement Title: _____

Contractor: _____

To Engineer:

In accordance with Article 25 of the Agreement, Contractor hereby confirms that it has completed the Work and all the requirements of Final Completion (as described in the Agreement) have been met, all in accordance with the Agreement, excluding its Warranty obligations.

Contractor agrees that, as of the date of its confirmation below, the Contractor waives, remises, releases and discharges the Company of any and all Claims that are known, ought to have been known or discoverable by reasonable means by the Contractor, which Contractor has or may have relating to or arising out of this Agreement and the subject matter of this Agreement, and all facts and circumstances related to the Work, save and except:

- a) Only those Claims previously submitted by Contractor in writing and remaining unresolved prior to the date of Contractor's below confirmation, as listed below:

_____;

and

- b) The balance of the Contract Price payable, if any, upon the issuance of this Final Completion Certificate.

<p>Contractor Confirmation:</p> <p>Contractor confirms it has completed the Work in accordance with the above-noted Agreement.</p> <p>By: _____ Contractor Representative</p> <p>Acknowledgement of Engineer Receipt:</p> <p>By: _____ Engineer</p> <p>Date: _____</p>
--

FINAL COMPLETION CERTIFICATE

Agreement No.: _____

Agreement Title: _____

To Contractor:

Company hereby confirms that the Date of Final Completion of the Work is **[date]**.

By: _____
Company Representative

Date:

APPENDIX D

PAYMENT CERTIFICATE

PAYMENT CERTIFICATE

Date: _____
 Agreement #: _____
 Agreement Title: _____
 Contractor: _____

Milestone / Monthly Progress
 Payment Description: _____
 Milestone / Monthly Progress
 Payment Amount: _____

Work Executed for Monthly Progress / Milestone Completion criteria and status (list below):

Contractor:

Contractor hereby notifies Company that it considers that it has executed the associated Work or met the criteria for achieving the above-noted Milestone(s) and requests Company Approval.

By: _____
Contractor Representative

Date:

Company Approval:

Company hereby Approves this Payment Certificate. Company Approval of this Payment Certificate does not relieve Contractor of any of its obligations under the Agreement.

By: _____
Company Representative

Date:

APPENDIX E

SITE QUERY (SQ)

APPENDIX F

SITE INSTRUCTION (SI)

LOWER CHURCHILL PROJECT	SITE INSTRUCTION (SI)
------------------------------------	------------------------------

Company: <input type="text"/>	Date <input type="text"/>	Rev. <input type="text"/>	Page of <input type="text"/>
Project Name & Location: <input type="text"/>	Site Instruction No. <input type="text"/>		
Contractor: <input type="text"/>	<i>DISTRIBUTION (NAME PLUS DISCIPLINE OR COMPANY)</i> From: <input type="text"/> To: <input type="text"/> Copies to: <input type="text"/>		
Agreement No.: <input type="text"/>			
Agreement Title: <input type="text"/>			
Plant Area / Bldg No.: <input type="text"/>			
Reference Specification: <input type="text"/>			
Reference Drawing No.: <input type="text"/>			

The Contractor agrees that by signing acceptance of this Site Instruction, the contents hereof do not contain or imply any additional money or schedule effect in the above-noted Agreement whatsoever.

Instruction:

Reason:

	TITLE	NAME	SIGNATURE	DATE
Prepared by:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Accepted by:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

DISTRIBUTION

- | | | |
|---|--|--|
| <input type="checkbox"/> File
<input type="checkbox"/> Contractor
<input type="checkbox"/> Area Construction Manager
<input type="checkbox"/> Environment
<input type="checkbox"/> QA Coordinator | <input type="checkbox"/> Planner
<input type="checkbox"/> Estimator
<input type="checkbox"/> Chief Inspector
<input type="checkbox"/> Cost Controller
<input type="checkbox"/> Document Control (site) | <input type="checkbox"/> Resident Engineer
<input type="checkbox"/> Contracts Administrator
<input type="checkbox"/> Commissioning
<input type="checkbox"/> Other _____
<input type="checkbox"/> Other _____ |
|---|--|--|

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APPENDIX G

ENGINEERING CHANGE NOTICE (ECN)

Lower Churchill Project	Engineering Change Notice (ECN)	Page 1 of 2	
		Revision	
		No.	Date
		00	

Company: Project:	ECN No.:
----------------------	----------

Agreement No.	Contractor
Agreement Title	

Distribution		
From	To	Copy to

Summary Description of Changes

Instruction to Contractor	
<input type="checkbox"/> Submit impact on contractual terms prior to proceeding with the work	<input type="checkbox"/> Lump Sum <input type="checkbox"/> Unit Price <input type="checkbox"/> Cost Plus
<input type="checkbox"/> No impact on the contractual terms, proceed with the work	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/>	

Received by Contractor		
_____ Name	_____ Signature	_____ Date

	Title	Name	Signature	Date
Prepared by:				
Reviewed by:				
Approved by:				

LCP-SN-CD-0000-SC-FR-0046-01

APPENDIX H

FIELD WORK ORDER (FWO)

LOWER CHURCHILL PROJECT	FIELD WORK ORDER (FWO)
------------------------------------	-------------------------------

Company: <input style="width: 80%;" type="text"/>	Date <input style="width: 80%;" type="text"/>	Rev. <input style="width: 80%;" type="text"/>	Page of <input style="width: 80%;" type="text"/>
Project Name & Location: <input style="width: 80%;" type="text"/>	Field Work Order No. <input style="width: 80%;" type="text"/>		
Contractor: <input style="width: 80%;" type="text"/>	<i>DISTRIBUTION (NAME PLUS DISCIPLINE OR COMPANY)</i> From: <input style="width: 80%;" type="text"/> To: <input style="width: 80%;" type="text"/> Copies to: <input style="width: 80%;" type="text"/>		
Agreement No.: <input style="width: 80%;" type="text"/>			
Agreement Title: <input style="width: 80%;" type="text"/>			
Plant Area / Bldg No.: <input style="width: 80%;" type="text"/>			
Reference Specification: <input style="width: 80%;" type="text"/>			
Reference Drawing No.: <input style="width: 80%;" type="text"/>			
Description of the Work: <input style="width: 95%; height: 190px;" type="text"/>			
Reason: <input style="width: 80%;" type="text"/>	Trend Type: <input style="width: 80%;" type="text"/> Trend No.: <input style="width: 80%;" type="text"/> Allocated Budget: <input style="width: 80%;" type="text"/> Code of Account: <input style="width: 80%;" type="text"/>		
Schedule Impact: <input style="width: 80%;" type="text"/>			
Work Start Date: <input style="width: 80%;" type="text"/>			
Lump Sum Price: <input style="width: 80%;" type="text"/>	Estimated Price: <input style="width: 80%;" type="text"/>	Unit Price <input type="checkbox"/>	Time & Materials <input type="checkbox"/>
Acknowledgment of Receipt: Contractor: _____ <div style="display: flex; justify-content: space-around; width: 100%;"> Signature Title Date </div>			
Company: _____ <div style="display: flex; justify-content: space-around; width: 100%;"> Contract Administrator Area Construction Manager </div> <div style="display: flex; justify-content: space-around; width: 100%;"> Date: Date: </div>			

In no case shall this Field Work Order (FWO) exceed \$ 25,000

LCP-SN-CD-0000-SC-FR-00XX-01

EXHIBIT 4

SUPPLIER DOCUMENT REQUIREMENTS LIST

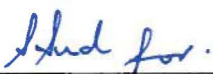
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CD0503-002
EARTHWORK at Soldiers Pond

Prepared by: 
Rami Wadhwa/Qi Hu

Reviewed by: 
Satish Sud/Bruce Colpitts

Approved by: 
Ken Morrison

Approved by: 
Mohamad Makky

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- 2. Supplier Document Requirements List**
- 3. Supplier Documentation Requirements Descriptions**
- 4. Legend / Instructions**
- 5. Supplier Document Register**
To be completed by the Supplier or Contractor

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REVISION LIST

Revision						Remarks
N°	By	Chec.	Appr.	Appr.	Date	
C2	AV/QH	MM	KM	SS	06-Nov-2013	Re-issued for Construction
C1	AV/QH	MM	KM	SS	28-OCT-2013	Issued for Construction

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SUPPLIER DOCUMENT REQUIREMENTS TABLE

SDRL Code	Type of Document	Provide with Proposal	Submit Prior to Start of Fabrication / Construction	After Shipment	With Shipment	Minimum Documents approved Coded 1 prior to Inspection Release	As Built	Final Documentation Location (R01 / R02 / R05/ R99)	Final File Format	Submission Requirements Date Required - Weeks After Receipt of Order (ARO)	Submission Requirements Monthly	Notes
A. GENERAL												
A01	Supplier Document Register (SDR)	1E+1P							Excel	2		Update and submit as requested.
A02	Control Schedule	1E+1P								2		
A03	Monthly Risk Reports										X	
A04	Risk Management Plan	1E+1P								2		
A06	Monthly Progress Reports										x	
A07	Project Execution Plan	1E+1P								2		
A08	Permits		1E+1P							3		
A28	Health and Safety Plan	1E+1P								3		
A35	Contract Specific Environmental Protection Plan (C-SEPP)	1E+1P								3		
A39	Survey Report		1E+1P				1E+2P		DWG			To be updated as required
A40	Monthly Environmental Performance Report										x	
A41	Health and Safety Training Records and Certificates		1E+1P									
A42	Schedule Development and Control Plan									2		
A44	Control Schedule Baseline Document		1E+1P									
A99	Miscellaneous General Documents		1E+1P									
B. ARRANGEMENT DRAWINGS												
B01	General Arrangements and Layouts		1E+1P				1E+2P		DWG			
B02	Elevation/Profile Drawings		1E+1P				1E+2P		DWG			
B03	Cross Section Drawings		1E+1P				1E+2P		DWG			
B99	Miscellaneous Arrangement Drawings		1E+1P				1E+2P		DWG			
G. SCHEDULES/LISTS												
G01	Bill of Materials	1E+1P					1E+2P					
G05	Preventative Maintenance Schedule	1E+1P					1E+2P					To be updated as required
G99	Miscellaneous Schedule/List Documents		1E+1P				1E+2P					
H. CALCULATIONS												
H32	Survey Calculation		1E+1P				1E+2P		DWG			To be updated as required
H34	Structure Stability Calculation		1E+1P				1E+2P		DWG			Applicable for Design Build Portions only. To be updated as required.
H37	Blasting Calculation		1E+1P				1E+2P		DWG			To be updated as required
H99	Miscellaneous Calculations Documents		1E+1P				1E+2P					
J. PERFORMANCE DATA												
J10	Soil Gradation Analyses		1E+1P				1E+2P					To be updated as required
J12	List of Environmental Emission and Effluent		1E+1P				1E+2P					
J90	Asphalt Concrete Mix Design Submittal for Asphalt Paving Design, Supply and Construction		1E+1P				1E+2P					

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SUPPLIER DOCUMENT REQUIREMENTS TABLE												
SDRL Code	Type of Document	Provide with Proposal	Submit Prior to Start of Fabrication / Construction	After Shipment	With Shipment	Minimum Documents approved Coded 1 prior to Inspection Release	As Built	Final Documentation Location (R01 / R02 / R05/ R99)	Final File Format	Submission Requirements Date Required - Weeks After Receipt of Order (ARO)	Submission Requirements Monthly	Notes
J91	Certificates of Materials for Asphalt Paving Design, Supply and Construction		1E+1P				1E+2P					
J99	Miscellaneous Performance Data Documents		1E+1P				1E+2P					
K.	PROCEDURES											
K24	Construction Method Statements and Procedures	1E+1P					1E+2P					
K99	Miscellaneous Procedures Documents		1E+1P				1E+2P					
M.	TEST & INSPECTION REPORTS											
M26	Reports for Sample Tests		1E+1P				1E+2P					To be updated as required
M90	Test Results for Asphalt Paving Construction						1E+2P					
M99	Miscellaneous Test & Inspection Reports		1E+1P				1E+2P					To be updated as required
Q	QUALITY ASSURANCE / QUALITY CONTROL											
Q01	Quality Assurance System Registration Certificate	1E+1P					1E+2P					If applicable
Q03	Quality Plan	1E+1P	x				1E+2P					
Q04	Inspection and Test Plan(s) (Factory and Site Works)	1E+1P	x				1E+2P					
Q07	Internal/External Audit Schedule	1E+1P					1E+2P					
Q10	NCR Register and associated close out reports						1E+2P				x	
Q12	Declaration of Installation and Inspection Completion						1E+2P					
Q13	Authorized Deviations						1E+2P					
R.	MANUALS											
R99	As-Built Drawings						1E+2P					

Lower Churchill Project	Supplier Document Requirements List (SDRL) EARTHWORK at Soldiers Pond		Revision		Page
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SDRL Definitions					
A	A - General				
A01	Supplier Document Register (SDR)	Supplier Document Register (SDR) – documents list identifying individual document deliverables by purchase order. This register will capture deliverable requirements as agreed by Contractor/Supplier and Company. Contractor is responsible to create and approve this document as a revision controlled document.			
A02	Control Schedule	As per Exhibit 3 Coordination Procedure			
A03	Monthly Risk Reports	Provides a summary of activities carried out by a Contractor/Supplier aimed at addressing selected Risks; The monthly Risk Reports, inclusive of the Risk Register, are part of the subject matter of the Monthly Risk Reviews. The requirements for the Monthly Risk Report and Risk Register are set forth in sections 2.3 and 2.4 of the LCP Risk Management Requirements for Contractors and Suppliers (SLI document # 505573-0000-39RA-I-0002).			
A04	Risk Management Plan	Provides a description of the Risk Management Process, organizational context and tools adopted by a Contractor/Supplier. The contractor shall prepare the Risk Management Plan using as guidance section 2.2 of the <i>LCP Risk Management Requirements for Contractors and Suppliers</i> (SLI document # 505573-0000-39RA-I-0002).			
A06	Monthly Progress Reports	As per Exhibit 3 Coordination Procedure.			
A07	Project Execution Plan	As per Exhibit 3 Coordination Procedure.			
A08	Permits	Provide copies of all permit documentation, as described in Exhibit 6 (Environmental and Regulatory Compliance Requirements)			
A28	Health and Safety Plan	As per Exhibit 5 Health and Safety Requirements.			
A35	Contract Specific Environmental Protection Plan (C-SEPP)	The Contractor shall prepare its C-SEPP using as guidance the <i>Contract-Specific Environmental Protection Plan template</i> (Nalcor document No. LCP-SN-CD-0000-EV-PL-0006-01)			
A39	Survey Report	Field Survey Reports. Example: roads, transmission lines, etc.			
A40	Monthly Environmental Performance Report	A Monthly Environmental Performance Report shall be submitted by the Contractor, in accordance with provisions of Exhibit 6 (Environmental and Regulatory Compliance Requirements). This report shall include a Monthly Fuel Consumption Report in the format prescribed in Exhibit 6, Appendix C.			
A41	Health and Safety Training Records and Certificates	Training records and certificates for employees including, but not limited to, Confined Spaces, Fall Protection, Operator Competencies, Trade Certifications, etc.			
A42	Schedule Development and Control Plan	As per Exhibit 3 Coordination Procedure.			
A44	Control Schedule Baseline Document	As per Exhibit 3 Coordination Procedure.			
A99	Miscellaneous General Documents	As described in the procurement documents and on SDRL or considered necessary by Vender/Supplier.			
B	B - ARRANGEMENT DRAWINGS				
B01	General Arrangements and Layouts	Mark-up IFC Drawings, as work progresses, proving detail and information of existing and prepared Site Work including notes, elevations, sections, dimensions and details.			
B02	Elevation/Profile Drawings	Mark-up IFC Drawings, as work progresses, proving detail and information of existing and prepared Site Work including notes, elevations, sections, dimensions and details.			
B03	Cross Section Drawings	Mark-up IFC Drawings, as work progresses, proving detail and information of existing and prepared Site Work including notes, elevations, sections, dimensions and details.			
B99	Miscellaneous Arrangement Drawings	Prepare and submit new sketches as required to provide any additional information for the Site and Site preparation.			
G	G - SCHEDULES/LISTS				
G01	Bill of Materials	Bill of Materials shall show the total quantity of each work item.			
G05	Preventative Maintenance Schedule	Section shall include schedule of preventative maintenance tasks/maintenance frequencies, where relevant routine test procedures and inspection instructions are to be provided for construction equipment.			
G99	Miscellaneous Schedule/List Documents	As described in the procurement documents and on SDRL or considered necessary by Supplier.			

Lower Churchill Project	Supplier Document Requirements List (SDRL) EARTHWORK at Soldiers Pond		Revision		Page
	Nalcor Doc. No.: LCP-SN-CD-4500-CV-LS-0001-01		C2	Supplier Document Requirements List (SDRL)	-
	SLI Doc. No.: 505573-4000-40EL-0015		01	06-Nov-2013	
H	H - CALCULATIONS				
H32	Survey Calculation	Calculations shall be provided for the following, as a minimum: <ul style="list-style-type: none"> • Identification and 3D coordinates of the original site survey control points. • Identification and 3D coordinates of all major control points on the site. • Details layout drawings showing all major control points. 			
H34	Structure Stability Calculation	Calculations shall be provided for the following, as a minimum: <ul style="list-style-type: none"> • Location and size of drainage system components • Stability of excavated surfaces (soil and rock) • Stability of constructed fill slopes • Stability of natural in-situ materials and/or slopes affected by construction or reservoir impoundment, during construction or operation. 			
H37	Blasting Calculation	Calculations shall be provided for the following, as a minimum: <ul style="list-style-type: none"> • Drilling pattern and powder factor for each structure or operation, including: <ul style="list-style-type: none"> - Size and spacing of holes, and size and placement of charges, for mass excavation. • Vibration limitations for each structure or operation. 			
H99	Miscellaneous Calculations Documents	Monitoring Report for each blast			
J	J - PERFORMANCE DATA				
J10	Soil Graduation Analyses	Standard particle size distribution in table and graph formats.			
J12	List of Environmental Emission and Effluent	As per Environmental Requirements.			
J90	Asphalt Concrete Mix Design Submittal for Asphalt Paving Design, Supply and Construction	The Contractor shall submit Asphalt Concrete Mix Design - Hot Placed as per Department of Transportation and Works (DTN) Form 330.06 - End Product Specification (EPS), including Job Mix Formula (JMF), etc. for the Engineer Acceptance			
J91	Certificates of Materials for Asphalt Paving Design, Supply and Construction	The Contractor shall submit Certificates, Samples, Gradations and Charts etc. for Materials as per Department of Transportation and Works (DTW) Form 330.06 - End Product Specification (EPS) for the Engineer Acceptance			
J99	Miscellaneous Performance Data Documents	As described in the procurement documents and on SDRL or considered necessary by Vender/Supplier.			
K	K - PROCEDURES				
K24	Construction Method Statements and Procedures	Includes all necessary construction method statements and procedures.			
K99	Miscellaneous Procedures Documents	As described in the procurement documents and on SDRL or considered necessary by Vender/Supplier.			
M	M - TEST & INSPECTION REPORTS				
M26	Reports for Sample Tests	Provide sample test reports			
M90	Test Results for Asphalt Paving Construction	The Contractor shall supply test results for Construction as per Department of Transportation and Works (DTW) Form 330.06 - End Production Specification (EPS)			
M99	Miscellaneous Test & Inspection Reports	As described in the procurement documents and on SDRL or considered necessary by Vender/Supplier.			
Q	Q - QUALITY				
Q01	Quality Assurance System Registration Certificate	Certificate provided by an authorized registrar confirming conformance to a quality management system.			
Q03	Quality Plan	Document specifying which procedures and associated resources shall be applied by whom and when to a specific project, product, process or contract.			
Q04	Inspection and Test Plan(s) (Factory and Site works)	Document defining the inspection and test activities to be carried out during the realization of a product.			
Q07	Internal/External Audit Schedule	Documented audit schedule for both internal and external (supplier/sub contractor and third party) audits.			
Q10	NCR Register and associated close out reports	Register of Nonconformities reported and associated close out reports.			
Q12	Declaration of Installation and Inspection Completion	As per Quality requirements.			
Q13	Authorized Deviations	Site queries, concession requests etc. as approved by Company			
R	R - MANUALS				
R99	As-Built Drawings	Completed As-Built Drawings			

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	SLI Doc. No.: 505573-4000-40EL-0015	01	06-Nov-2013	-

Legend

DEFINITIONS / LEGEND

Column 1

- SDRL Code

Column 2

Type of Document / SDRL Title

Column 3

Provide with proposal (X)= Populated with "X" indicating if the document is required for the initial bidding process.

1E = One Electronic Copy (*)

1P = One Print Copy (*)

Column 4 / 5 / 6 / 7 Submit Prior to start of fabrication / Construction : After Shipment ; With Shipment : and or Minimum documents approved code 1 prior to Inspection release

Column 8 As built populated with "X" where required.

Column 9 Final Document location code (R01 / R02 / R05 / R99) = Populated with R01, R02, R05 or R99 as required indicating if the document is required in a manual (s).

Column 10 Final file format = Editable native files as required : SLI to define file format : Example DWG, PDF, Word, Excel...

PE = .pdf format

NE= Native Electronic Format

Column 11 / 12

Submission Requirements Include: a number refers to the number of weeks the Supplier / Contractor has to submit the document after receipt of order

ARO = After Receipt of Order

Monthly = Submissions required on a monthly basis

EXHIBIT 5

HEALTH AND SAFETY REQUIREMENTS

1.0 Introduction

Without limiting the generality and application of the Agreement, Contractor will abide by and ensure Contractor Group Personnel abides by, at a minimum, the health and safety requirements set forth herein and as described in the most recent version of the following documents located in Exhibit 11 – Company Supplied Documents:

- LCP Health and Safety Management Plan (LCP-PT-MD-0000-HS-PL-0001-01)
- LCP Security Management Plan (LCP-PT-MD-0000-HS-PL-0005-01)
- Standard for Drug and Alcohol (LCP-PT-MD-0000-LR-SD-0001-01)

2.0 Health and Safety Commitment

Contractor will demonstrate a strong commitment to health and safety management and must operate and ensure that Contractor Group operates a health and safety management system that is compliant with OSHAS 18001:2007, corresponding Canadian standards and fulfills all Applicable Laws pertaining to the Work and Worksites.

Contractor will place the highest priority on safety and health while performing the Work. Contractor is responsible for maintaining a safe working environment at all time at the Worksite whether of a temporary or permanent nature. The system in place will cater to specific requirements for instruction, supervision and resources pertaining to Contractor's Personnel, and Engineer's and Company's Personnel.

Contractor will not permit nor tolerate any unsafe or unhealthy condition or activity over which it has control. Contractor will immediately inform Engineer of any unsafe or unhealthy condition or work practice of which it becomes aware but over which it has no authority to correct.

3.0 Compliance with Health and Safety Regulations and Standards

Contractor will be responsible for complying with all Applicable Laws relating to health and safety, and for taking all necessary safety precautions related to or arising out of the performance of the Agreement in order to protect the Work, Contractor's Personnel, and Engineer's and Company's Personnel, the general public, all other persons, the property of Company, and the property of third parties.

Without prejudice to Contractor's general and legal responsibility for the safety of its operations and of the Personnel and property involved, where Engineer has notified Contractor of any specific health, safety or environmental requirements, which are applicable to any part of the Work being performed, Contractor will comply therewith.

4.0 General Requirements

Without limitation to the full implementation of Contractor's health and safety management system for the Work, Contractor will:

- a) Be responsible for maintaining and enhancing the health and safety awareness of Contractor's Personnel. Contractor will arrange and participate in regular meetings with Contractor's Personnel and Engineer to review implementation of the systems and processes required for Contractor to meet its health and safety obligations in the execution of the Work;
- b) Identify all high risk activities and cease work in any identified areas until adequate and effective controls are implemented;
- c) Require all Contractor's Personnel to wear personal protective equipment (PPE) and clothing suitable for existing Work in compliance with the Applicable Laws in the locations the Work is being performed. Canadian Safety Association (CSA) standards for PPE will apply to Work performed in Canada;
- d) Provide specific instruction to Contractor Group on their responsibilities for safe work during normal and emergency operations, including explanation of recognized hazards and associated protective measures, procedures and emergency response measures;
- e) Ensure that each of Contractor's Personnel, regardless of prior experience, demonstrates competency to Engineer in his/her job. The Contractor Group's supervisory Personnel will observe new Personnel's work performance until Engineer is satisfied that such Personnel are competent to fill the position in a safe and effective manner;
- f) Ensure that all Contractor's equipment, facilities, materials and Contractor's Items are maintained in safe, sound and proper condition, meet all applicable industry standards and Applicable Laws and are capable of performing the function intended;
- g) Conduct thorough drills, desktop exercises and tests of Contractor's Items, Personnel and procedures. The Contractor will ensure the effectiveness, suitability and adequacy of the emergency response and preparedness program;
- h) Document and instruct Personnel on work procedures, safe practices, Contractor's safety rules and standards, emergency plans and duties, and Applicable Laws;
- i) Conduct scheduled and impromptu safety meetings of all Personnel performing the Work, including any Contractor's Personnel, in which the possible hazards, problems of the job, and related safe practices are emphasized and discussed;
- j) Practice good housekeeping standards;
- k) Provide general safety education through training, safety meetings, Company and Engineer publications and other educational media;
- l) Establish and support a health and safety committee in accordance with Applicable Laws;
- m) Provide all reasonable means to control and prevent fires and explosions, injury to Personnel and damage to equipment and property;
- n) Institute a permit to work system for hot and cold work, for all Work involving welding, energized equipment, cutting and burning, open flame, electric tools, grinding and soldering which is conducted outside a designated safe area. Contractor will ensure that gas bottles for cutting and burning are stored, separated and capped in accordance with Applicable Laws;

- o) Institute a confined space entry procedure and provide training for Personnel involved in confined space entry;
- p) Institute a lock out - tag out procedure for all work on equipment, which may inadvertently operate during installation, repair or maintenance, all in accordance with Contractor's permit to work system;
- q) Institute a pre-work inspection program prior to commencement of Work. Contractor will inspect and perform task analysis to ascertain whether any health or safety hazards exist. Contractor will correct identified hazards before commencement of Work or will take steps to prevent exposure of Personnel to the hazard. Contractor will document this inspection and hazard analysis process and maintain a copy of the document on file;
- r) Institute a program to ensure Contractor's Personnel are fully trained and currently qualified for their jobs in accordance with regulatory and industry standards and all Applicable Laws, and as otherwise specified in this Agreement. Records of certification and training will be maintained for each of Contractor's Personnel;
- s) Maintain a register of all lifting equipment. All lifting and rigging equipment will be load tested as per manufacturer's recommendations and be fully certified with suitable inspection procedures in place. All Personnel involved in lifting and rigging activities will be suitably trained and certified. All lifting and rigging equipment must be inspected annually by a certified inspection company and certificate issued and maintained on site.
- t) Operate and use all pressure vessels in accordance with local safety requirements and Applicable Laws;
- u) Maintain a current inventory of hazardous materials and ensure compliance with Applicable Laws pertaining to their transportation, storage, use, handling and disposal;
- v) Ensure compliance with current occupational exposure limits for physical, chemical, or biological agents or materials, in accordance with Applicable Laws;
- w) Implement and maintain a planned maintenance system for its tools, equipment, machinery and electrical systems for Contractor's Personnel;
- x) Provide Engineer with the results of any health and safety visits, audits, inspections, investigations, surveys, tests or measurements, associated with the Work, conducted by an Authority;
- y) Provide signage, as appropriate, to warn Personnel of hazards and indicate areas where the use of additional personal protective equipment is required;
- z) Provide and maintain proper barriers, safe access and egress, guards, rails and safety devices to minimize hazards during the performance of Work;
- aa) Ensure all inboard and over-the-side scaffolding and work platforms are installed, tested and certified by competent Personnel, prior to use;
- bb) Perform planned health and safety audits and inspections of the Worksites, work practices and HS management system in accordance with the audit and inspection schedule outlined in the Contractor's Health and Safety Plan (as described in Section 5 of this Exhibit 5);

- cc) Conduct a risk assessment of its operations and provide Engineer with a copy of the assessment, outlining measures to be taken and schedule for implementation of those measures required to address identified hazards. The risk assessment will include consideration of health and safety risks;
- dd) Ensure that all Personnel engaged in the Work are medically fit and maintain high standards of hygiene;
- ee) Ensure that all firefighting equipment is maintained and operational in accordance with CSA standards and firefighting Personnel are well trained and competent in firefighting;
- ff) Set out a communications scheme identifying lines of reporting and method of reporting, both within the Contractor's own organization and to Engineer;
- gg) Not cause, permit, or tolerate a hazardous, unsafe, unhealthy condition or activity over which it has control, to exist or be conducted in a Worksite; and
- hh) Prior to providing access to a Worksite, provide all Personnel with a Worksite orientation which will include:
 - i. Worker's rights;
 - ii. Contractor health and safety policy;
 - iii. Contractor environmental policy;
 - iv. Safe work practices and procedures;
 - v. Reporting of incidents and accidents;
 - vi. Emergency response;
 - vii. Personal protective equipment;
 - viii. Risk assessment; and
 - ix. Hazard identification.

5.0 Contractor's Health and Safety Plan

Within fourteen (14) days of the Effective Date or within the time specified in Exhibit 4 – Supplier Document Requirements List, the more stringent of the two, Contractor shall submit to Engineer for Approval, a Health and Safety Plan for the Work. Contractor's Health and Safety Plan will be based upon the Contractor's health and safety management system and will address all requirements stated in this Exhibit 5.

Engineer will review Contractor's Health and Safety Plan and may provide written comments to Contractor. Contractor will review Engineer's comments, make the necessary changes and reissue it for Engineer's Approval. Contractor will present all changes to its Health and Safety Plan to Engineer for Approval.

As a minimum, the following information will be included in the Contractor's Health and Safety Plan:

- a) Communication of safety expectations to Contractor Group;
- b) Identification of the strategic initiatives that Contractor will utilize during the Work to achieve an injury and illness free workplace;
- c) A verification/audit program to verify that the Health and Safety Plan has been implemented for the Work;

- d) An LCP level safety organization chart;
- e) Line functions with specific safety responsibilities;
- f) High level, Work specific roles and responsibilities for Contractor's Personnel, including accountabilities and qualifications;
- g) Interface roles and responsibilities between Contractor and all other members of Contractor Group by use of responsibility-assignment matrices;
- h) Description of how Contractor's management team will actively participate in health and safety management activities;
- i) Subcontractor selection and management;
- j) Be structured in accordance with the various elements associated with the Work such as fabrication, transportation, installation and commissioning;
- k) Identification of Contractor's resources (Personnel, Contractor's Items, facilities, equipment, consumables, or other requirements) required to support health and safety management;
- l) A description of the system in place to ensure that the safety integrity of equipment and systems involved is maintained throughout the Work;
- m) Identification of procedures applicable to individual activities comprising the Work, including chemical handling procedures and permits to work;
- n) Identification of training and qualification requirements pertaining to Personnel involved in the Work, including all location specific training;
- o) Outline of a process for maintaining a hazard register, which identifies significant hazards to the safety and health of all Personnel, the safety of the environment and the safety of the technical assets. The register will include a cross reference to the operating procedures in place to control the risk arising from individual hazards;
- p) Identification of interfaces to Company's and Engineer's health and safety management systems in line with the Work;
- q) An emergency response preparedness plan in line with Contractor's scope of the Work and which interfaces with Company's and Engineer's emergency response plan;
- r) Processes that will be utilized by Contractor during the Work to eliminate or control identified hazards;
- s) Any other elements as identified in Company's and Engineer's health and safety standards;
- t) Identification of how Contractor will capture learning and best practice during the Work execution;
- u) Inclusion of a measureable health and safety targets for both leading and lagging indicators that are in line with Company's targets. Performance measuring will include lost time injury frequency rate, all-injury frequency rate, and severity rate; and
- v) Identification of how Contractor will measure, assimilate, and report health and safety performance to Engineer.

Contractor's Health and Safety Plan shall:

- take into consideration the hazards and risks that all of Contractor's Personnel are exposed to while working at the Site;
- be communicated to Contractor's Personnel prior to the commencement of Work at the Site; and
- meet all Applicable Laws.

Contractor shall comply with its Health and Safety Plan.

Contractor is responsible for implementing, resourcing, and periodically verifying its Health and Safety Plan. Contractor will provide Engineer with an implementation schedule for its Health and Safety Plan, along with an update to the Health and Safety Plan on a quarterly basis.

Contractor will participate in a health and safety management system interface process and will be in a position to demonstrate through a gap analysis that Contractor's Health and Safety Plan complies with the requirement outlined herein and the most recent version of the following documents as amended from time to time:

- LCP Health and Safety Management Plan (LCP-PT-MD-0000-HS-PL-0001-01)
- LCP Security Management Plan (LCP-PT-MD-0000-HS-PL-0005-01)
- Standard for Drug and Alcohol (LCP-PT-MD-0000-LR-SD-0001-01)

Any deficiencies identified as a result of the gap analysis will be corrected by Contractor unless otherwise agreed in writing with Engineer. Contractor acknowledges that it fully understands all interfaces between Contractor's Health and Safety Plan and Company's and Engineer's health and safety standards.

6.0 Engineer's Review of Contractor's Health and Safety Plan

Without relieving Contractor of its responsibilities under the Agreement, Contractor will allow Engineer access to facilities, Personnel and records, when requested, to enable Company to:

- a) ensure that Contractor is carrying out its health and safety responsibilities under this Agreement;
- b) ensure that Contractor is carrying out its responsibilities outlined in its Health and Safety Plan; and
- c) conduct, if required, independent investigation into any health, safety or environmental incident arising in the performance of the Agreement.

The forgoing will also be applicable to all other members of Contractor Group.

If Engineer is made aware of a failure of Contractor to comply with its responsibilities under this Agreement, which does not create an imminently unsafe condition, Engineer will have the right to notify Contractor of such failure and to direct Contractor to abate such condition as soon as possible. If Contractor fails to comply within a reasonable period, then Engineer will have the right to stop all Work being performed by Contractor

and the Work will not be restarted until Contractor has abated the failure to comply. Contractor shall not be entitled to compensation for any costs it incurs as a result of such Work stoppage.

7.0 Contractor's Health and Safety Personnel

Contractor shall provide full time, designated health and safety advisor(s) who will be responsible for attending safety meetings, conducting incident investigations, providing health and safety support to all Personnel engaged in the Work and the implementation, maintenance and monitoring safety guidelines and procedures. Contractor will ensure that the safety advisor is a Certified Registered Safety Professional or has equivalent training and experience.

Contractor will require Engineer's Approval of all health and safety Personnel that are proposed to be based at the Worksites.

8.0 Drug and Alcohol Policy

The use, possession, distribution or sale of alcohol, illegal drugs or drug-related paraphernalia, firearms, explosives, weapons or other dangerous substances or articles is not permitted at the Site.

Contractor will submit to Engineer, for Engineer's Approval, Contractor's drug and alcohol policy, which will be in accordance with Applicable Laws. Contractor will ensure that Contractor's Personnel, engaged in the Work at the Site, comply with Company's drug and alcohol policy, Standard for Drug and Alcohol (LCP-PT-MD-0000-LR-SD-0001-01).

Engineer may, if it has reasonable cause to believe that any of Contractor's Personnel is under the influence of alcohol or drugs, require such Personnel be tested in accordance with Company's Standard for Drug and Alcohol (LCP-PT-MD-0000-LR-SD-0001-01) or require Personnel to be removed from the Site and denied further access.

9.0 Reporting

Contractor will provide immediate notification in writing to Engineer of all incidents, including lost time injuries, restricted work cases, medical aids, property damages and near misses. Contractor will immediately complete an investigation into the incident. Incident investigation reports will be submitted to Engineer within seven (7) Business Days after the incident. Contractor's incident investigation report will verify that the incident has been fully investigated and that the root cause and contributing factors have been identified and communicated to the appropriate Personnel. Contractor will also provide Engineer with copies of all reports or other documents filed or provided by Contractor's insurers and Authorities in connection with such incidents.

Contractor will provide Engineer with a monthly safety performance report, which at a minimum, will include all of the following:

- a) Lost time Injuries
- b) Restricted work cases
- c) Medical aids
- d) First aids
- e) Occupational illness
- f) Property damage
- g) Recordable injuries
- h) Near miss incidents

Contractor will classify all incidents in accordance with the Canadian Electrical Association (CEA) Standard A-2-2007. In general terms, the following is the classification scheme for all injury types:

- a) Lost time injury is defined as a work related injury for which an employee requires medical attention and is unable to return to work for his/her next scheduled shift.
- b) Medical treatment injury is defined as a work related injury for which an employee requires medical attention; however, s/he is able to return to work for the next scheduled shift.
- c) First aid injury is defined as a work related injury, which is minor in nature and can be treated at the Worksite.

The general decision-making process for injury classification typically consists of the following five (5) steps:

- a) Determine whether a case occurred; that is, whether there was a death, illness, or an injury;
- b) Establish that the case was work related or resulted from an event or exposure in the work environment;
- c) Decide whether the case is an injury or an illness;
- d) If the case is an illness, record it;
- e) If the case is an injury, decide if it is recordable based on a finding of medical treatment, loss of consciousness, restriction of work or motion or transfer to another job.

Injury and illness will be classified in accordance to CEA Standard A-2-2007. Generally, a recordable injury is any occupational injury or illness that results in an individual experiencing:

- a) fatality;
- b) lost time injury;
- c) medical treatment injury; or
- d) Other injury/illness (not captured above), which has restricted work; or significant occupational injury/illness; or loss of consciousness.

Each injury or illness should be recorded only once and categorized using the above hierarchy. To illustrate, a lost time injury that involves medical treatment injury and subsequent restricted work will be categorized as a lost time injury.

For work-related injury/illness where the signs and symptoms recur or continue in the absence of an exposure to the workplace, the incident is recurred and does not precipitate a new incident.

EXHIBIT 6

ENVIRONMENTAL AND REGULATORY COMPLIANCE REQUIREMENTS

1 INTRODUCTION

This Exhibit 6 - Environmental and Regulatory Compliance Requirements specifies the Contractor's responsibilities with respect to compliance with Applicable Laws during construction activities at the LCP.

1. The Contractor shall demonstrate a strong commitment to environmental management and must operate, and ensure that all members of the Contractor Group operate in accordance with Canadian standards and fulfill all Applicable Laws, including regulatory requirements, pertaining to the Work and Worksites.
2. The Contractor shall place high priority on environmental protection while performing Work and is responsible for maintaining an environmentally compliant Worksite at all times whether the Work is temporary or permanent.
3. The Contractor shall not cause, permit nor tolerate an environmentally non-compliant condition or activity over which it has control. The Contractor shall immediately inform the Engineer of any environmentally non-compliant condition or work practice of which it becomes aware but over which it has no authority to correct.

2 CONTRACTOR'S RESPONSIBILITIES - REGULATORY AGENCIES

2.1 General

1. The Contractor shall ensure Work areas are available for inspection by the Authorities. All inspections, other than by the Engineer or Company Representative, will be arranged in advance through the Engineer.
2. Any violations of environmental permits or authorizations, or any environmental related incidents observed by inspectors representing Authorities, are to be reported to the Engineer prior to leaving the Site. Except in emergencies, environmental protection measures required by Authorities shall be subject to the Acceptance of Engineer prior to implementation.
3. The Contractor shall ensure that Contractor's Personnel, including machinery and equipment operators and truckers, comply with (a) the terms and conditions of the Agreement, (b) all environmental Applicable Laws and applicable permits, (c) requirements of Authorities, and (d) such other rules and regulations as the Engineer may establish and notify the Contractor.
4. Contractor shall ensure that all members of the Contractor Group shall not harass wildlife or waterfowl or unduly disturb fish. Hunting and fishing are not permitted on the Site. Any contravention of environmental requirements, including employee actions accidental or otherwise, resulting in environmental damage shall be reported to the Engineer without delay.

5. In accordance with the Agreement, the Contractor shall be responsible for customs clearance, import permits, Work validations, Work permits and operating licenses in the port of mobilization / demobilization of the Work, and other requirements that are essential to the Work during all phases of the Work.

2.2 Permits

1. The Contractor shall review the Work to identify all permits, authorizations and certificates that are required for all the Contractor's facilities and the Work. Within the time specified in Section 3.1 below, Contractor shall provide to the Engineer a permit list (containing all such identified permits, authorizations, and certificates), to be entered into a permit registry on Aconex. Once entered, the Engineer shall have the authority to assign to either the Contractor or the Engineer the responsibility for preparing the permit applications.
2. Appendix A - List of Permits, Acceptances and Authorizations provides a list of permits that may be required to undertake the Work and typical responsibility for completing permit applications. This is a preliminary list and the Contractor shall complete its own list and submit it to the Engineer for Acceptance. In addition, the responsibility outlined on this list may be changed by written instructions from the Engineer to the Contractor due to changes in the Work or schedule constraints.
3. For those permits identified as the responsibility of the Contractor, the Contractor shall identify and prepare applications for all authorizations, permits, dispensations, consents and licenses required by Applicable Laws to enable it to perform the Work. All permit applications identified as the responsibility of the Contractor shall be submitted to the Engineer for internal review a minimum of 3 weeks prior to the date that such authorization, permit, dispensation, consent or license is submitted to the Authority. The Engineer will then submit the permit to the applicable Authority, on behalf of the Contractor. The Engineer will obtain the permit, and forward a copy to the Contractor immediately upon receipt and before the Contractor's facilities are used or the Work is undertaken. The Contractor shall ensure that it receives a copy of the permit and complies with the permit conditions.
4. For those permits identified as the responsibility of the Engineer, the Contractor shall provide information as required in a timely manner to complete the relevant applications. The Contractor shall ensure that permits designated as the responsibility of the Engineer that are required for the Work are in place prior to starting the Work.
5. It should be noted that some authorizations associated with the LCPare subject to an aboriginal consultation process. This process requires that permit applications are provided to relevant aboriginal organizations by the associated Authority for a period of at least 30 days.
6. The Contractor shall take into consideration all these additional reviews and approvals, and

the associated timelines, and ensure applications are prepared with the incorporation of these timelines.

7. For permits already in place for existing facilities and permits that the Contractor holds to carry out its business and daily activities, the Contractor must provide a copy of these permits to the Engineer prior to the start of the Work.
8. The *Storage and Handling of Gasoline and Associated Products Regulations, 2003* (referred to as the “GAP Regulations”) under the *Environmental Protection Act* of Newfoundland and Labrador applies to the construction, operation and registration of “storage tank systems”¹ in the Province of Newfoundland and Labrador. While Section 3 of the GAP Regulations explicitly exempts storage tank systems of capacity of 2500 litres or less that are connected to a heating appliance (e.g. tanks controlled by the *Heating Oil Storage Tank System Regulations, 2003* of Newfoundland and Labrador), all other “stationary” tanks (i.e. tanks installed in a fixed location) may be interpreted as falling under the control of these regulations. Following this strict interpretation, even very small tanks (e.g. less than 5 litre tanks connected to small generators, water pumps, etc. installed in temporary locations) may fall under control of the GAP Regulations.

Contractor shall provide Notice to Engineer of any and all storage tanks, storage tank systems and equipment storage tanks proposed by Contractor for use on the Site at least one (1) week prior to such use, along with all information pertaining to such tanks and systems as required by Engineer . If requested by Engineer, Contractor shall obtain written dispensation from the application of the GAP Regulations from the applicable Authority prior to such use of tanks or systems that are not already registered under GAP Regulations. Any required tank or system registration must be accompanied by any necessary regulatory variances.

In general, the GAP Regulations apply to all stationary storage tanks and storage tank systems except in the following cases:

- Tanks with capacities of 2,500 liters or less that are connected to a heating appliance;
- Tanks that are designed, constructed and utilized in the inherent operation of a piece of equipment. In this case, the tanks must be physically secured and dedicated to the equipment requiring the fuel for its operation; and
- "Mobile" tanks (e.g. tank trucks and tank truck trailers) used for temporary, stationary storage. In this case, storage period must not exceed 14 days and no additional fuel can be added to the tank. There must also be a minimum of 14 days of downtime between separate storage periods and there can be no more than two 14-day storage periods within a 12 month time frame.

¹ The GAP Regulations defines “storage tank system” as an “... atmospheric or low pressure closed tank container and all vents, fill and withdrawal piping associated with it installed in a fixed location and includes temporary arrangement on cradles and skids”.

Note that all provisions of the GAP Regulations, including registration, apply for all tanks associated with mobile generators.

Notwithstanding the above provisions of this Section 2.2.8, Contractor shall be solely responsible to comply with all Applicable Laws relating to the Work, and nothing in this Section 2.2.8 shall be construed so as to restrict, limit, waive or otherwise diminish Contractor's responsibility and liability to comply with all such Applicable Laws.

3 CONTRACT-SPECIFIC ENVIRONMENTAL PROTECTION PLAN (C-SEPP)

1. Within two (2) weeks after the Effective Date, the Contractor shall submit to the Engineer for Acceptance, a Contract Specific Environmental Protection Plan (C-SEPP) for the Work using the C-SEPP template provided in the Agreement. No Site Work shall take place until the Engineer has Accepted the C-SEPP.
2. The Contractor's C-SEPP shall be based upon the *General Environmental Requirements* of the Technical Specification of this Agreement (if applicable), the Project Wide Environmental Protection Plan (in Exhibit 11 - Company Supplied Documents), and the Contractor's own corporate environmental management system.
3. The C-SEPP is prepared by the Contractor and is specific to the Work. The C-SEPP provides a practical way for the Contractor to demonstrate its understanding of environmental regulations, practices and procedures required to reduce, or eliminate, potential negative environmental effects.
4. The Contractor's C-SEPP shall include the following, at a minimum (refer to the C-SEPP template for all requirements):
 - a description of the construction sequence (e.g. GANTT Chart);
 - roles and responsibilities;
 - mitigation procedures for all areas of environmental concern;
 - procedures for environmental monitoring;
 - maintenance requirements for environmental control structures;
 - procedures for post-activity clean-up and demolition; and
 - contingency planning for environmental concerns.
5. The Contractor's C-SEPP shall also include any permits, registrations or notifications, required by Federal, Provincial, or aboriginal stakeholders for the proposed activities. The Contractor may be required to prepare additional environmental documentation prior to any fieldwork for non-time critical activities.
6. The Contractor is responsible for implementing, resourcing, and periodically verifying the C-SEPP. Contractor shall provide Engineer with an implementation schedule for the plan and with an update provided on a quarterly basis.

4 REPORTING

1. The Contractor shall conduct daily inspections of the Work to confirm environmental compliance. The inspections shall be documented by the Contractor in daily reports which shall be kept on file. Any non-compliance and corrective actions shall be documented by the Contractor.
2. The Contractor shall immediately notify the Engineer of all environmental incidents, including any loss of hazardous or controlled products. **Any spill meeting the following criteria shall be reported immediately to the Canadian Coast Guard at 709-772-2083 or 1-800-563-9089:**
 - a. Any spill on a natural water body (marine or freshwater), or
 - b. Any land-based spill:
 - i. that is over 70 litres, or
 - ii. of any quantity that has the potential (e.g. by migrating through subsurface soils/bedrock/substructures², etc) to enter a natural water body, or
 - iii. of any quantity that has the potential to impact a privately owned property.
3. Once the spill is reported to the Canadian Coast Guard, the Engineer will liaise with other Authorities to provide additional information, as required.
4. The Contractor shall provide the Engineer with a monthly environmental performance report for the Work. The monthly cut-off for each report shall be the close of business day up to and including the final day of each calendar month. The Contractor's environmental performance report shall include, without limitation, the following:
 - i. Hazardous and other waste generated during the period;
 - ii. Environmental incidents, including loss of fuel or other hazardous products; and
 - iii. Reported non-compliance and associated corrective actions.
5. The Contractor shall complete and submit to the Engineer a Monthly Fuel Consumption Report, in the form as set out in Appendix C - Monthly Fuel Consumption Report, no later than 7 days after the end of each calendar month.

² sewer systems, conduits, tunnels, etc

APPENDIX A

LIST OF PERMITS, ACCEPTANCES AND AUTHORIZATIONS

	Permit	Regulatory Body	Act	Responsibility for Completing Permit Applications
1	Application for Crown lands	DOEC	<i>Lands Act</i> of Newfoundland and Labrador	Engineer
2	Notice of Intent for Reservation of Shoreline	DOEC	<i>Lands Act</i> of Newfoundland and Labrador	Engineer
3	Application for Water and Sewerage Works Permit	DOEC	<i>Water Resources Act</i> of Newfoundland and Labrador, Sections 36, 37 and 48	Contractor
4	Permit to Alter a Body of Water and Schedule A (Culverts)	DOEC	<i>Water Resources Act</i> of Newfoundland and Labrador, Section 48	Engineer
5	Permit to Alter a Body of Water and Schedule B (Bridges)	DOEC	<i>Water Resources Act</i> of Newfoundland and Labrador, Section 48	Engineer
6	Permit to Alter a Body of Water and Schedule C (Dams)	DOEC	<i>Water Resources Act</i> of Newfoundland and Labrador, Section 48	Engineer
7	Permit to Alter a Body of Water and Schedule D (Fording)	DOEC	<i>Water Resources Act</i> of Newfoundland and Labrador, Section 48	Engineer
8	Permit to Alter a Body of Water and Schedule E (Pipe Crossing - Water Intake)	DOEC	<i>Water Resources Act</i> of Newfoundland and Labrador, Section 48	Engineer
9	Permit to Alter a Body of Water and Schedule F (Stream Modifications)	DOEC	<i>Water Resources Act</i> of Newfoundland and Labrador, Section 48	Engineer
10	Permit to Alter a Body of Water and Schedule G (Small Bridges)	DOEC	<i>Water Resources Act</i> of Newfoundland and Labrador, Section 48	Engineer

	Permit	Regulatory Body	Act	Responsibility for Completing Permit Applications
11	Permit to Alter a Body of Water and Schedule H (Other Alterations)	DOEC	<i>Water Resources Act of Newfoundland and Labrador, Section 48</i>	Engineer
12	Application for Permit for Drilling a Non-Domestic Well	DOEC	<i>Water Resources Act of Newfoundland and Labrador, Section 58</i>	Engineer
13	Application for Water use License	DOEC	<i>Water Resources Act of Newfoundland and Labrador, Section 48</i>	Engineer
14	GAP Registration	DGS and DOEC	<i>Environmental Protection Act of Newfoundland and Labrador</i>	Contractor
15	Diesel Generator Registration Form	DGS	<i>Environmental Protection Act of Newfoundland and Labrador</i>	Contractor
16	Permit for Access of any Highway	DGS	<i>Urban and Rural Planning Act, 2000 of Newfoundland and Labrador</i> <i>Works, Services and Transportation Act of Newfoundland and Labrador</i>	Engineer
17	Highway Services Signs Application	DTW	<i>Urban and Rural Planning Act, 2000 of Newfoundland and Labrador, subsections 36(2) and 39(2)</i>	Contractor

	Permit	Regulatory Body	Act	Responsibility for Completing Permit Applications
18	Asphalt Plant Construction and Operation Form	DGS	<i>Environmental Protection Act of Newfoundland and Labrador</i>	Contractor
19	Building Accessibility Design Registration / Exemption Registration	DGS	<i>Buildings Accessibility Act of Newfoundland and Labrador</i>	Engineer
20	Fire and Life Safety Review Plan (National Building Code)	DMA	<i>Buildings Accessibility Act of Newfoundland and Labrador</i>	Engineer
21	Used Oil Storage Tank System Application	DOEC	<i>Environmental Protection Act of Newfoundland and Labrador</i>	Contractor
22	Mobile Fuel Storage Tank Relocation	DGS	<i>Environmental Protection Act of Newfoundland and Labrador</i>	Contractor
23	Design Registration of Pressure Piping System	DGS	<i>Public Safety Act of Newfoundland and Labrador</i>	Engineer
24	Elevating Devices	DGS	<i>Public Safety Act of Newfoundland and Labrador</i>	Engineer
25	Food Establishment License Temporary Facility	DGS	<i>Food and Drug Act of Newfoundland and Labrador</i>	Contractor
26	Septic Systems less than 4,546 L/day flow	DGS	<i>Water Resources Act of Newfoundland and Labrador</i>	Contractor
27	Commercial Cutting / Operating Permit	DNR	<i>Forestry Act of Newfoundland and Labrador</i>	Engineer
28	Permit to Burn	DNR	<i>Forestry Act of Newfoundland and Labrador</i>	Engineer

	Permit	Regulatory Body	Act	Responsibility for Completing Permit Applications
29	Application for a Quarry Permit	DNR	<i>Quarry Materials Act, 1998</i> of Newfoundland and Labrador	Engineer
30	Application for a Subordinate Quarry Permit	DNR	<i>Quarry Materials Act, 1998</i> of Newfoundland and Labrador	Engineer
31	Permit to Destroy Problem Animals	DNR	<i>Wildlife Act</i> of Newfoundland and Labrador	Engineer
32	Archaeological Investigation Permit	DTCR	<i>Historic Resources Act</i> of Newfoundland and Labrador	Engineer
33	Operational Statement - Notification Form - Temporary Stream Crossing	DFO	<i>Fisheries Act</i> of Canada, Section 35(1)	Engineer
34	Operational Statement - Notification Form - Clear Span Bridges	DFO	<i>Fisheries Act</i> of Canada, Section 35(1)	Engineer
35	Operational Statement - Notification Form - High Pressure Directional Drilling	DFO	<i>Fisheries Act</i> of Canada, Section 35(1)	Engineer
36	Operational Statement - Notification Form - Overhead Line Construction	DFO	<i>Fisheries Act</i> of Canada, Section 35(1)	Engineer
37	Operational Statement - Notification Form - Punch and Bore Crossing	DFO	<i>Fisheries Act</i> of Canada, Section 35(1)	Engineer

	Permit	Regulatory Body	Act	Responsibility for Completing Permit Applications
38	Operational Statement - Notification Form - Under Water Cables	DFO	<i>Fisheries Act of Canada, Section 35(1)</i>	Engineer
39	Application for Authorization for Works or Undertakings Affecting Fish Habitat - Assessment of Freshwater HADD	DFO	<i>Fisheries Act of Canada, Section 35(2)</i>	Engineer
40	Request for Project Review	DFO	<i>Fisheries Act of Canada, Section 35(1)</i>	Engineer
41	Application for License to Install and Operate a Radio Station in Canada	IC	<i>Radiocommunication Act of Canada</i>	Engineer
42	Acceptance to Dispose Waste in Municipal Landfill	DGS and Municipality (Town of Happy Valley Goose Bay)	<i>Municipalities Act, 1999 of Newfoundland and Labrador</i>	Contractor
43	Municipal Development Plan	DMA	<i>Municipalities Act, 1999 of Newfoundland and Labrador</i>	Engineer
44	Explosives User Magazine Licence (Type U)	NRCAN	<i>Explosives Act of Canada</i>	Contractor
45	Type A (Annual) Import Permit (to transport explosives)	NRCAN	<i>Explosives Act of Canada</i>	Contractor
46	Nav Canada Land Use Division Review	Nav Canada	<i>Aeronautics Act of Canada</i>	Engineer
47	Aeronautical Obstruction Clearance Form	TC	<i>Aeronautics Act of Canada</i>	Engineer

	Permit	Regulatory Body	Act	Responsibility for Completing Permit Applications
48	Navigable Waters Protection Act (NWPA)	TC	<i>Navigable Waters Protection Act of Canada, Section 4</i>	Engineer
49	Permit to Transport Dangerous Goods	TC	<i>Transportation of Dangerous Goods Act, 1992 of Canada, Section 3</i>	Contractor

APPENDIX B

ABBREVIATIONS AND ACRONYMS

Abbreviations	Description
C-SEPP	Contract-Specific Environmental Protection Plan
DFO	Department of Fisheries and Oceans (Canada)
DGS	Department of Government Services (Service NL) (Newfoundland and Labrador)
DOEC	Department of Environment and Conservation (Newfoundland and Labrador)
DNR	Department of Natural Resources (Newfoundland and Labrador)
DMA	Department of Municipal Affairs (Newfoundland and Labrador)
DTCR	Department of Tourism, Culture and Recreation (Newfoundland and Labrador)
DTW	Department of Transportation and Works (Newfoundland and Labrador)
GAP Regulations	<i>Storage and Handling of Gasoline and Associated Products Regulations, 2003</i> of Newfoundland and Labrador.
IC	Industry Canada
NRCAN	Natural Resources Canada
NWSA	<i>Navigable Waters Protection Act</i> of Canada
P-WEPP	Project-Wide Environmental Protection Plan
TC	Transport Canada

APPENDIX C

MONTHLY FUEL CONSUMPTION REPORT

MONTHLY FUEL CONSUMPTION REPORT¹		
Contractor's Name:		
Report completed by (please print):		
Signature:		
Reporting month/year (mm/yyyy):		
Report date (dd/mm/yyyy):		
Agreement Number:		
Agreement Name:		
Consumed Fuel		
Fuel Type	unit	quantity
Diesel	litres	
Gasoline	litres	
Heating oil	litres	
Propane	litres	
aviation turbo fuel	litres	
kerosene	litres	
Other (specify type)		
1	litres	
2	litres	
3	litres	
4	litres	
5	litres	
6	litres	
Total		
<p>Notes:</p> <p>1 To be completed by Contractor and submitted to the Engineer for each calendar month, no later than 7 days after end of each month.</p> <p>2 Consumed fuel to be reported is defined as:</p> <ul style="list-style-type: none"> a) quantity of fuel transferred during the reporting month to tanks of all LCP-dedicated vehicles, equipment, and facilities, or b) quantity of fuel used in the reporting month as part of a process (such as ANFO used for explosives); or c) quantity of fuel delivered to bulk storage tanks at Company's Laydown Area within the reporting month by the Fuel Delivery Services Contractor. <p>3 Contractor shall provide as part of the Monthly Fuel Consumption Report a general listing of all types of equipment, facilities, and processes that have burned fuel during the reporting month. The types of equipment, facilities, and processes include, but are not limited to, the following: heavy equipment (e.g. excavators, bull dozers, concrete trucks, etc); light equipment and vehicles (e.g. pick-up trucks, chain saws, pumps); facilities (e.g. diesel generators, concrete production, etc); processes (e.g. explosives in ANFO, etc); etc.</p>		
page 1 of 2		

EXHIBIT 7

QUALITY REQUIREMENTS

1.0 INTRODUCTION

Without limiting the generality and application of the Agreement, Contractor will abide by and ensure Contractor Group abides with the quality requirements set forth in this Agreement.

2.0 QUALITY OBJECTIVES

The following quality objectives are required of Contractor:

- a) Work will comply with the quality requirements of the Agreement;
- b) Quality management systems of Contractor Group will ensure early and proactive identification of process or product failure so as to prevent problems before they occur or minimize rework, cost and schedule impacts, and to identify potential failures, opportunities for improvement and best practices;
- c) Equipment and materials procured and/or installed by Contractor Group will be consistent with Exhibit 1 – Scope of Work;
- d) Construction Work will be carried out in accordance with established construction standards and methods;
- e) Completion activities will be executed in accordance with the procedures and manuals covering those activities; and
- f) Documentation of objective evidence of conformance to the requirements will be maintained and recorded during the execution of the Work.

3.0 DEFINITIONS, TERMS AND ABBREVIATIONS

ISO 9001:2008	Quality Management Systems – Requirements
ISO 9000:2005	Quality Management Systems – Fundamentals and Vocabulary
ISO 10006: 2003	Quality Management Systems – Guidelines for Quality Management in Projects
ITP	Inspection and Test Plan
NCR	Nonconformity Report
PMI	Positive Material Identification
QA/QC	Quality Assurance/Quality Control
QMS	Quality Management System
QP	Quality Plan
SDRL	Exhibit 4 - Supplier Document Requirements List

4.0 CONTRACTOR'S RESPONSIBILITIES

- a) Contractor shall comply with and ensure that Contractor Group complies with requirements outlined in this Exhibit 7.
- b) The Contractor shall ensure that Contractor Group implements the quality activities described in this Exhibit 7.
- c) Contractor shall demonstrate the implementation of its quality program and the compliance of its Work with the requirements of the Agreement.

- d) In accordance with the Articles of the Agreement, Contractor shall provide the right of access to Company Group Personnel, to the Worksites to monitor the progress of the Work.
- e) Contractor shall provide acceptable office accommodation, including internet connections for the Engineer's inspectors and expeditors. The level of involvement of inspectors and expeditors shall be determined by Engineer.
- f) Contractor shall ensure that documents requiring a registered professional engineer's seal and signature shall be in accordance with the *Engineers and Geoscientists Act, 2008* of Newfoundland and Labrador and the by-laws of the Professional Engineers and Geoscientists – Newfoundland and Labrador (refer to www.pegnl.ca).

5.0 QUALITY MANAGEMENT SYSTEM

Contractor shall have an effectively implemented and maintained QMS for the execution of the Work. The QMS shall, at a minimum, be formally documented and compliant with the requirements of ISO 9001:2008. The QMS shall emphasize building quality into the Work through the use of documented control processes that incorporate activities necessary to assure quality.

The QMS shall be supported by an established quality organization with qualified resources, and formally documented control procedures to effectively administer and implement the requirements.

Prior to subcontracting any Work, Contractor shall demonstrate to Engineer that the selected Person has a quality management system that complies with the provisions of ISO 9001:2008. Contractor shall not Subcontract any part of the Work to a Person that does not meet the standards established by the ISO 9001:2008. These requirements also apply to Work to be performed by Subcontractors' subcontractors of every tier.

6.0 QUALITY ORGANIZATION

Contractor shall appoint a quality representative, empowered by management with freedom and authority to:

- a) oversee the management of quality for the Work;
- b) manage quality issues and their resolution; and
- c) ensure compliance with the Agreement.

Contractor shall provide details of the QA/QC organization it intends to employ at the Worksites. Contractor shall appoint sufficient qualified Personnel to ensure that the quality management system, specifically the quality control and inspection activities, including those pertaining to any part of the Work, are achieved.

7.0 QUALITY DOCUMENTS

The SDRL identifies specific quality documentation required from Contractor and defines the required submission dates and form of submission. The SDRL and instructions for Contractor document requirements are contained in document number LCP-PT-MD-0000-IM-PR-0015-01, Lower Churchill Project Supplier Document Requirements located in Exhibit 11 – Company Supplied Documents. Contractor shall ensure that it meets all quality documentation requirements outlined in the Agreement.

8.0 QUALITY PLAN

8.1 GENERAL REQUIREMENTS

Contractor shall submit a QP, prepared in accordance with this Exhibit 7, to the Engineer for review and Acceptance. The QP shall include all aspects of the Work. All QP revisions are subject to review and Acceptance by Engineer prior to being implemented. Contractor shall:

- a) Develop and maintain a QP stating the procedures, processes, resources and sequence of quality activities related to the Work;
- b) Mandate one person to be responsible for development, approval and follow up of the QP;
- c) Ensure QP review and revisions by Contractor's Personnel comprising representatives of all affected disciplines; and
- d) Upon request, provide Engineer with the procedures and instructions to which the QP refers.

8.2 QUALITY PLAN CONTENT

The QP shall:

- a) Accurately reflect the planning implemented by Contractor to comply with the Agreement;
- b) Apply the guidelines of ISO 10006:2003 - Quality Management Systems – Guidelines for Quality Management in Projects;
- c) Document any non-applicable requirement or any provision in the QP that does not comply with quality system requirements;
- d) Identify each of the main stages of execution for each of the deliverable elements of the Work;
- e) At a minimum, contain the following:
 - Scope;
 - Quality objectives;
 - Definitions, terms and abbreviations;
 - Organization chart and quality related roles and responsibilities associated with all phases of the Work;
 - Management review of Subcontracts;
 - Documentation and records management; and
 - Listing of all control procedures required to perform the Work (current and to be

- developed); and
- f) Provide detailed descriptions of:
- Responsibilities of Contractor's management related to QA/QC activities;
 - The systems and procedures Contractor will use to ensure that quality is an intrinsic part of all aspects of the Work;
 - Reviews, approvals required and checks and inspections to be conducted, including responsibilities and the timing of the required checks and inspections in the Work sequence;
 - How procurement documents will be prepared to properly establish quality requirements with Subcontractors (and Subcontractors' subcontractors of every tier). Contractor shall require that Contractor Group prepare a product specific or service specific quality plan for of the Work of such Subcontractors and subcontractors;
 - How Persons, to whom Contractor proposes to Subcontract any part of the Work, will be evaluated and selected to ensure they have the requisite resources, tools, procedures, and quality capabilities to meet established requirements (this requirement also applies to proposed subcontractors of Subcontractors of every tier);
 - How ITPs will be prepared. Each ITP shall include a list of the specifications that must be met, describe the tests that will be performed to ensure compliance, and identify who will perform the tests. Each plan shall identify inspections and QA/QC steps that will be taken by Contractor Group;
 - How records will be maintained to demonstrate that all design, materials, equipment and construction conforms to established requirements and how and in what form the records will be submitted to the Engineer;
 - How nonconformities, concessions and waivers shall be controlled and resolved including the process that will be used, the Personnel responsible for administering the process and the information flow through Contractor's organization for resolution;
 - How all instruments used for testing and inspection will be properly certified, including PMI devices, equipment for calibrating instrumentation and hydrostatic test gauges;
 - The auditing, appraising, sampling techniques, reviews and reporting Contractor intends to carry out for the Work to confirm the effectiveness of the QA/QC activities, and that the QMSs are indeed delivering the quality required;
 - How Contractor plans to meet requirements for PMI, source inspection and field quality control, including the frequency of testing, the locations where the testing will be conducted (e.g., Worksites, upon receipt at Worksites, following installation), and the type(s) of testing equipment to be used;
 - Control procedures that adequately address the controls required for quality activities; and
 - Acceptance and rejection criteria applicable to the activity and approval requirements.

8.3 QUALITY AUDITS AND MANAGEMENT REVIEWS

Contractor shall provide a schedule of quality audits (both internal and external) and quality management system reviews to be performed during execution of the Work. The schedule of quality audits shall identify those planned audits of Contractor Group.

The schedule of audits shall be provided to Engineer on the later of four (4) weeks before start of the Work or two (2) weeks after the Effective Date.

Contractor shall report progress, on a monthly basis, on implementing any actions that arise from the audits or management system reviews.

8.4 SURVEILLANCE OF SUBSUPPLIERS AND SUBCONTRACTORS

Contractor shall perform surveillance and inspection of Contractor Group as well as review and approve dossiers provided by the Contractor Group to ensure that the requirements of the Agreement have been met.

Contractor shall identify planned verification activities used to assess and manage Contractor Group to ensure compliance with requirements of this Agreement.

The verification activities shall be documented in the QP and reported monthly together with the progress on audits and management reviews.

9.0 INSPECTION AND TEST PLANS

9.1 GENERAL REQUIREMENTS

Contractor shall develop and submit its inspection and test plan (ITP), which shall include those of its Subcontractors (and Subcontractors' subcontractors of every tier), for review and Acceptance by the Engineer on the later of four (4) weeks before start of the Work or two (2) weeks after the Effective Date.

The ITPs shall cover all aspects of the Work to be executed by Contractor Group and shall implement and maintain all quality activities described therein.

Contractor will notify Engineer of all hold and witness points ten (10) Business Days prior to the scheduled date of such activity. Contractor will reconfirm the scheduled date of such activity seventy-two (72) hours prior to commencement. The Contractor shall identify upcoming hold and witness points for the next six (6) months in the Monthly Progress Report (as referenced in Exhibit 3 - Coordination Procedures).

9.2 INSPECTION AND TEST PLAN CONTENT

Contractor is required to follow all of the instructions below in preparing the ITPs, and

acknowledges that the Engineer review will be based on these instructions.

- a) Identification
 - Code the ITP, identify the revision and date;
 - Identify the Company, project and sector;
 - Identify the Agreement, as well as the component, discipline or system to which the ITP applies; and
 - Identify the Personnel responsible for quality, at all Worksites.
- b) Work Items and Steps
 - These are normally copied from the elements of the Contractor' Group's detailed Work schedule. Complimentary or specific details may be required; and
 - Contractor shall ensure ITPs, as far as practical, follow the normal sequencing of the Work. ITPs shall identify the stages requiring approval, inspection and testing hold and witness points.
- c) Control Activities
 - The control points, including their summary description (inspection, verification, tests) shall be inserted in the detailed Work schedule.
- d) Responsibilities
 - Identify Contractor's Personnel responsible for control activities.
- e) Frequency
 - Specify the percentage, frequency or sampling rate applicable to the control points.
- f) Reference to Specifications
 - Control activities shall refer to applicable drawings, specification sections and/or specifications/codes;
 - Identify parameters and characteristics that will be mainly considered in the controls; and
 - For each control, identify and note down the criteria and/or tolerances for approval.
- g) Procedures Used
 - Identify the procedures or instructions developed by Contractor or Subcontractors (or Subcontractors' subcontractors of every tier) to perform control and testing.
- h) Control Equipment
 - Describe and identify the equipment to be used for quality control. Users shall provide evidence of the calibration status.
- i) Checklists
 - The information identified above can be recorded in a checklist prepared by Contractor. The checklists shall be appended.
- j) Forms
 - Identify the forms to be used to record the control point results and append them to the ITP. The recorded results will constitute an inspection or testing report.
- k) Engineer's Control Points
 - The type of control points, namely: witness, hold or documentation review will

be identified during ITP review by the Engineer.

l) Quality Records

- Identify the types of records to be included in the quality records, to be submitted to the Engineer, and include the applicable standard table of contents.

m) Remarks

- Include all other relevant information that may be useful in carrying out the ITP.

9.3 FINAL INSPECTION AND DECLARATION OF COMPLETION

Appendix A - Declaration of Installation and Inspection Completion (“Declaration”) of this Exhibit 7 will be completed by Contractor upon completion of aspects of the Work. Contractor shall confirm that these aspects of Work are complete and comply with the requirements outlined in the Agreement, that all related quality records have been submitted to Engineer and confirm that Engineer carry out its final inspection on that aspect of Work.

Upon receipt of a Declaration, Engineer will conduct a final inspection of the aspect of Work described therein and, if necessary, issue a deficiency list if it is determined that the aspect of Work is not complete or includes elements that do not comply with the requirements of the Agreement.

When Contractor has corrected all deficiencies and the quality records are Accepted by Engineer, the Declaration will be Accepted by Engineer and an Accepted copy will be returned to Contractor.

10.0 NONCONFORMITY REPORTING

Contractor shall submit, to Engineer for review and Acceptance, its nonconformity, corrective action, preventive action procedure(s) and resolution reporting form.

Contractor will ensure that all nonconformities, which shall take on the definition of noncompliance with a requirement of ISO 9000:2005 Quality Management Systems – Fundamentals and Vocabulary, are recorded, investigated and resolved to Engineer’s satisfaction.

All of Contractor’s Personnel shall have a responsibility to identify apparent nonconformities arising from the execution of the Work.

Contractor shall maintain a register of all applicable and open nonconformity reports. The status of all NCRs shall be reported in the Monthly Progress Report (as referenced in Exhibit 3 - Coordination Procedures).

Contractor’s NCR form may be used but, at a minimum, it shall contain the following:

- a) Project number;

- b) NCR number;
- c) Supplier;
- d) Project name/location;
- e) Purchase order/agreement number;
- f) Product description (including part #, serial # and tag #);
- g) Date opened;
- h) Date closed;
- i) NCR description;
- j) Action by;
- k) Status;
- l) Root cause analysis;
- m) Resolution proposed; and
- n) Resolution Implemented.

Contractor shall identify Personnel responsible for verifying and resolving NCRs.

11.0 QUALITY RECORDS

Contractor's quality records shall include, as a minimum, the following documents:

- a) Inspector qualifications (quality control);
- b) Welder's qualifications ;
- c) Checklists;
- d) Relevant inspection and testing reports;
- e) Materials analysis certificates, when required;
- f) Steel works certificates;
- g) Paint specification sheet, when required;
- h) Identification and traceability documentation;
- i) Engineer Approved deviations;
- j) Closed out nonconformity reports, corrective and preventive actions;
- k) Completed test packages;
- l) Preservation records;
- m) Declarations to Authorities, when required;
- n) As-built drawings;
- o) As-built specifications;
- p) As-built bills of material;
- q) Various required manuals;
- r) All Accepted Declaration of Installation and Inspection Completion forms (Appendix A); and
- s) Shipping authorization.

Quality records shall be retained until the later of (a) seven (7) years after the satisfaction of all of the obligations of Contractor pursuant to this Agreement, (b) seven (7) years after expiration or any termination of this Agreement, or (c) such longer period as may be required under Applicable Laws. During this period, the quality records shall be available to Engineer and Company for inspection and audit.

12.0 ENGINEER'S ACTIVITIES

Engineer shall be entitled, at its sole discretion, to perform certain QA/QC activities, the performance of which shall not relieve Contractor of its responsibilities under this Agreement or its overall responsibility for quality of the Work. These QA/QC activities may include:

- a) Audit of Contractor's QA/QC program and include any or all of the following:
 - Review of Contractor's documented QA/QC plans and procedures;
 - Random review of Contractor's procurement documents for inspection and specification content;
 - Review of Contractor's specific equipment inspection and test plans in relation to specification requirements;
 - Review of inspector's surveillance and non-conformance reports, Contractor's deviation log, procedure approval logs;
 - Receipt of inspection discrepancy reports and field inspection reports;
 - Review of activities undertaken by Contractor Group;
- b) Independent source inspections. Results of Engineer source inspections will be made available to Contractor and Contractor shall address and resolve any issues arising from these inspections;
- c) Review and assessment of Contractor Group quality plans and ITPs;
- d) Review and assessment of Contractor's control procedures and audit schedule, monitoring compliance and monitoring resolution of any issues raised;
- e) Participation in selected pre-inspection and pre-production meetings;
- f) Conducting oversight of Contractor's quality activities including Contractor Group inspection activities, field inspection and surveillance activities, along with participation in inspection and test stages outlined in Accepted ITPs;
- g) Review and Acceptance of NCRs where proposed dispositions do not result in meeting specifications; and
- h) Other activities as deemed appropriate by Engineer.

APPENDIX A

DECLARATION OF INSTALLATION AND INSPECTION COMPLETION

	DECLARATION OF INSTALLATION AND INSPECTION COMPLETION	
Declaration No.: _____		Date: _____
Prepared by Contractor: _____		
Agreement No.: _____ Agreement Title: _____		
WORK DESCRIPTION: _____ _____ _____		
UNRESOLVED DEFICIENCIES: _____ _____		
<p>This document certifies that the Work described above has been completed, inspected and tested in accordance with the above-noted Agreement’s requirements, and that all quality records have been finalized and sent to the Engineer.</p> <p>Notes:</p>		
Contractor: Signature: _____ Date: _____	Engineer: Signature: _____ Date: _____	

EXHIBIT 8

SUBCONTRACTORS, MANUFACTURERS AND MATERIAL SOURCES

Manufacturers

Name of Manufacturer	Location of Manufacture (country of origin)	Location of testing and inspection	Item(s) of Manufacture	ISO registered ("YES" or "NO")	Relative value of the Work	Any other pertinent information
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Subcontractors

Name of Subcontractor	Location of Subcontractor (country of origin)	Services Provided	ISO registered ("YES" or "NO")	Relative value of the Work	Any other pertinent information
Consbec Inc.	Canada	Rock Drill/Blast	No	~\$3.5M-\$4.0M	N/A
Rock Construction & Mining Inc.	Canada	Rock Drill/Blast	No	~\$3.5M-\$4.0M	N/A
Explotech Engineering Ltd.	Canada	Drill & Blast Consultant	No	~\$10,000	N/A
DST Consulting Engineers	Canada	Drill & Blast Consultant	Yes	~\$10,000	N/A
Geophysics GPR International Inc.	Canada	Drill & Blast Consultant	Yes	~\$10,000	N/A
Nova Consultants Inc	Canada	Roads Design	Yes	~\$75,000	N/A
AMEC Earth & Environmental	Canada	Quality Control	Yes	~\$800,000	N/A

Material Suppliers

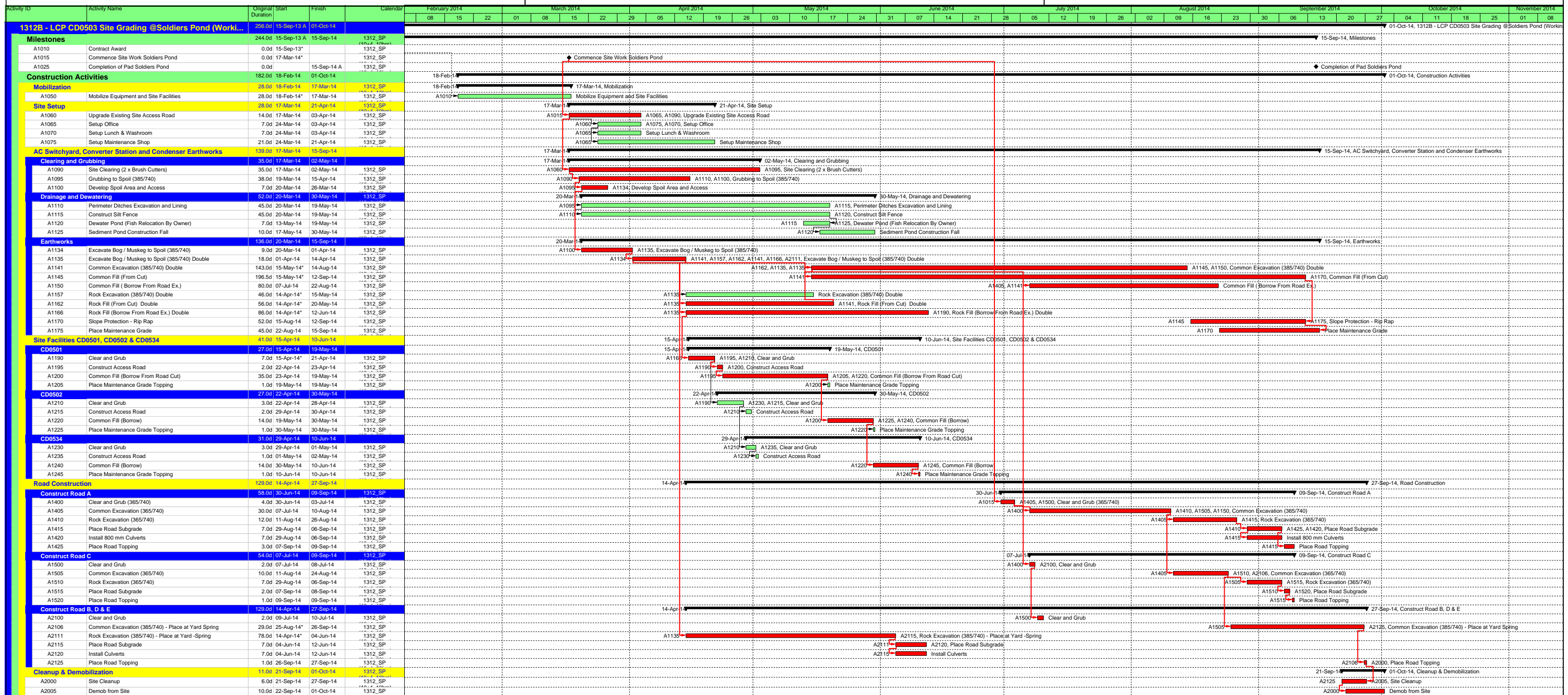
Material Supplied	Name of Supplier	Location of Supplier (country of origin)	ISO registered ("YES" or "NO")	Relative value of the Work	Any other pertinent information
Fencing	Apex Construction Specialities	Canada	No	~\$10,000	N/A
Geotextile	Armtec Ltd.	Canada	Yes	~\$100,000	N/A
Geotextile	Atlantic Industries Ltd.	Canada	Yes	~\$100,000	N/A
Culverts	Armtec Ltd.	Canada	Yes	~\$100,000	N/A
Culverts	Atlantic Industries Ltd.	Canada	Yes	~\$100,000	N/A
Aggregates	City sand & Gravel	Canada	N/A	~\$1.0M	N/A
Aggregates	Provincial Paving	Canada	N/A	~\$1.0M	N/A
Concrete	Capital Ready Mix	Canada	Yes	~\$10,000	N/A

EXHIBIT 9

WORK AND MILESTONE SCHEDULE

Work and Milestone Schedule

Item	Milestones	Date
1	Agreement Award	18-Oct-2013
2	Commence Work at Soldiers Pond	17-Mar-2014
3	Substantial Completion of Work at Soldiers Pond	15-Sep-2014



- █ Remaining Level of Effort
- █ Actual Work
- █ Remaining Work
- █ Critical Remaining Work
- ◆ Milestone
- Summary

H.J. O'CONNELL CONSTRUCTION LTD.
CD 0502
1312B - LCP CD0503 Site Grading @Soldiers Pond (Working)

Current Date: 14:16 , 16-Oct-13
Data Date: 15-Jul-13
Pg: 1

EXHIBIT 10

DECLARATION OF RESIDENCY

DECLARATION OF RESIDENCY

We represent that, for Canadian income tax purposes, **H. J. O'Connell Construction Limited** (the "Corporation") is a corporation resident in Canada. We attach a certified copy of the Corporation's certificate of incorporation (or certificate of amalgamation or continuance, or similar document, as applicable). If at any time the Corporation's residency status changes, we shall inform Company immediately by issuance of a revised "Declaration of Residency".

Name: Nolan Jenkins, P. Eng.

Title: Manager – Engineering & Business Development

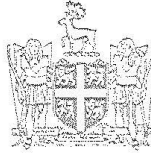
Signature: 

Date: November 13, 2013

Attached is a certified copy of:

- Certificate of Incorporation (or Certificate of Amalgamation or Continuance, or similar document, as applicable); and
- Current Certificate of Compliance from Industry Canada and/or a letter of good standing from the corporate jurisdiction under which the Corporation is formed or was continued.

No. 5478



Certificate of Incorporation

I hereby Certify, That the

H.J. O'Connell Construction Limited

is this day Incorporated under The Companies' Act, Cap. 168, Revised Statutes and that the Company is Limited.

Given under my hand and seal at St. John's, Newfoundland, this
-- 1st -- day of -- July -- One Thousand Nine Hundred
and Seventy



DEPUTY Registrar of Joint Stock Companies
for
Province of Newfoundland.

Exhibit 10
Declaration of Residency
Agreement Number: CD0503-002



Government of Newfoundland and Labrador
Department of Finance
Taxation and Fiscal Policy Branch
Tax Administration Division

November 06, 2013

Mr. Randall W Smith
Cox & Palmer
235 Water Street, Scotia Centre, Suite 1000
St. John's NL A1C 1B6

Dear Mr. Smith:

RE: H.J. O'Connell Construction Ltd.
90 O'Leary Avenue, St. John's, NL

In reply to your request of 10/30/2013, requesting a clearance certificate pursuant to the provisions of the following legislation:

Revenue Administration Act

We confirm that the above named client is a non registrant with the Department Of Finance, Tax Administration Division and that the division does not hold a lien on the property owned by : in particular the property at 90 O'Leary Avenue, St. John's, NL.

Without an audit being done, this letter serves as a qualified clearance.

Yours truly,

A handwritten signature in black ink that reads "Lisa Warren".

Lisa Warren, CA
Manager of Client and Support Services

/ fr

P.O Box 8720, St. John's NL A1B 4K1, Telephone (709) 729-6297, Facsimile (709) 729-2856

EXHIBIT 11

COMPANY SUPPLIED DOCUMENTS

Exhibit 11
 Company Supplied Documents
 Agreement Number: CD0503-002

This Exhibit contains a listing of documents that forms an integral part of this Agreement. Contractor shall be knowledgeable with all documentation and data listed herein.

Document No.	Title	Rev
LCP-AM-CD-8000-GT-RP-0001-01	Geotechnical Investigations Various Substations	B1
LCP-SN-CD-0000-EV-PL-0006-01	Contract Specific Environmental Protection Plan (C-SEPP)	B2
LCP-PT-MD-0000-HS-PL-0001-01	LCP Health and Safety Management Plan	B3
505573-0000-39RA-I-0002	LCP Risk Management Requirements for Contractors and Suppliers	00
LCP-PT-MD-0000-EV-PL-0010-01	LCP Integrated Project-Wide Environmental Protection Plan – Component 3 and 4A	B1
LCP-PT-MD-0000-IM-PR-0015-01	Supplier/Contractor Document Requirements	C1
LCP-SN-CD-0000-EV-PL-0005-01	Waste Management Plan - Component 1 and 4B	B3
MFA-PT-MD-0000-EV-PL-0002-01	Master Spill Response Plan	B2
LCP-PT-MD-0000-HS-PL-0005-01	LCP Security Management Plan	B1
LCP-PT-MD-0000-LR-SD-0001-01	Standard for Drug and Alcohol	B1
LCP-PT-MD-0000-LR-CT-0004-01	Lower Churchill Project Transmission Construction Collective Agreement Between Lower Churchill Transmission Construction Employers' Association Inc. and International Brotherhood of Electrical Workers and IBEW Local Union 1620	B1
LCP-PT-MD-0000-LR-CT-0006-01	Labour Project Agreement (“Project Agreement”) Summary of Key Provisions Transmission HVDC Components Lower Churchill Project Transmission Construction (“Project”) Review for Bidding Process	B1
N/A	Memorandum regarding Transmission Construction Collective Agreement Schedule C and Schedule F Gross Hourly Package Amendments dated 16-Oct-2013	N/A
N/A	Nalcor Code of Business Conduct and Ethics	N/A



**GEOTECHNICAL INVESTIGATIONS
VARIOUS SUBSTATIONS, WTO MF 1390**

CONTRACT: LC-SB-014

Submitted to:

**Nalcor Energy
Lower Churchill Project**

Hydro Place - 500 Columbus Drive
P.O. Box 12800
St. John's, NL, A1B 0C9

Submitted by:

**AMEC Environment & Infrastructure,
a Division of AMEC Americas Limited**

133 Crosbie Road
P.O. Box 13216
St. John's, NL, A1B 4A5

September 2012

AMEC Project No. TF11104105.1000



IMPORTANT NOTICE

This report was prepared exclusively for Nalcor Energy by AMEC Environment and Infrastructure (AMEC). The quality of information, conclusions and estimates contained herein is consistent with the level of effort involved in **AMEC's** services and based on: i) information available at the time of preparation, ii) data supplied by outside sources and iii) the assumptions, conditions and qualifications set forth in this report. This report is intended to be used by Nalcor Energy only, subject to the terms and conditions of its contract with AMEC. Any other use of, or reliance on, this report by any third party is at that party's sole risk.

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 Geotechnical Investigations
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 Newfoundland and Labrador
 September 2012



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14 September 2012

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14 September 2012

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Approved by: Rod Winsor, P Eng

14 September 2012

Date

REVISION HISTORY

Revision	Date
Draft Report: Geotechnical Investigations and Resistivity Testing Program– Various Sub - Stations	August 2012
Final Report: Geotechnical Investigations – Various Sub - Stations	September 14, 2012

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EXECUTIVE SUMMARY

Nalcor Energy (Nalcor) is proposing to develop hydroelectric generating and transmission facilities on the lower section of Churchill River, Labrador. This undertaking, termed the Lower Churchill Hydroelectric Generation Project (the Project), includes the construction of hydroelectric sites at Gull Island and Muskrat Falls. Power transmission to the Island of Newfoundland (i.e. the Labrador – Island Transmission Link) will be via a 1100 km, 900 MW, high voltage direct current transmission line.

The Project will require six (6) sites across Newfoundland and Labrador. These include converter stations and switchyards at Muskrat Falls and Soldiers Pond, a switchyard at Churchill Falls, an electrode compound at L'Anse-Au-Diable and transition compounds at Forteau Point and Shoal Cove.

AMEC Environment & Infrastructure, a Division of AMEC Americas Limited ("AMEC"), was retained by Nalcor to carry out a Geotechnical Site Investigation and Resistivity Testing at the proposed sites listed above.

The purpose of this work was to investigate site specific subsurface conditions through test pit excavations, bedrock probing, site observations, laboratory analysis and resistivity testing. The objective was to provide geotechnical recommendations and parameters to support preliminary design and construction. Fieldwork spanned from mid-May to early-July, 2012; laboratory testing and reporting was finalized in July 2012. No physical testing was performed at Muskrat Falls. A review of existing information was carried out and is reported under a separate cover.

The resistivity testing for this program is presented under separate cover.

Soldiers Pond Site

Fieldwork at the Soldiers Pond Site was performed from May 15 to May 22, 2012 and comprised the excavation and logging of 18 test pit excavations, and one (1) 36 m long trench. The site is vegetated with spruce and alder with low lying areas of marsh and bog. The ground surface is undulating with down gradient topography generally to the south-east. In general, the soil profile consisted of sand and gravel till overlying granitic bedrock of the Holyrood Intrusive Suite.

Based on the results of the available test pit and trench information, the subsurface conditions encountered at the Soldiers Pond Site are suitable to support the proposed structures. For example, for foundations based on the native sand and gravel till, and/or a maximum of 1.0 m thick engineered fill, overlying undisturbed sand and gravel till, the bearing capacity, in terms of Ultimate Limit States (ULS) and Serviceability Limit States (SLS) is as follows:

Spread Footing: Minimum 1.0 m wide

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Factored Geotechnical Resistance at ULS	375 kPa
Geotechnical Reaction at SLS	250 kPa

Geotechnical recommendations, parameters and other bearing capacities pertaining to this site are provided within the report.

Churchill Falls Site

Fieldwork at the Churchill Falls Site was performed from June 8 to June 10, 2012 and comprised the excavation and logging of 21 test pit excavations.

The final configuration of the station was unknown at the time of report submission as the substation may be moved further east to avoid interference with a stream running through the approximate center of the site. The original location was situated on the north side of Route 500, approximately 500 m east of the existing Churchill Falls switchyard. It is currently vegetated with spruce and some low lying areas of marsh and bog. The ground surface is hummocky with down gradient topography generally towards the southwest. In general, the soil profile consisted of gravelly sand till overlying granitic bedrock belonging to the Grenville Province of the Canadian Shield.

Based on the results of the available test pit information, the subsurface conditions encountered at the Churchill Falls Site are suitable to support the proposed structures. For example, for foundations based on the native sand and gravel till, and/or a maximum of 1.0 m of engineered fill, overlying undisturbed glacial till the bearing capacity is as follows:

Spread Footing: Minimum 1.0 m wide	
Factored Geotechnical Resistance at ULS	375 kPa
Geotechnical Reaction at SLS	250 kPa

Geotechnical recommendations, parameters and other bearing capacities pertaining to this site are provided within the report.

Forteau Point Site

Fieldwork at the Forteau Point Site was carried from June 11 to June 14, 2012. Note that it was communicated to AMEC that a revised location was situated approximately 500 m west upon completion of the field program. Thick brush at the revised site and the unavailability of wood cutting services created difficult working conditions to conduct the field program.

Forteau Point is situated on the south coast of Labrador, on the west side of Forteau Bay and is approximately six (6) km southwest of Point Amour. Both the original and revised

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sites are remote and are accessible by the existing all terrain vehicle (ATV) trails that leads from Route 510 and on foot along the Overfalls Brook Hiking Trail.

A total of 37 bedrock probes were carried out at the original proposed location. Apparent bedrock (assumed to be sandstone belonging to the Bradore Formation) was encountered at 27 of the 37 probed locations at depths ranging from 0.8 meters below ground surface (mbgs) to 1.8 mbgs. .

Based on the results of the available interpreted information, the subsurface conditions encountered at the revised Forteau Point Site are suitable to support the proposed structures. For example, for foundations based on a maximum of 1.0 m of engineered fill founded on bedrock and/or competent native soils, the bearing capacity is as follows:

Spread Footing: Minimum 1.0 m wide	
Factored Geotechnical Resistance at ULS	375 kPa
Geotechnical Reaction at SLS	250 kPa

Due to the lack of field information at this site, the recommendations and parameters outlined within this report should be classed as preliminary.

L'Anse-Au-Diable Site

Fieldwork at L'Anse-Au-Diable Site was performed on June 12, 2012 and consisted of a site traverse and visual observations. Nalcor had requested test pits at three (3) points near the landfall sections of the proposed breakwater. However, due to the presence of bedrock observed on air photos, it was decided that a site visit by an experienced engineering geologist would be adequate.

The rock exposed at the landfall abutments of the proposed breakwater is strong, durable granite gneiss with close to wide jointing and some pegmatite veins. Estimated rock properties that may be used for preliminary foundation design are provided within the report. The marine sediments believed to exist under the proposed footprint of the breakwater were not investigated as part of this program.

Shoal Cove Site

Fieldwork at the Shoal Cove Site was performed from June 15 to June 16, 2012 and comprised the excavation and logging of seven (7) test pit excavations and eleven (11) percussion probes. The site is located approximately 200 m east of Route 430 and is accessible by ATV or on foot. Currently the site is vegetated with spruce and fir with some low lying areas of marsh and bog.

In general, the soil profile consisted of marine sediment comprised of silt, sand and gravel overlying limestone bedrock of the Petit Jardin Formation. Apparent bedrock was

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encountered at eight (8) of the eleven (11) percussion probe locations at depths ranging from 0.6 mbgs to 1.6 mbgs.

Based on the results of the available test pit information, the subsurface conditions encountered at the Shoal Cove Site are suitable to support the proposed structures. It is recommended that any organic soils, peat, and marine sediment should be stripped and removed to expose bedrock prior to placement of engineered fill or foundation elements. For foundations based on a maximum of 1.0 m of engineered fill founded on bedrock and/or competent native soils, bearing capacity is as follows:

Spread Footing: Minimum 1.0 m wide	
Factored Geotechnical Resistance at ULS	375 kPa
Geotechnical Resistance at SLS	250 kPa

Geotechnical recommendations, parameters and other bearing capacities pertaining to this site are provided within the report.

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APPENDIX D AMEC REPORT No. TF1010482

“Gull Island, HVDC Shoreline Pond Electrode, Site Selection,
 Strait of Belle Isle”

APPENDIX E REFERENCES

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1.0 INTRODUCTION

Nalcor Energy (Nalcor) is proposing to develop hydroelectric generating and transmission facilities on the lower section of Churchill River, Labrador. This undertaking, termed the Lower Churchill Hydroelectric Generation Project (the Project), includes the construction of hydroelectric sites at Gull Island and Muskrat Falls.

The Muskrat Falls Hydroelectric Development (Muskrat Falls) will consist of a generating station with a potential generating capacity of 824 MW that will be constructed between 2012 and 2016. The Gull Island Hydroelectric Development (Gull Island) will consist of a generating station with a potential capacity of 2250 MW and is planned to be developed after Muskrat Falls. Gull Island is located 225 kilometers downstream from the existing Churchill Falls Generating Station, whereas Muskrat Falls is located 60 kilometers downstream of Gull Island. Interconnecting transmission lines will be installed between both of these generating sites and Churchill Falls. Power transmission to the Island of Newfoundland will be via a 1,100 km, 900 MW, high voltage direct current transmission line (HVdc), termed the Labrador - Island Transmission Link.

The Project will also require six (6) sites across Newfoundland and Labrador. These include converter stations and switchyards at Muskrat Falls and Soldiers Pond, a switchyard at Churchill Falls, an electrode compound at L'Anse-Au-Diable and transition compounds at Forteau Point and Shoal Cove.

With the exception of the Muskrat Falls station, AMEC Environment & Infrastructure, a Division of AMEC Americas Limited ("AMEC"), was retained by Nalcor to carry out a Geotechnical Site Investigation and Resistivity Testing at the proposed sites described above. Investigation work for the converter station and switchyard at Muskrat Falls were not included in the scope of this program.

Fieldwork spanned from mid-May to early-July, 2012; while laboratory testing and reporting was finalized in July 2012. The following report presents the site specific findings of the investigations and provides recommendations for preliminary foundation design and construction considerations.

1.1. Scope, Objective and Terms of Reference

The scope of work for this program was to provide complete engineering and project management services to execute a geotechnical investigation program to investigate the subsurface conditions throughout the five (5) proposed sites across Newfoundland and Labrador. This was achieved through test pit excavations, bedrock probing, site observations, laboratory analysis and resistivity testing. The objective was to provide

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geotechnical recommendations and parameters to support preliminary design and construction. These include (but are not limited to):

- Bedrock depth;
- Groundwater depth;
- Soil composition;
- Frost penetration depth;
- Bearing capacities;
- Expected short and long-term settlement values;
- Modulus of sub-grade reaction for design of surface bearing pads and equipment foundations;
- Identification of any requirements for protection of buried foundations and / or pipes; and;
- Site preparation. and
- Soil resistivity properties (reported under separate cover)

The services and expertise provided by AMEC throughout the duration of this project included the following works:

- Participation in technical sessions / workshops at the Nalcor and AMEC offices to provide an overview of the works, expectations and discussions.
- Management of the execution of the field program, management of all sub-contractor(s) and all associated logistics and the provision of technical services relating to field investigations and resistivity testing (under Nalcor's direction).
- Provision and management of a Health and Safety Plan, including a dedicated on-site Health, Safety & Environmental (HSE) Representative.
- Provision of an Environmental Protection Plan.
- Provision of a Quality Plan for the investigation as per AMEC's Quality Management System (QMS).
- Management of all permits required for work execution. AMEC acquired Operating and Commercial Wood Cutting Permits (where required); Nalcor attained the Water Fording Permit required in Shoal Cove.
- Participation in daily meetings between Nalcor and AMEC on-site personnel, as requested by Nalcor.
- On-site daily progress reporting to Nalcor.
- Collection and shipping of representative soil samples to AMEC's certified Materials Laboratory in St. John's, NL. Laboratory testing carried out included: coarse and fine gradation analysis, moisture content determination, Standard Proctor dry density analysis and Atterberg limits.
- Preparation and submission of the final technical report as defined and required by Nalcor.

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1.2. Report Contents

Presented within this report are the results of geotechnical investigation programs carried out at the five (5) proposed sites. Site specific geotechnical recommendations and construction considerations are also provided. Each site is discussed and divided into individual report sections.

Drawings, test pit records, bedrock probe records, and laboratory results are presented in the report appendices. An electronic PDF version of the report is included on a CD provided to the client. Native files were supplied on the same CD.

2.0 FIELD METHODOLOGY

2.1. Test Pit Excavations

AMEC field staff directed all excavation activities, logged the test pits and obtained soil samples for further analysis. Where possible, overburden soils were excavated to the bedrock surface. The soil profile was visually described with respect to its gradation/texture, color and moisture content. Indication of compactness condition and strength were inferred from excavator performance. Groundwater observations were made in the open test pits. All test pits were backfilled upon completion using nominal compactive effort. Summaries of the soil stratigraphy and groundwater surface depths encountered in the test pits excavated at the Soldiers Pond, Churchill Falls and Shoal Cove Sites are described in Sections 4.3, 5.3 and 8.3, respectively. Refer to the drawings in Appendix A for test location plans at each site; while corresponding test pit logs are presented in Appendix B.

2.2. Bedrock Probing

Bedrock probing was carried at the Forteau Point and Shoal Cove locations in an attempt to delineate bedrock depth. This work was directed by AMEC field staff.

At Forteau Point, overburden soils were probed to refusal by advancing a 1.8 m long, 20 mm diameter reinforcing bar with successive blows from a sledge hammer. Note that refusal was defined by the inability of the probe to advance and was signified by minimal movement and “bouncing” of the probe with each hammer blow. A ringing sound was also typically heard upon refusal.

Percussion drilling was the method utilized to probe for bedrock at Shoal Cove. This was achieved with a gas powered Pionjar drill and accompanying drill steel rods ranging from 0.6m to 1.8 m in length. The apparent bedrock interface was typically determined by an increase in drilling resistance. Forced air from the drill also returned rock cuttings to surface. Tabled summaries of the bedrock probing results carried out at the Forteau Point and Shoal Cove Sites are detailed in Sections 6.3 and 8.4, respectively.

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2.3. Laboratory Testing

Soil samples from test pits excavated at the Soldiers Pond, Churchill Falls and Shoal Cove locations were sealed in plastic bags, labeled and transported to the AMEC Materials Testing Laboratory in St. John's, NL. Select soil samples were submitted for some, or all of the following testing:

- Coarse gradation (ASTM C 136-06);
- Fine gradation – hydrometer (ASTM D 422-63);
- Natural moisture (ASTM C566-97);
- Standard Proctor dry density analysis (ASTM D698-07); and
- Atterberg limits (ASTM D 4318-10).

Summarized results of the geotechnical classification testing are provided in Sections 4.4, 5.4 and 8.5. Complete sets of results are attached in Appendix B.

3.0 GEOTECHNICAL INVESTIGATIONS

The soil and bedrock stratigraphic boundaries indicated on the test pit logs are inferred from field observations and excavator performance. These boundaries normally represent a transition from one material to another and do not necessarily represent exact surfaces of geological change. The subsurface conditions may vary substantially between and beyond the test pit locations.

Caution should also be exercised when defining the bedrock profile with the corresponding refusal depths outlined in the bedrock probe and percussion drilling summary tables. The reinforcing bar / drill steel rod may have been terminated on larger sized boulders. Refusal depths should therefore be used as a preliminary indication of "apparent" bedrock depth. Furthermore, the reinforcing bar / drill steel rod could penetrate highly-weathered and/or soft rock. As such, the "apparent" bedrock depth shown in this report could vary significantly from the actual depth to bedrock on site, particularly if "bedrock" is defined to include completely or highly weathered rock.

4.0 SOLDIERS POND

Proposed infrastructure associated with the Soldiers Pond Converter and Switchyard Station includes:

- HVdc Building with 30 ton Thyristor valves hanging by the ceiling;
- Control and utility buildings (single storey, pre-engineered metal);
- 400 ton transformers (supported on concrete mat foundations);
- Gantry or A - Frame dead end towers (with vertical reactions of 1,000 kN of thrust / uplift per tower leg);
- Switchyard light frame structures;

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- Synchronous Condenser Building with 3 synchronous condenser units, each having a mass of 350 tons; and
- Synchronous Hall with a 350 ton overhead crane supported by steel girders and steel columns.

Fieldwork was performed from May 15 to May 22, 2012 and comprised the excavation and logging of 18 test pits, and one (1) 36 m long trench. The test pits and trench were excavated with two (2) track-mounted excavators (CASE 160 and CASE 210CX) supplied by Fowlers Excavation Limited.

A total of 18 test pit locations were originally selected by Nalcor prior to the commencement of the field program. Four (4) (TP-01 to 04) of these test pits were planned to be excavated within the area of the Synchronous Condenser Building. It was later decided by Nalcor and AMEC personnel to replace these with a trench spanning the footprint of synchronous condenser units (TR-01 to TR-05). Therefore the test pit numbering sequences start at TP-05.

The on-site Nalcor representative also added a total of six (6) test pit locations (TP-A to TP-F). To determine fill quantities note that test pits TP-A and TP-B were not excavated due to the proximity of a raptors nest, which was discovered by AMEC field staff on May 18, 2012. Test pit TP-05 was also prematurely terminated as it was situated within the 200 m “no work” buffer zone encompassing the nest.

4.1. Site Description

The proposed location of the Soldiers Pond Site is shown on Drawing 1 in Appendix A1. It will be situated on the north side of Soldiers Pond and will be accessed via a proposed access road west of the site. The synchronous condenser yard will be placed to the north of the AC and converter yards.

Currently the site is vegetated with spruce, fir and alder with low lying areas of marsh and bog. Occasional large, surficial boulders are also evident across the site. The ground surface is undulating with elevations that range from approximately 210 meters above sea level (masl) to 160 masl; with down gradient topography generally to the south-east. Existing transmission lines run adjacent to the south section of the site. Refer to Drawing 2 (Appendix A1) for interpreted cross sections across the site.

4.2. Site Geology

The Soldiers Pond Site is located within an upland region of the Avalon Peninsula. The area has been glaciated as evident by the rounded hills and extensive glacial till deposits. These deposits are classified as hummocky terrain.

Bedrock in the area is dominated by granitic rocks of the Holyrood Intrusive Suite. Rock types can range from granite, to quartz monzonite and quartz diorite. Minor gabbro units

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are also known to exist within the area. Exposed bedrock, although not extensive, was observed at higher elevations to the north-north west outside the site.

4.3. Test Pit Excavations

In general beneath thin surficial accumulation of topsoil and bog, the soil profile consisted of glacial till overlying bedrock. Test pit depths ranged from 3.3 meters below ground surface (mbgs) to 7.7 mbgs. All reported depths are relative to the existing ground surface.

Test pit locations are provided on Drawing 1 in Appendix A1. Test pits excavated during the 2008 Site Investigation are shown on Drawing 3 in Appendix A1. Descriptions of the stratigraphy encountered at the test pit locations are presented on the test pit logs compiled in Appendix B1. Also shown on the test pit logs are photographs of the test pit excavation and its spoilage. Refer to Table 4-1 for a summary of the test pit findings.

Table 4.1: Summary of Subsurface Conditions - Soldiers Pond Site

Test Pit ID	Northing ²	Easting ²	Depth (mbgs ¹)			
			Till ³	Bedrock ⁶	Groundwater	Test Pit Termination
TP-05	5253598	350393	0.6	n/e ⁵	n/e	4.6
TP-06	5253585	350549	0.7	7.7	7.7	7.7
TP-07	5253552	350706	0.6	n/e	3.5	4.0
TP-08	5253450	350750	1.3	5.3	4.0	5.3
TP-09	5253364	350755	1.0	3.5	3.3	3.5
TP-10	5253429	350428	0.8	5.1	n/e	5.1
TP-11	5253449	350536	1.0	5.5	5.5	5.5
TP-12	5253336	350629	0.8	3.6	3.0	3.6
TP-13	5253309	350367	0.5	5.0	4.5	5.0
TP-14	5253246	350507	0.8	4.5	4.0	4.5
TP-15	5253252	350668	0.9	2.0*	1.9	4.0
TP-16	5253263	350860	0.6	3.5	n/e	3.5
TP-17	5253543	350898	0.9	3.5	3.0	3.5
TP-18	5253389	350870	0.6	5.5	3.5	5.5
TP-C	5253456	350295	0.7	6.5	n/e	6.5
TP-D	5253786	350116	0.9	6.6	n/e	6.6
TP-E	5253675	350107	0.8	4.4*	2.8	4.4
TP-F	5253887	350074	0.9	3.3	3.3	3.3

- Notes:
1. mbgs = meters below existing ground surface
 2. obtained with a hand held GPS unit – UTM, Zone 22, NAD 83
 3. includes depth to unweathered till
 4. * = depth to fractured bedrock
 5. n/e = not encountered
 6. confirmed and / or probable bedrock

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Rootmat / Topsoil

Approximately 0.1 m to 1.0 m thick accumulations of topsoil and peat were encountered at the surface at the test locations. This material typically consisted of rootlets, a mixture of organic material and underlying sand with traces of silt. The topsoil ranged from dark brown to black in color and was predominately loose and moist. In low lying wet areas the deeper soil compressed peat an abundance of surficial boulders (>0.5 m in diameter) were encountered in several test pit locations.

Weathered Till

Weathered till was encountered in 16 test pit locations underlying the surficial rootmat / topsoil layer. This soil composition generally consisted of sand and gravel with some silt. Trace to some cobbles and trace boulders were observed throughout this stratum. It was generally oxidized and ranged in colour from brown to reddish brown. It was moist to wet and its estimated compactness ranged from loose to compact. Its thicknesses ranged from 0.1 m to 1.3 m.

Till

Till was encountered at all test pit locations, typically underlying weathered till. The composition ranged from gravelly sand, sand and gravel, to sandy gravel mixture with trace to some silt, cobbles, and boulders. For simplicity, this native till is termed collectively as "sand and gravel till". This material was brown to light grey in color, moist to wet, with an estimated compactness that increased with depth from compact to very dense. It extended to depths between of 2.0 mbgs to 7.7 m mbgs.

Bedrock

Granite was encountered in all of the 18 test pit locations at depths ranging from 3.3 mbgs (TP-F) to 7.7 mbgs (TP-06). Note that fractured granite was encountered in test pits:

- TP-15 (2.0 – 4.0 mbgs); and
- TP-E (4.3 – 4.4 mbgs).

At these locations, angular pieces (up to 2.5 m in diameter in test pit TP-15) were excavated before refusal on sound rock.

Groundwater

Groundwater was encountered in 13 of the 18 test pit locations at depths ranging from 2.8 mbgs (TP-E) to 7.7 mbgs (TP-07). At the time of the field investigation, it was anticipated that the groundwater was near its highest level. This level is expected to slightly increase during the spring melt in March/April. Some seasonal variations in groundwater level should be anticipated.

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4.4. Trench Excavation

A summary of subsurface conditions encountered along the Synchronous Condenser trench is provided in Table 4-2. The trench was 36 m in length and divided into five (5) 7 m - 8 m long sections as shown in Drawing 1 in Appendix A1.

Table 4.2: Summary of Subsurface Conditions - Synchronous Condenser

Trench ID	Northing ²	Easting ²	Depth (mbgs ¹)			
			Till ³	Bedrock	Groundwater	Trench Termination
TR-01	5253660	350566	0.8	9.2	8.8	9.2
TR-02	5253653	350581	0.6	8.2	8.0	8.2
TR-03	5253654	350585	0.7	8.4	8.2	8.4
TR-04	5253656	350589	0.7	7.9	7.8	7.9
TR-05	5253655	350605	0.6	6.4	5.7	6.4

Notes: 1. mbgs = meters below existing ground surface
 2. obtained with a hand held GPS unit – UTM, Zone 22, NAD 83
 3. includes depth to unweathered till

Rootmat / Topsoil

Approximately 0.2 m to 0.4 m thick accumulations organic rich topsoil was encountered at the surface of all of the trenched locations. This material typically consisted of rootlets, a mixture of organic material and underlying sand with traces of silt. The topsoil ranged from dark brown to black in color and was predominately loose and moist. Numerous surficial boulders (1.5 m to 2.5 m in diameter) were encountered in all areas along the trench.

Weathered Till

Weathered till was encountered in all sections of the trench underlying the surficial rootmat / topsoil layer. This soil composition generally consisted of sand and gravel with some silt. Trace to some cobbles and trace boulders were observed throughout this stratum. It was generally oxidized and ranged in colour from brown to reddish brown. It was moist to wet with an estimated compactness of loose to compact. Its thicknesses ranged from 0.2 m to 0.8 m.

Till

Till was encountered in all of the trenched locations, underlying weathered till. Its composition ranged from gravelly sand / sand and gravel to a sandy gravel mixture, with trace to some silt and some cobbles and boulders. For simplicity, this native till is termed collectively as “sand and gravel till”. This material was light brown to grey in color, moist to wet and was estimated to be compact to dense. It extended to depths between 6.4 mbgs and 9.2 mbgs.

Bedrock

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Granite was encountered along the full length of the trench at depths ranging from 6.4 mbgs (TR-05) to 9.2 mbgs (TR-01). The bedrock could not be ripped by the excavator and was very strong with wide jointing. Typically this fresh unweathered granite would have a specific gravity of 2.5, a uniaxial compressive strength of 100MPa, and RQD of 75 – 90%.

Groundwater

Groundwater was encountered along the full length of the trench at depths ranging from 5.7 mbgs (TR-5) to 8.8 mbgs (TR-01). At the time of the field investigation, it was anticipated that the groundwater was near its highest level. Its level is expected to slightly increase from those observed during the spring melt in March/April. Some seasonal variations in groundwater level should be anticipated.

4.5. Laboratory Results

Six (6) representative till soil samples from test pits excavated within the proposed Soldiers Pond Site were selected for the following testing:

- Coarse gradation;
- Natural moisture; and
- Standard Proctor dry density analysis.

Table 4-3 summarizes the laboratory results; the complete set of results is attached in Appendix B1.

Table 4.3: Summary of Laboratory Results - Soldiers Pond Site

Sample ID	Sample Depth (mbgs ¹)	Gradation			Natural Moisture (%)	Standard Proctor Dry Density (kg / m ³)
		Gravel (%)	Sand (%)	Fines (%)		
TP-05	3.5 – 4.5	30.4	55.1	14.5	4.2	2219 @ 6.0%
TP-08	5.0 – 5.1	37.5	51.4	11.1	6.6	-*
TP-11	5.4 – 5.5	32.0	52.0	16.0	6.9	2174 @ 6.0%
TP-15	2.0	52.3	34.6	13.1	5.3	-*
TP-17	3.3 – 3.4	31.5	52.7	15.8	6.6	-*
TP-D	4.0 – 4.5	39.0	47.8	13.2	6.9	2236 @ 5.0%

Notes: 1. mbgs = meters below existing ground surface
 2. -* = not tested

One (1) representative till soil sample from the trench excavated within the footprint of the Synchronous Condenser was selected for the following testing:

- Coarse gradation;
- Natural moisture; and
- Standard Proctor dry density analysis.

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Table 4-4 summarizes the laboratory results; the complete set of results is attached in Appendix B1.

Table 4.4: Summary of Laboratory Results - Synchronous Condenser

Sample ID	Sample Depth (mbgs ¹)	Gradation			Natural Moisture (%)	Standard Proctor Dry Density (kg / m ³)
		Gravel (%)	Sand (%)	Fines (%)		
TR-03 Sample A	4.0 – 5.0	40.7	44.1	15.2	5.0	2277 @ 5.0%

Notes: 1. mbgs = meters below existing ground surface

4.6. Discussion and Recommendations

Based on the results of the available test pit and trench information, the subsurface conditions encountered at the site are suitable to support the proposed structures, using the site preparation and recommendations discussed in the following sections.

The recommendations provided are based on drawings and information provided in the project RFP. The structures that will be located at the Soldiers Pond Substation are:

- HVdc Building; Control Buildings (single story, pre-engineered metal building);
- Utility Buildings (single story, pre-engineered metal building);
- 400 tonne transformers and associated concrete pads;
- Gantry or A Frame Dead End Towers;
- Switchyard light frame structures;
- Synchronous Condenser Building housing 3 synchronous condenser units; and
- Synchronous Hall with a 350 ton overhead crane;

4.6.1. Site Preparation

Proper surface drainage is essential in order to reduce the potential for excess moisture penetration below foundation elements and slab-on-grade. Site grading should provide positive drainage away from the structures. Rainfall from the roofs of buildings should be directed away from the perimeters of the buildings.

Conventional earthwork equipment is anticipated to be capable of removing, replacing and re-compacting most of the site granular materials (till). Blasting and/or larger excavators equipped with impact hammers will likely be required for removing bedrock or large boulders if encountered in excavations above the design grade.

Improper site preparation could result in excessive total and/or differential settlement of the structure and/or trafficability issues. The following considerations are related to site preparation.

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4.6.2. Subgrade Preparation

Any organic soils (rootmat), weak or loose soil, and weathered till should be stripped and removed from the site to expose competent sand and gravel till prior to placement of engineered fill (if required). The subgrade should be proof rolled with a 10 tonne vibratory roller and all weak/loose soil must be completely removed and replaced with engineered fill.

The stripping operations should be supervised by qualified geotechnical personnel and foundation surface inspection should be approved by a qualified geotechnical personnel.

4.6.3. Site Grading

Engineered fill will be required to bring the South and eastern sides of the site to design subgrade elevation. Engineered fill will be placed after stripping all topsoil, any soil containing excessive organic matter and other unsuitable soil, within an area extending at least 2.5 m beyond the perimeter of the footprint of the proposed site.

Engineered fill should be a well graded sand and gravel or a high quality blast rock fill. The maximum allowable particle diameter should be 150 mm subject to engineering approval. All engineered fill shall be approved by geotechnical personnel and placed and compacted under controlled conditions using the following procedures:

- I. The area extent of engineered fill should be controlled by proper surveying techniques to ensure that the top of the engineered fill extends a minimum of 2.5 m beyond the perimeters of the structures to be supported. A maximum slope of 1V:1H (45°) constructed from engineered fill is to be maintained outside of this 2.5 m perimeter, if required on a temporary basis.
- II. Permanent exposed cut and fill slopes in the sand and gravel till and engineered fill should be trimmed to a maximum slope of 2H:1V (subject to confirmation by detailed slope stability analysis, if considered as necessary by the Geotechnical Personnel). Permanent slopes in the granite bedrock should be should be trimmed to a maximum slope of 1H:5V.
- III. The area to receive the engineered fill should be stripped of any topsoil, organic matter, fill and other compressible, weak and deleterious materials. After stripping, the entire area should be inspected and approved by the Geotechnical Personnel. Spongy, wet or soft/loose spots should be sub-excavated to stable subgrade and replaced with compactable approved soil, compatible with subgrade conditions, as directed by the Geotechnical Personnel.
- IV. The fill material should be placed in thin layers ranging from 200 mm to 300 mm in thickness, depending on the compaction equipment used. Oversize particles

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(cobbles and boulders) larger than 150 mm should be discarded, and each fill layer should be uniformly compacted with heavy compactors, suitable for the type of fill used. Under foundations fill should be compacted to at least 100 percent of its Standard Proctor Maximum Dry Density (SPMDD), while under roadways and the general yard area the fill should be compacted to at least 98 percent of its Standard Proctor Maximum Dry Density (SPMDD),.

- V. Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are necessary for the construction of a certifiable engineered fill and compaction procedure and efficiency should be closely monitored by the Geotechnical Personnel.
- VI. The engineered fill should not be frozen and should be placed at moisture content within 2 percent of the optimum value for compaction. The engineered fill should not be placed during winter months when freezing ambient temperatures occur persistently or intermittently.

The excavated sand and gravel till may be used as engineered fill however, it may require moisture conditioning. A potential borrow source is the hill to the northwest of the site (location of TP-D, TP-E and TP-F). If the onsite sand and gravel till contains excessive fine grained material (>20%), it may be mixed with blast rock fill prior to use for engineered fill. All materials to be used as engineered fill should be approved by the geotechnical personnel prior to placement.

4.6.4. Excavation and Construction Dewatering

It is expected that excavations will be required for the foundation elements and for any buried infrastructure. Conventional unsupported excavations are expected to be feasible where the groundwater table is below the bottom of the excavation. All excavations should be carried out in accordance with applicable occupational health and safety rules and regulations including, but not limited to, Sections 404 to 416 of the Newfoundland and Labrador Occupational Health and Safety Regulations.

Temporary unsupported excavations above the groundwater table and no more than 1.0 m deep should be sloped no steeper than 1H:1V (Horizontal:Vertical; H:V). Flatter slopes will likely be required if weak soil layers are encountered during the excavation. Unsupported excavation below the groundwater table or excavation deeper than 1.0 m should be analyzed on a case-by-case basis.

Groundwater levels recorded during the excavation of the test pits and trenches indicate a groundwater surface between 1.9 m and 7.7 m below ground surface. Dewatering from the excavation should be achievable by a series of filtered sumps and pumps, and/or gravity drains. Permanent pumping will be required from sumps in the condenser

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excavation. It is recommended that the perimeter of the site on the upslope side (north and east sides) is ditched to convey drainage away from the site. It is recommended that the perimeter of the site on the upslope side (west side) is ditched to convey drainage away from the site. Test pits should be excavated, where necessary, to determine the appropriate method of dewatering prior to full excavation.

Stockpiles of materials and excavated soil should be placed away from the crest of excavations by a distance equal to at least one half of the depth of the excavation or 2.0 m, whichever is greater.

4.6.5. Foundations

Conventional spread or strip footings are considered a feasible foundation system for the structures at this site. Other possible foundation alternatives are not considered feasible for the following reasons:

- Steel piles – abundance of boulders in till will make pile driving difficult
- Screw piles - abundance of boulders, cobbles in till will cause damage to pile flights;
- Concrete caisson – casing will be required in areas of shallow groundwater and drilling of pile holes will be difficult due to boulders in till.

Footings may be founded on the native, compact to dense sand and gravel till, engineered fill or bedrock. For foundations based on the native, dense to very dense, sand and gravel till, and/or a maximum of 1.0 m thick engineered fill, overlying undisturbed sand and gravel till (prepared in accordance with Section 4.7.3.), the bearing capacity, in terms of Ultimate Limit States (ULS) and Serviceability Limit States (SLS) is as follows:

Spread Footing: Minimum 1.0 m wide	
Factored Geotechnical Resistance at ULS	375 kPa
Geotechnical Reaction at SLS	250 kPa

Foundations based on the engineered fill with thicknesses greater than 1.0 m, the bearing capacity is as follows:

Spread Footing: Minimum 1.0 m wide	
Factored Geotechnical Resistance at ULS	225 kPa
Geotechnical Reaction at SLS	150 kPa

If due to large foundation loads or required significant depth of embedment (i.e. Synchronous Condenser foundation at 17 m below final grade), such that foundations are required to be supported on the underlying granite bedrock, the following bearing capacities should be used:

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Spread Footing: Minimum 1.0 m wide	
Factored Geotechnical Resistance at ULS	1500 kPa
Geotechnical Reaction at SLS	1000 kPa

The bedrock surface should be solid without significant fractures, and should be cleaned of loose, weathered rock and other deleterious materials. The quality of the bedrock could not be determined from the test pits or bedrock probing; therefore, inspection of the bedrock surface by qualified geotechnical personnel is recommended to confirm the bearing capacity can be achieved.

During construction, the footing subgrade should be inspected by qualified geotechnical personnel to confirm that the underlying soil has adequate bearing capacity. Similarly, the placement and compaction of engineered fill for foundations should be conducted under the supervision of qualified geotechnical personnel. If any weak materials, such as loose pockets of soil, are encountered during construction, these materials should be completely removed and replaced with engineered fill and compacted to 100 percent of Standard Proctor Maximum Dry Density (SPMDD).

The footing subgrade should be protected at all times from rain, snow, freezing temperatures and the ingress of free water. Concrete should not be placed on frozen soil, nor should the soil beneath the footing be allowed to freeze after construction of the footing.

The maximum frost penetration calculated for this location is 1.7 m. For frost protection, a minimum of 1.7 m of soil cover, or its thermal equivalent must be maintained around footings.

Settlements of shallow spread footings will vary depending on the magnitude of load, load distribution, depth and size of footing and subgrade soil/rock type(s). However, if the recommendations of this report are adhered to, it is expected that settlements associated with the geotechnical reactions at SLS provided above would be in the order of up to 25 mm total and 20 mm differential, for well prepared bearing surfaces. Foundations based on sound bedrock will have negligible settlement.

It should be noted that the SLS and ULS values provided, together with settlements, are intended for preliminary sizing of foundations. If accurate values are required, detail foundation analysis should be carried out by considering the foundation subgrade conditions, foundation sizes and loadings. In areas of deep fills, creep settlement of the placed fill may pose additional total and differential settlement. Typical creep settlement

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for fill placed in accordance with Section 4.6.3 is 5 mm \pm 2 mm for every 1 m of fill thickness.

Construction difficulties might arise if a shallow groundwater table is encountered. Temporary dewatering discussed in Section 4.6.4 will be required for footings constructed below the groundwater table.

4.6.6. Lateral Earth Pressures

Foundation will be required to resist lateral earth pressures. Table 4-5 below provides the recommended earth pressure coefficients for the active, passive and “at rest” earth pressure cases for various soil types, as well as the total unit weights.

The earth pressure coefficients in Table 4-5 are based on the Rankine theory and do not include wall friction angles in the calculations. Inclusion of the wall friction angles in the calculation of passive coefficients is not recommended. Since large lateral displacements are required to mobilize the full passive resistance, the passive earth pressure coefficients include a Factor of Safety of 1.5.

Table 4.5: Earth Pressure Coefficient, Soil Unit Weights and Wall Friction Angles

Soil Type	Active Pressure Coefficient K_a	“At Rest” Earth Pressure Coefficient K_o	Passive Pressure Coefficient K_p	Total Soil Unit Weight kN/m^3	Friction Angle Between Soil and Concrete in degrees
Engineered Granular Fill	0.33	0.50	3.0	21.0	22
Native Sand and Gravel Till	0.30	0.47	3.3	21.0	24

4.6.7. Slab-on-Grade

Grade-supported concrete floor slabs should be constructed on a prepared subgrade as recommended in Section 4.7.2. Based on proposed grades, the slab subgrade will be engineered fill and/or native till. Prior to placement of concrete, the entire area should be proof rolled using a 10 tonne vibratory roller and observed by a qualified geotechnical representative.

A minimum of 100 mm thick, clean, washed, crushed gravel should be provided beneath all floor slabs. For heavy floor loads, the crushed gravel should be compacted to at least 100% SPMDD. Should elevations be such that floor slabs are below the exterior finished grade, a properly designed and installed weeping tile drainage system is required. A damp-proofing membrane or similar should be installed under concrete slabs-on-grade. Based on design grades and groundwater levels encountered, a

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permanent subdrainage system may not be required. However, if the design grade changes, then this requirement may need to be re-addressed.

The recommended live load on the slab-on-grade is up to 20 kPa. For higher live load the slab-on-grade should be designed as a mat foundation by considering the soil conditions underlying the mat foundation and its impact on any adjacent foundations. All slabs should be structurally independent from walls and columns supported on foundations. Should heavy, concentrated loads be expected near the perimeter of slabs, thickened and reinforced slab edges should be structurally designed accordingly. This will reduce any structural distress that may occur as a result of differential soil movements.

The amount of relative movement and differential settlement within the slabs will vary depending on the soil conditions below the slab and the magnitude of the load supported by the slab. To calculate the amount of slab movement due to the live load, the soil may be modeled as linear springs based on the modulus of subgrade reaction (MSR) or similar analytical methods. A MSR of 20 MPa/m can be used for the engineered fill and 25 MPa/m if the slab subgrade is the native, dense to very dense, glacial till.

If the calculated differential movements are considered intolerable, then an alternative slab support system such as dowelled joints in the slab-on-grade, or a structural slab supported by foundations or mat foundations should be considered.

The excavated subgrade beneath slabs-on-grade should be protected at all times from rain, snow, freezing temperatures, excessive drying and the ingress of free water.

4.6.8. Soil Properties for Dynamic Analysis

It is understood that there will be vibratory machinery at the site. Based on the soil conditions observed in the boreholes, the recommended values for dynamic soil parameters are summarized in Table 4-6.

Table 4.6: Dynamic Soil Properties- Soldiers Pond Site

Soil Type	Shear Modulus G (MPa)	Poisson's Ratio ν	Soil Unit Weight (kN/m ³)	Internal Soil Damping (D _i)
Native Sand and Gravel Till	40 – 60	0.25 - 0.35	21	0.03 – 0.05
Bedrock	1500 - 5500	0.10 - 0.30	26	0.03 – 0.05

These values for the shear modulus are for small strains in the order of 10^{-6} , and therefore the modulus values should be compatible with the strain levels indicated in the analyses. The above values are based on judgment and empirical correlations, and therefore in the dynamic analysis the shear modulus should be considered over the given ranges or measured on site.

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In the preliminary design of foundations supporting vibratory equipment, the load capacities determined from the SLS and unfactored ULS bearing capacity values should be reduced by 30 and 50 percent for centrifugal and reciprocating equipment, respectively. The foundation supporting the vibratory loads may need to be adjusted to suit the predicted response of the system. Following a review of the dynamic analyses and the specifications for the vibratory machines, it may be possible to increase the foundation load capacities.

Increasing the size of the foundation to soil contact area increases damping (everything else being equal). Therefore, this area should be made as large as practicable.

The majority of machinery vibration problems are not related to foundation conditions. Careful detailing of ancillary equipment is important to ensure that unwanted vibrations will not develop in the system. As a general rule, auxiliary equipment should be supported on the same mat as the machine.

4.6.9. Seismic Design Considerations

In conformance with the criteria in Table 4.1.8.4A, Part 4, Division B of the National Building Code (NBC 2010), the site is classified as Site Class “B - Rock” for sound bedrock, “C - Very Dense Soil” for very dense unweathered sand and gravel till and fractured bedrock, or Site Class “D – Stiff Soil” for compact and dense unweathered sand and gravel till/engineered fill, depending on the soil type supporting the foundations and its thickness. The four values of the Spectral response acceleration $S_a(T)$ for different periods and the Peak Ground Acceleration (PGA) can be obtained from Table C-2 in Appendix C, Division B of the NBC (2010). The design values of F_a and F_v for the project site should be calculated in accordance to Table 4.1.8.4 B and C.

Field testing to determine the shear wave velocity within the top 30 m thick soil/rock underneath the foundation should be carried out if more accurate values are required.

4.6.10. Rock Anchors

Rock anchors may be required for shallow foundations based on bedrock near the grade elevation. For anchor design purposes the following empirical parameters may be used:

- | | |
|---|----------------------|
| • Dry unit weight of undisturbed bedrock | 28 kN/m ³ |
| • Specific gravity of bedrock | 2.7 |
| • Angle of internal of friction (undisturbed bedrock) | 40° |
| • Assumed apex angle | 90° |
| • Unconfined Compressive Strength of Intact Bedrock | 100 MPa |
| • Estimated RQD | 75-90% |

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- Minimum Depth of Embedment 3.0 metres

Mechanical anchors are feasible for this based on the excellent quality of the bedrock encountered. Long sleeves are recommended and an allowance provided for grout anchors in the event that a poorer quality rock is encountered at depth and the test load cannot be maintained. If more than one rock anchor is to be use for a particular foundation element then group effects need to be considered. Corrosion protection should be provided for the anchors.

The contractor must excavate to solid, un-weathered rock before drilling any anchor holes. Prior to the placement or construction of the anchors/foundation, all surficial soils and any loose or weathered bedrock should be removed. Should differing conditions be encountered during installation, then those presented in this report, AMEC must be contacted to review these findings and determine if the published perimeters are applicable and revise accordingly.

4.6.11. Access Roads

The proposed access road into the substation site will be over bedrock outcrops with sporadic overlying till areas. It is anticipated the some blasting will be required. In areas, where high rock faces will be required, provide back slopes of 1H to 5V for stability. Provide wide catch ditches of at least three metres at the toes of high slopes. Provide benches in high rock slopes every ten metres or less. Provide top of slope berms or fences for safety.

The till encountered along the access road right-a-way and at the station site may be used in the preparation of the sub-grade provided it is moisture conditioned ($\pm 2\%$ of optimum), removed of boulders, and compacted to 98% standard proctor maximum dry density (SPMDD). Additional rock fill may be required in areas where the *insitu* soil is saturated and soft.

The rock fill shall consist of hard durable rock particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials. The following gradation limits are recommended:

Sieve Size	% Passing
200 mm	100
100 mm	75-100
25 mm	50-80
4.76	20-55
1.2	10-35
0.3	5-20
0.075	<8

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The following specifications are recommended for rock fill placement:

- Place and compact rock fill in continuous horizontal layers not exceeding 300 mm loose and compacted using a 10 tonne vibratory roller utilizing a minimum of 8 passes in each direction;
- The extent of the rock fill to be controlled by proper surveying techniques;
- After stripping and rough grading using onsite till, the sub-grade shall be visually inspected by AMEC to assist in identifying and addressing any soft areas prior to placement of rock fill;
- Oversized particles (cobbles and boulders) larger than 200 mm should be discarded and each fill layer should be uniformly compacted to 100% of its Standard Proctor Maximum Dry Density (SPMDD) within the roadway. Field density testing by visual inspection during proof rolling by experienced geotechnical personnel is required;
- Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are recommended; and,

The gradation of the road gravel surfacing is recommended to be in accordance with the Department of Transportation and Works, Maintenance Grade 2 specification, and compacted to 100% SPMDD. The thickness of the road gravel should be 300 mm. The road gravel shall consist of hard durable rock particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials. The following gradation limits are recommended:

Sieve Size	% Passing
25 mm	100
9.5 mm	55-80
4.76	35-60
1.2	15-35
0.3	5-20
0.075	3-10

4.6.12. Water Wells

The facilities at Soldier's Pond are within bedrock Hydrostratigraphic Unit A as shown in Hydrogeology of the Avalon Peninsula Area, published by the Provincial Department of Environment. This unit generally has drilled wells with depths of from 44 m to 155 m and producing from 1.1 liters per minute (l/min) to 137 l/min with a mean of 25 l/min.

5.0 CHURCHILL FALLS

Proposed infrastructure associated with the Churchill Falls Switchyard Station includes:

- 250 ton transformers (supported on concrete mat foundations);
- Control and utility buildings (single storey, pre-engineered metal);

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- Gantry or A - Frame dead end towers (with vertical reactions of 1,000 kN of thrust / uplift per tower leg); and
- Switchyard light frame structures.

Fieldwork was executed from June 8 to June 10, 2012 and comprised of the excavation and logging of 21 test pit excavations. Test pits were excavated with a Deere 240 DLC track-mounted excavator supplied by C&T Enterprises Limited. Newfoundland and Labrador Vegetation Control Limited (NLVC) provided line cutting/ wood clearing services.

A total of 28 test pit locations were originally selected by Nalcor prior to the commencement of the field program. The on-site Nalcor representative assessed all proposed test pit locations for accessibility and priority. During site reconnaissance, a stream was also found to run through the approximate center of the site. This resulted in the relocation of some test pit locations. Refer to Table 5-1 for a summary of planned and actual number of test locations carried out at the proposed Churchill Falls Station.

Table 5.1: Proposed and Actual Test Pit Locations - Churchill Falls Site

Test Pit ID	Originally Proposed	Test Pit Excavated	Action
TP-1	Yes	No	Cancelled By Client
TP-2	Yes	No	Cancelled By Client
TP-3	Yes	No	Cancelled By Client
TP-4	Yes	No	Cancelled By Client
TP-5	Yes	No	Cancelled By Client
TP-6	Yes	No	Cancelled By Client
TP-7	Yes	No	Cancelled By Client
TP-8	Yes	No	Cancelled By Client
TP-9	Yes	No	Cancelled By Client
TP-10	Yes	No	Cancelled By Client
TP-11	Yes	No	Cancelled By Client
TP-12	Yes	Yes	-
TP-13	Yes	No	Cancelled By Client
TP-14	Yes	No	Cancelled By Client
TP-15	Yes	No	Cancelled By Client
TP-16	Yes	Yes	-
TP-17	Yes	Yes	-
TP-18	Yes	Yes	-
TP-19	Yes	Yes	-
TP-20	Yes	Yes	-
TP-21	Yes	No	Cancelled By Client
TP-22	Yes	No	Cancelled By Client

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Test Pit ID	Originally Proposed	Test Pit Excavated	Action
TP-23	Yes	Yes	-
TP-24	Yes	Yes	-
TP-25	Yes	No	Cancelled By Client
TP-26	Yes	Yes	-
TP-27	Yes	Yes	-
TP-28	Yes	Yes	-
TP-A	No	Yes	Added By Client
TP-B	No	Yes	Added By Client
TP-C	No	Yes	Added By Client
TP-D	No	Yes	Added By Client
TP-E	No	Yes	Added By Client
TP-F	No	Yes	Added By Client
TP-G	No	Yes	Added By Client
TP-H	No	Yes	Added By Client
TP-I	No	Yes	Added By Client
TP-J	No	Yes	Added By Client

5.1. Site Description

The site location, outlined on Drawing 4 (Appendix A2), is situated on the north side of Route 500, approximately 500 m east of the existing Churchill Falls switchyard.

It is currently vegetated with spruce and fir with some low lying areas of marsh and bog. The ground surface is hummocky with elevations that range from approximately 369.1 masl to 418.7 masl; with down gradient topography generally towards the southwest. Two (2) existing transmission lines run through the site; a 13.8 kV line to the East Forebay Structure and a 138 kV line to Goose Bay. An existing access road originating from Route 500 also runs through the east section of the site.

5.2. Site Geology

The area has been glaciated as evident by the rounded hills and deposits of glacial till. Observed deposits generally appear as hummocky till.

Bedrock at the site comprises a granitoid suite belonging to the Paleohelikian Group. The rock can be described as a granitoid gneiss (consisting mainly of grey to pink quartz, feldspar, biotite and hornblende) that is variably mylonitic and magmatic in texture. Rock composition can also vary from a granitic gneiss to quartz diorite and granodiorite. Limited exposed bedrock was observed at higher elevations of the site.

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5.3. Test Pit Excavations

In general, the soil profile consisted of glacial till overlying bedrock. Test pit depths ranged from 1.9 mbgs to 7.9 mbgs. All reported depths are relative to the existing ground surface.

Approximate test pit locations are provided on Drawing 4 in Appendix A2. Descriptions of the stratigraphy encountered at the test pit locations are presented on the test pit logs compiled in Appendix B2. Also shown on the test pit logs are photographs of the test pit excavation and its spoilage. Refer to Table 5-2 for a summary of the test pit findings.

Table 5.2: Summary of Subsurface Conditions - Churchill Falls Site

Test Pit ID	Northing ²	Easting ²	Depth (mbgs ¹)			
			Till ³	Bedrock	Groundwater	Test Pit Termination
TP-12	5931418	436596	1.0	2.0*	2.4	2.4
TP-16	5931276	436592	1.0	7.5*	7.5	7.9
TP-17	5931250	436597	0.9	3.7	3.5	3.7
TP-18	5931352	436675	0.6	2.8	2.3	2.8
TP-19	5931291	436678	0.6	2.3*	1.7	2.8
TP-20	5931221	436695	1.9	3.5	1.8	3.5
TP-23	5931287	436744	0.6	2.3	1.1	2.3
TP-24	5931357	436778	1.0	3.4	2.9	3.4
TP-26	5931225	436784	1.6	2.7	Not Determined – Excessive Surface Water	2.7
TP-27	5931147	435753	0.8	4.1	4.1	4.1
TP-28	5931118	435754	0.9	4.7	3.0	4.7
TP-A	5931278	436852	1.6	4.4	4.4	4.4
TP-B	5931328	436867	0.9	2.6	2.5	2.6
TP-C	5931370	436872	0.6	3.1	2.8	3.1
TP-D	5931328	437118	0.8	5.3*	4.8	6.1
TP-E	5931438	437091	1.5	3.3*	3.5	3.9
TP-F	5931378	437108	1.3	1.9	1.9	1.9
TP-G	5931257	436369	1.1	2.8*	1.0	3.2
TP-H	5931317	436387	0.5	4.1*	4.0	4.4
TP-I	5931189	436365	0.7	4.2	4.2	4.2
TP-J	5931131	436360	0.8	4.2*	4.4	4.4

- Notes: 1. mbgs = meters below existing ground surface
 2. obtained with a hand held GPS unit – UTM, Zone 20, NAD 83
 3. includes depth to unweathered till
 4. * = depth to fractured bedrock

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Rootmat / Topsoil

Approximately 0.1 m to 0.7 m of organic material and organic rich soil was encountered at the surface of all the test pits (with the exception of test pit TP-26 where cobbles and boulders comprised the upper 1.0 m of the soil horizon). This material typically consisted of rootmat and a mixture of organic material and underlying soil. It was predominately loose, compressible and moist.

Peat

Peat was encountered at the surface of test pit TP-26 and comprised rootlets, organic rich soil and bog. It was approximately 1.0 m thick, loose, compressible and wet. Some surficial boulders were also observed throughout this horizon.

Fill

Fill composed of sand with some gravel, silt and some to abundant boulders was found beneath the rootmat / topsoil at one (1) test pit location (TP-20). It was brown to grey, loose to compact and extended to approximately 1.0 mbgs. Some rootlets and metal debris were intermixed with this material.

Weathered Till

With the exception of test pits TP-20 and TP-26, weathered till was encountered in all test pits underlying the rootmat / topsoil. It was found to underlie fill and peat in test pits TP-20 and TP-26, respectively. Its composition ranged from a mixture of sandy silt with trace to some gravel to a gravelly sand with trace to some silt. The soil was typically loose to compact, oxidized, moist and reddish-brown. Its thickness ranged from 0.3 m to 1.0 m. Some to abundant surficial cobbles and boulders were also observed within this stratum at the majority of the test pit locations.

Till

Till was encountered in all test pits underlying the weathered till. Its composition ranged from a silty, gravelly sand to a sand and gravel with some silt. However, a gravelly sand mixture with some silt was found in the majority of the test pit locations. The till was typically dense, moist to wet, dark brown to grey and its thickness ranged from 0.6 m to 6.5 m. Some cobbles and boulders were also observed within this stratum.

Bedrock

Bedrock was encountered in all test pits at depths ranging from 1.9 mbgs (TP-F) to 7.5 mbgs (TP-16). Note that fractured bedrock was encountered in test pits:

- TP-12 (2.0 – 2.4 mbgs);
- TP-16 (7.5 – 7.9 mbgs);
- TP-19 (2.3 – 2.8 mbgs);
- TP-D (5.3 – 6.1 mbgs);
- TP-E (3.3 – 3.9 mbgs);
- TP-G (2.8 – 3.2 mbgs);

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- TP-H (4.1 – 4.4 mbgs); and
- TP-J (4.2 – 4.4 mbgs).

At these locations, angular pieces of bedrock intermixed with sand and gravel were excavated before refusal on sound bedrock.

Groundwater

Groundwater was encountered in all test pits at depths ranging from 1.0 mbgs (TP-G) to 7.5 mbgs (TP-16). At one (1) test pit location (TP-26), excessive surface water influx made it difficult to evaluate the groundwater level. At the time of the field investigation, it was anticipated that the groundwater was near its highest level. Its level is expected to slightly increase from those observed during the spring melt in March/April. Some seasonal variations in groundwater level should be anticipated.

5.4. Laboratory Results

Six (6) representative soil samples from test pits excavated within the proposed Churchill Falls Site were selected for the following testing:

- Coarse gradation;
- Natural moisture; and
- Standard Proctor dry density analysis.

Table 5-3 summarizes the laboratory results; the complete set of results is attached in Appendix B2.

Table 5.3: Summary of Laboratory Results - Churchill Falls Site

Sample ID	Sample Depth (mbgs ¹)	Gradation			Natural Moisture (%)	Standard Proctor Dry Density (kg/m ³)
		Gravel (%)	Sand (%)	Fines (%)		
TP-12	1.5 – 2.0	35.6	51.5	12.9	7.2	-
TP-16	3.5 – 4.5	36.9	51.7	11.4	5.2	2222
TP-20	3.0 – 3.5	30.3	54.5	15.2	8.0	-
TP-28	3.5 – 4.0	15.9	54.0	30.1	5.6	2260
TP-C	2.5 – 3.0	39.7	47.1	13.2	5.9	-
TP-D	4.0 – 5.0	35.2	54.6	10.2	6.3	-
TP-G	1.5 – 2.5	26.8	51.7	21.5	7.3	2208

Notes: 1. mbgs = meters below existing ground surface

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5.5. Discussions and Recommendations

Based on the results of the available test pit information, the subsurface conditions encountered at the Site are suitable to support the proposed structures, using the site preparation and recommendations discussed in the following sections.

The recommendations provided are based drawings and information provided in the project RFP. The structures that will be located at the Churchill Falls Station are as follows:

- Transformers and associated concrete mat foundations;
- Control and Utility Buildings (single story, pre-engineered metal);
- Gantry or A Frame Dead End Tower; and
- Switchyard light frame structures.

5.5.1. Site Preparation

Proper surface drainage is essential in order to reduce the potential for excess moisture penetration below foundation elements and grade-supported slabs. Site grading should provide positive drainage away from the structures. Rainfall from the roofs of buildings should be directed away from the perimeter of the buildings.

Conventional earthwork equipment is anticipated to be capable of removing, replacing and re-compacting most of the granular materials. Blasting and/or excavators equipped with impact hammers will likely be required for removing bedrock or large boulders if encountered in excavations above the design grade.

Improper site preparation could result in excessive total and/or differential settlement of the structure and/or trafficability issues. The following are considerations related to site preparation.

5.5.2. Subgrade Preparation

Any organic soils (rootmat), weak or loose soil, and weathered till should be stripped and removed to expose competent native till prior to placement of engineered fill or foundation elements. The subgrade should be proof rolled with a 10 tonne vibratory roller and all weak/loose soil must be completely removed and replaced with engineered fill. The stripping operations and foundation surface inspection should be supervised by qualified geotechnical personnel.

Native undisturbed till will be exposed on the surface after stripping all organic soil and weathered till. In dry areas, it is expected that the exposed surface will be favourable for the mobility of construction equipment.

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5.5.3. Site Grading

Engineered fill will be required to bring the southern side of the site to design subgrade elevation. Engineered fill will be placed after stripping all topsoil, any soil containing excessive organics and other unsuitable soil, within an area extending at least 2.5 m beyond the perimeter of the footprint of the proposed site.

Engineered fill should be a well graded sand and gravel or a high quality blast rock fill. The maximum allowable particle diameter should be 150 mm subject to engineering approval. All engineered fill shall be approved by geotechnical personnel and placed and compacted under controlled conditions using the following procedures::

- I. The area extent of engineered fill should be controlled by proper surveying techniques to ensure that the top of the engineered fill extends a minimum of 2.5 m beyond the perimeter of the structures to be supported. A maximum slope of 1V:1H (45°) constructed from engineered fill is to be maintained outside of this 2.5 m perimeter. This slope should not be confused with permanent exposed slopes which should be 1V:2H or flatter.
- II. The area to receive the engineered fill should be stripped of any topsoil, organic matter, fill and other compressible, weak and deleterious materials. After stripping, the entire area should be inspected and approved by geotechnical personnel. Spongy, wet or soft/loose spots should be sub-excavated to stable subgrade and replaced with compactable approved soil, compatible with subgrade conditions, as directed by geotechnical personnel.
- III. The fill material should be placed in thin layers ranging from 200 mm to 300 mm in thickness, depending on the compaction equipment used. Oversize particles (cobbles and boulders) larger than 150 mm should be discarded, and each fill layer should be uniformly compacted with heavy compactors, suitable for the type of fill used. Under foundations fill should be compacted to at least 100 percent of its Standard Proctor Maximum Dry Density (SPMDD), while under roadways and the general yard area the fill should be compacted to at least 98 percent of its Standard Proctor Maximum Dry Density (SPMDD).
- IV. Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are necessary for the construction of a certifiable engineered fill and compaction procedure and efficiency should be closely monitored by geotechnical personnel.
- V. The engineered fill should not be frozen and should be placed at moisture content within 2 percent of the optimum value for compaction. The engineered fill should

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not be placed during winter months when freezing ambient temperatures occur persistently or intermittently.

The excavated glacial till may be used as engineered fill however, it may require moisture conditioning. If the onsite sand and gravel till contains excessive fine grained material (>20%), it may be mixed with blast rock fill prior to use for engineered fill. If the onsite sand and gravel till contains excessive fine grained material (>20%), it may be mixed with blast rock fill prior to use for engineered fill. All materials to be used as engineered fill should be approved by geotechnical personnel prior to placement.

5.5.4. Excavation and Construction Dewatering

It is expected that excavations will be required for the foundation elements and for any buried infrastructure. Conventional unsupported excavations are expected to be feasible where the groundwater table is below the bottom of the excavation. All excavations should be carried out in accordance with applicable occupational health and safety rules and regulations including, but not limited to, Sections 404 to 416 of the Newfoundland and Labrador Occupational Health and Safety Regulations.

Temporary unsupported excavations above the groundwater table and no more than 1.0 m deep should be sloped no steeper than 1H:1V (Horizontal:Vertical; H:V). Flatter slopes will likely be required if weak soil layers are encountered during the excavation. Unsupported excavation below the groundwater table or excavation deeper than 1.0 m should be analyzed on a case-by-case basis. The stability of supported excavations should also be evaluated on a case-by-case basis, should they be required.

Groundwater levels recorded during the excavation of the test pits indicate a groundwater surface between 1.0 m to 7.5 m below ground surface

Stockpiles of materials and excavated soil should be placed away from the crest of excavations by a distance equal to at least one half of the depth of the excavation or 2.0 m, whichever is greater

5.5.5. Foundations

Conventional spread or strip footings are considered a feasible foundation system for the structures at this site. Other possible foundation alternatives are not considered feasible for the following reasons:

- Steel piles – abundance of boulders in till will make pile driving difficult
- Screw piles - abundance of boulders, cobbles in till will cause damage to pile flights;
- Concrete caisson – casing will be required in areas of shallow groundwater and drilling of pile holes will be difficult due to boulders in till.

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Footings may be founded on the native, compact to dense undisturbed glacial till, engineered fill or bedrock. Foundations based on the native sand and gravel till, and/or a maximum of 1.0 m of engineered fill, overlying undisturbed glacial till (prepared in accordance with Section 5.2) the bearing capacity is as follows:

- Spread Footing: Minimum 1.0 m wide

Factored Geotechnical Resistance at ULS	375 kPa
Geotechnical Resistance at SLS	250 kPa

Foundations based on the engineered fill thicknesses greater than 1.0 m, the bearing capacity is as follows:

- Spread Footing: Minimum 1.0 m wide

Factored Geotechnical Resistance at ULS	225 kPa
Geotechnical Resistance at SLS	150 kPa

Due to large foundation loads or required significant embedment depth such that foundations are required to be supported on the underlying bedrock, the following bearing capacities should be used:

- Spread Footing: Minimum 1.0 m wide

Factored Geotechnical Resistance at ULS	1000 kPa
Geotechnical Resistance at SLS	650 kPa

The bedrock surface should be cleaned of loose, weathered rock and other deleterious materials. The quality of the bedrock could not be determined from the test pits or bedrock probing; therefore, inspection of the bedrock surface by qualified geotechnical personnel is recommended to confirm the bearing capacity can be achieved.

During construction, the footing subgrade should be reviewed by qualified geotechnical personnel to confirm that the underlying soil has adequate bearing capacity. Similarly, the placement and compaction of engineered fill for foundations should be conducted under the supervision of a qualified geotechnical personnel. If any weak materials, such as loose pockets of soil, are encountered during construction, these materials should be completely removed and replaced with engineered fill and compacted to 100 percent of Standard Proctor maximum dry density (SPMDD).

The footing subgrade should be protected at all times from rain, snow, freezing temperatures and the ingress of free water. Concrete should not be placed on frozen soil, nor should the soil beneath the footing be allowed to freeze after construction of the footing

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The maximum frost penetration calculated for this location is 3.5 m. For frost protection, a minimum of 3.5 m of soil cover, or its thermal equivalent must be maintained around footings.

Settlements of shallow spread footings will vary depending on the magnitude of load, load distribution, depth and size of footing and subgrade soil/rock type(s). However, if the recommendations of this report are adhered to, it is expected that settlements associated with the geotechnical resistances at SLS provided above would be in the order of 25 mm total and 15 mm differential, for well prepared bearing surfaces. Foundations based on sound bedrock will have negligible settlement.

It should be noted that the SLS and ULS values provided, together with settlements, are intended for preliminary sizing of foundations. If accurate values are required, detail foundation analysis should be carried out by considering the foundation subgrade conditions, foundation sizes and loadings. In areas of deep fills, creep settlement of the placed fill may pose additional total and differential settlement. Typical creep settlement for fill placed in accordance with Section 5.5.3 is 5 mm \pm 2 mm for every 1 m of fill thickness.

Construction difficulties might arise if a shallow groundwater table is encountered. Temporary dewatering discussed in Section 5.5.4 will be required for footings constructed below the groundwater table.

5.5.6. Lateral Earth Pressures

Foundation will be required to resist lateral earth pressures. Table 5-2 below provides the recommended earth pressure coefficients for the active, passive and “at rest” earth pressure cases for various soil types, as well as the total unit weights.

The earth pressure coefficients in Table 5-2 are based on the Rankine theory and do not include wall friction angles in the calculations. Inclusion of the wall friction angles in the calculation of passive coefficients is not recommended. Since large lateral displacements are required to mobilize the full passive resistance, the passive earth pressure coefficients include a Factor of Safety of 1.5.

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Table 5.4: Earth Pressure Coefficient, Soil Unit Weights and Wall Friction Angles

Soil Type	Active Pressure Coefficient K_a	“At Rest” Earth Pressure Coefficient K_o	Passive Pressure Coefficient K_p	Total Soil Unit Weight kN/m^3	Friction Angle Between Soil and Concrete
Engineered Granular Fill	0.33	0.50	3.0	21.0	22
Native Sand and Gravel Till	0.30	0.47	3.0	21.0	24

5.5.7. Slab-on-Grade

Grade-supported concrete floor slabs should be constructed on a prepared subgrade as recommended. Based on proposed grades, the slab subgrade will be engineered fill and /or native till. Prior to placement of concrete, the entire area should be proof rolled using a 10 tonne vibratory roller and observed by a qualified AMEC representative.

A minimum of 100 mm of free-draining, clean, washed, crushed gravel should be provided beneath all floor slabs. Should elevations be such that floor slabs are below the exterior finished grade, a properly designed and installed weeping tile drainage system is required. Install a damp-proofing membrane under concrete slabs-on-grade. Based on design grades and groundwater levels encountered, a permanent subdrainage system may not be required. However if the design grade should change then this requirement should be re-analyzed.

The recommended live load on the slab-on-grade is up to 20 kPa. Higher live load on slab-on-grade should be designed as a mat foundation by considering the soil conditions underlying the mat foundation and its impact on any adjacent foundations. All slabs should be structurally independent from walls and columns supported on foundations. Should heavy, concentrated loads be expected near the perimeter of slabs, thickened and reinforced slab edges should be structurally designed accordingly. This will reduce any structural distress that may occur as a result of differential soil movements.

The amount of relative movement and differential settlement within the slabs will vary depending on the soil conditions below the slab and the magnitude of the load supported by the slab. To calculate the amount of slab movement due to the live load, the soil may be modeled as linear springs based on the modulus of subgrade reaction (MSR) or similar analytical methods. A MSR of 20 MPa/m can be used for the engineered fill and 25 MPa/m if the slab subgrade is the native sand and gravel till.

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If the calculated differential movements are considered intolerable, then an alternative slab support system such as dowelled joints in the slab-on-grade, a structural slab supported by foundations or mat foundations should be considered.

The excavated subgrade beneath slabs-on-grade should be protected at all times from rain, snow, freezing temperatures, excessive drying and the ingress of free water.

5.5.8. Seismic Design Parameters

In conformance to the criteria in Table 4.1.8.4A, Part 4, Division B of the National Building Code (NBC 2010), the site is classified as either Site Class “B - Rock” for sound bedrock, “C - Very Dense Soil” for very dense unweathered sand and gravel till and fractured bedrock, or Site Class “D – Stiff Soil” for compact and dense unweathered sand and gravel till/fill. The four values of the Spectral response acceleration $S_a(T)$ for different periods and the Peak Ground Acceleration (PGA) can be obtained from Table C-2 in Appendix C, Division B of the NBC (2010). The design values of F_a and F_v for the project site should be calculated in accordance to Table 4.1.8.4 B and C.

5.5.9. Rock Anchors

Rock anchors may be required for shallow foundations based on bedrock near the grade elevation. For anchor design purposes the following empirical parameters may be used:

• Dry unit weight of undisturbed bedrock	28 kN/m ³
• Specific gravity of bedrock	2.5
• Angle of internal of friction (undisturbed bedrock)	40°
• Assumed apex angle	90°
• Unconfined Compressive Strength of Intact Bedrock	100 MPa
• Estimated RQD	75-90%
• Minimum Depth of Embedment	3.0 metres

Mechanical anchors are feasible for this based on the excellent quality of the bedrock encountered. Long sleeves are recommended and an allowance provided for grout anchors in the event that a poorer quality rock is encountered at depth and the test load cannot be maintained. If more than one rock anchor is to be use for a particular foundation element then group effects need to be considered. Corrosion protection should be provided for the anchors.

5.5.10. Access Road

The proposed access road into the substation site will be over bedrock outcrops with sporadic overlying till areas. It is anticipated the some blasting will be required. The till encountered along the access road right-a-way and at the station site may be used in the preparation of the sub-grade provided it is moisture conditioned ($\pm 2\%$ of optimum),

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removed of boulders, and compacted to 98% standard proctor maximum dry density (SPMDD). Additional rock fill may be required in areas where the insitu soil is saturated and soft.

The rock fill shall consist of hard durable rock particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials. The following gradation limits are recommended:

Sieve Size	% Passing
200 mm	100
100 mm	75-100
25 mm	50-80
4.76	20-55
1.2	10-35
0.3	5-20
0.075	<8

The following specifications are recommended for rock fill placement:

- Place and compact rock fill in continuous horizontal layers not exceeding 300 mm loose and compacted using a 10 tonne vibratory roller utilizing a minimum of 8 passes in each direction;
- The extent of the rock fill to be controlled by proper surveying techniques;
- After stripping and rough grading using onsite till, the sub-grade shall be visually inspected by AMEC to assist in identifying and addressing any soft areas prior to placement of rock fill;
- Oversized particles (cobbles and boulders) larger than 200 mm should be discarded and each fill layer should be uniformly compacted to 100% of its Standard Proctor Maximum Dry Density (SPMDD) within the roadway. Field density testing by visual inspection during proof rolling by experienced geotechnical personnel is required;
- Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are recommended; and,

The gradation of the road gravel surfacing is recommended to be in accordance with the Department of Transportation and Works, Maintenance Grade 2 specification, and compacted to 100% SPMDD. The thickness of the road gravel should be 300 mm. The road gravel shall consist of hard durable rock particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials. The following gradation limits are recommended:

Sieve Size	% Passing
25 mm	100
9.5 mm	55-80

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4.76	35-60
1.2	15-35
0.3	5-20
0.075	3-10

5.5.11. Water Wells

No published hydrogeological reports were found or reviewed for the substation at Churchill Falls. Geological maps show that the underlying rocks are felsic (granite) to intermediate (diorite) crystalline igneous intrusive rocks. Occasional mafic (gabbro) intrusive rocks are also found in the area.

6.0 FORTEAU POINT

Proposed infrastructure associated with the Forteau Point Transition Compound includes:

- Control and utility buildings (single storey, pre-engineered metal);
- Gantry or A - Frame dead end towers; and
- Switchyard light frame structures.

A total of seven (7) test pit locations were initially proposed by Nalcor. However, accessibility issues limited the geotechnical investigation to bedrock probing.

It was also communicated to AMEC that a revised location was situated approximately 500 m west upon completion of the field program. Thick brush at the revised site and the unavailability of wood cutting services created difficult working conditions. Therefore, the geotechnical investigation could not be performed at the revised site.

The fieldwork was performed from June 11 to June 14, 2012. A total 37 bedrock probes were carried out at the original location. Additional field support was supplied by laborers from C&T Enterprises Limited.

6.1. Site Description

Forteau Point is situated on the south coast of Labrador, on the west side of Forteau Bay and is approximately 6 km southwest of Point Amour. The site is remote and is accessible by the existing all terrain vehicle (ATV) trails that leads from Route 510 and on foot along the Overfalls Brook Hiking Trail.

6.2. Site Geology

6.2.1. Bedrock Geology

Bedrock is exposed as a series of low ridges that generally parallel the coastline. The rock is limestone at the new compound location. It tends to weather chemically forming a

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thin layer of soil, generally less than one (1) thick, comprising bedrock fragments and organic material. Although no karst topography was identified at this site, the presence of dry ponds and lakes with significantly low water level exists nearby. A fault line is located approximately 500 m from the site. This feature is interpreted by the geological reports to be in the order of several hundreds of millions years old and is not active.

6.2.2. Surficial Geology

Drawing 5 in Appendix A shows the general surficial geology of the proposed new Transition Compound location and the TC-6 location as proposed on May 2, 2012. The area has been glaciated as evident to the rounded hills and U-shaped valleys that exist in the area. The ice suppressed the surface of the land to about 130 m below sea level. As the land rose, any deposits of till and erodible bedrock were wave washed forming a series of raised beaches through the Forteau Point area. These raised beaches are more prevalent in the flatter areas while any steeper areas were generally washed down to the bedrock surface.

6.3. Bedrock Probing

Results of the bedrock probing program carried out at the original location proposed for the Forteau Point Transition Compound are presented in Table 6-1. These are presented for reporting purposes only. Probe locations were selected in the field by AMEC. The probes were advanced in a gridded pattern in an attempt to delineate bedrock depth across the site. Refer to the Drawing 5 (Appendix A3) for the test locations.

Table 6.1: Summary of Bedrock Probing Results – Forteau Point Site

Bedrock Probe ID	Northing ²	Easting ²	Refusal Depth (mbgs ¹)	Comments
BP-01	5698217	503312	1.1	Probe dry
BP-02	5698229	503299	>1.8	Frost encountered at 0.3 m.
BP-03	5698229	503272	1.8	Probe dry
BP-04	5698233	503248	1.6	Probe dry
BP-05	5698254	503231	1.8	Probe dry
BP-06	5698262	503221	>1.8	Probe dry
BP-07	5698278	503195	1.5	Probe dry
BP-08	5698287	503176	1.0	Cobble / boulder encountered at 0.6 m.
BP-09	5698302	503149	1.1	Probe dry
BP-10	5698268	503288	>1.8	Probe dry
BP-11	5698275	503269	>1.8	Probe dry
BP-12	5698286	503245	>1.8	Probe dry
BP-13	5698305	503228	1.0	Probe dry
BP-14	5698324	503207	1.4	Probe dry
BP-15	5698338	503188	1.4	Probe dry

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Bedrock Probe ID	Northing ²	Easting ²	Refusal Depth (mbgs ¹)	Comments
BP-16	5698265	503129	1.3	Probe dry
BP-17	5698254	503129	1.4	Probe dry
BP-18	5698237	503152	>1.8	Probe dry
BP-19	5698223	503173	>1.8	Probe dry
BP-20	5698211	503194	1.7	Probe dry
BP-21	5698192	503216	0.9	Probe dry
BP-22	5698176	503236	>1.8	Probe dry
BP-23	5698161	503252	1.3	Probe dry
BP-24	5698123	503257	1.0 – 1.6	Boulders near test location. Refusal ranged from 1.0 to 1.6 m within 1.5 m radius.
BP-25	5698131	503232	>1.8	Probe dry
BP-26	5698140	503207	>1.8	Probe bent on retrieval. Probable cobbles / boulders.
BP-27	5698164	503184	1.3 – 1.8	Boulders near test location. Refusal ranged from 1.3 to 1.8 m within 1.5 m radius.
BP-28	5698181	503168	1.7	Probe bent on retrieval. Probable cobbles / boulders.
BP-29	5698200	503142	1.0	Probe dry
BP-30	5698220	503122	1.6	Probe dry
BP-31	5698227	503109	1.1	Probe dry
BP-32	5698195	503084	0.9	Probe dry
BP-33	5698181	503105	1.4	Probe dry
BP-34	5698160	503129	1.6	Probe dry
BP-35	5698148	503153	1.0	Probe dry
BP-36	5698113	503180	1.5	Probe dry
BP-37	5698088	503206	1.3	Probe dry

Notes: 1. mbgs = meters below existing ground surface

2. obtained with a hand held GPS unit – UTM, Zone 21, NAD 83

Apparent bedrock was encountered at 27 of the 37 probed locations at depths ranging from 0.8 mbgs to 1.8 mbgs. Apparent bedrock was not encountered at BP-02, BP-06, BP-10, BP-11, BP-12, BP-18, BP-19, BP-26 and BP-26 as the bedrock, if present, extended beyond the maximum penetration length probe (1.8 m).

6.4. Discussion and Recommendations

Due to the lack of field information at this proposed site the following discussions and recommendations should be classed as preliminary. The recommended are based on data from the original location and knowledge gained through other Nalcor work that AMEC has performed in the general area. During construction, an AMEC geotechnical engineer/geologist must visited the site to confirm the recommendations given below.

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The majority of the revised site will be underlain by weathered limestone bedrock. Based on the results of the available interpreted information, the subsurface conditions encountered at the Site are suitable to support the proposed structures, using the site preparation and recommendations discussed in the following sections.

The recommendations provided are based drawings and information provided in the project RFP. Below are the structures that will be located at the Shoal Cove Substation:

- Control and Utility Buildings (single story, pre-engineered metal structure);
- Gantry or A Frame Dead End Towers; and,

6.4.1. Site Preparation

Proper surface drainage is essential in order to reduce the potential for excess moisture penetration below foundation elements and grade-supported slabs. Site grading should provide positive drainage away from the structures

Conventional earthwork equipment is anticipated to be capable of removing, replacing and re-compacting most of the granular materials. Blasting and/or excavators equipped with impact hammers will likely be required for removing bedrock or large boulders if encountered in excavations above the design grade.

Improper site preparation could result in excessive total and/or differential settlement of the structure and/or trafficability issues. The following are considerations related to site preparation.

6.4.2. Subgrade Preparation

Any organic soils (rootlets), peat, and loose bedrock fragments should be stripped and removed to expose bedrock prior to placement of engineered fill or foundation elements. These soils are generally weak and will deform excessively under load. The stripping operations and foundation surface inspection should be supervised by qualified geotechnical personnel.

6.4.3. Fill for Site Grading

Engineered fill will be required to bring the site to design subgrade elevation. Engineered fill will be placed after stripping all topsoil, any soil containing excessive organics and other unsuitable soil, within an area extending at least 2.5 m beyond the perimeter of the footprint of the proposed site.

Engineered fill shall be a well graded, high quality blast rock fill and/or a mixture of blast rock and raised beach material. The maximum allowable particle diameter is 100 mm, with a maximum fines (minus 0.075 mm) content of 8 percent and approved by the

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geotechnical engineer prior to placing the formwork. All engineered fill shall be placed and compacted under controlled conditions using procedures such as the following:

- I. The area extent of engineered fill should be controlled by proper surveying techniques to ensure that the top of the engineered fill extends a minimum of 2.5 m beyond the perimeter of the structures to be supported. A maximum slope of 1V:1H (45°) constructed from engineered fill is to be maintained outside of this 2.5 m perimeter. This slope should not be confused with any embankment slopes which should be 1V:2H or flatter.
- II. The area to receive the engineered fill should be stripped of any topsoil, organic matter, fill, sediment and other compressible, weak and deleterious materials. After stripping, the entire area should be inspected and approved by the Geotechnical Engineer. Spongy, wet or soft/loose spots should be sub-excavated to stable subgrade and replaced with compactable approved soil, compatible with subgrade conditions, as directed by the Geotechnical Engineer.
- III. The fill material should be placed in thin layers ranging from 200 mm to 300 mm in loose thickness, depending on the compaction equipment used. Oversize particles (cobbles and boulders) larger than 100 mm should be discarded, and each fill layer should be uniformly compacted with heavy compactors, suitable for the type of fill used. Under foundations fill should be compacted to at least 100 percent of its Standard Proctor Maximum Dry Density (SPMDD), while under roadways and the general yard area the fill should be compacted to at least 98 percent of its Standard Proctor Maximum Dry Density (SPMDD),.
- IV. Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are necessary for the construction of a certifiable engineered fill and compaction procedure and efficiency should be closely monitored by the Geotechnical Engineer.
- V. The engineered fill should not be frozen and should be placed at moisture content within 2 percent of the optimum value for compaction. The engineered fill should not be placed during winter months when freezing ambient temperatures occur persistently or intermittently.

It is anticipated that imported material from local pits or blast rock fill from on site bedrock can be used for engineered fill. The onsite overburden soils are not suitable for use as engineered fill.

6.4.4. Excavation and Construction Dewatering

It is expected that excavations will be required for the foundation elements and for any buried infrastructure. Conventional unsupported excavations are expected to be feasible

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where the groundwater table is below the bottom of the excavation. All excavations should be carried out in accordance with applicable occupational health and safety rules and regulations including, but not limited to, Sections 139 to 143 of the Newfoundland and Labrador Occupational Health and Safety Regulations.

Temporary unsupported excavations above the groundwater table and no more than 1.0 m deep should be sloped no steeper than 1H:1V (Horizontal:Vertical; H:V). Flatter slopes will likely be required if weak soil layers are encountered during the excavation. Unsupported excavation below the groundwater table or excavation deeper than 1.0 m should be analyzed on a case-by-case basis. The stability of supported excavations should also be evaluated on a case-by-case basis, should they be required.

Stockpiles of materials and excavated soil should be placed away from the crest of excavations by a distance equal to at least one half of the depth of the excavation or 2.0 m, whichever is greater.

6.4.5. Foundations

Conventional spread or strip footings are considered a feasible foundation system for the structures at this site. Other possible foundation alternatives (screw piles, steel piles, and concrete caissons) are not considered feasible due to the shallow depth to bedrock (<2m):

Footings may be founded on engineered fill or bedrock. Foundations based on a maximum of 1.0 m of engineered fill founded on bedrock, the bearing capacity is as follows:

Spread Footing: 1.2 m deep and minimum 1.0 m wide	
Factored Geotechnical Resistance at ULS	375 kPa
Geotechnical Resistance at SLS	250 kPa

Foundations based on the engineered fill with thicknesses greater than 1.0 m, the bearing capacity is as follows:

Spread Footing: 1.2 m deep and minimum 1.0 m wide	
Factored Geotechnical Resistance at ULS	275 kPa
Geotechnical Resistance at SLS	150 kPa

If large foundation loads or significant embedment depth of foundations are required to be supported on the underlying bedrock, the following bearing capacities should be used:

Spread Footing: 1.2 m deep and minimum 1.0 m wide

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Factored Geotechnical Resistance at ULS	1000 kPa
Geotechnical Resistance at SLS	650 kPa

The bedrock surface should be cleaned of loose, weathered rock and other deleterious materials. The quality of the bedrock was not determined; therefore, inspection of the bedrock surface by qualified geotechnical personnel is recommended to confirm the bearing capacity can be achieved.

During construction, the footing subgrade should be reviewed by qualified geotechnical personnel to confirm adequate bearing capacity. Similarly, the placement and compaction of engineered fill for foundations should be conducted under the supervision of qualified geotechnical personnel. If any weak materials, such as loose pockets of soil, are encountered during construction, these materials should be completely removed and replaced with engineered fill and compacted to 100 percent of Standard Proctor maximum dry density (SPMDD).

The footing subgrade should be protected at all times from rain, snow, freezing temperatures and the ingress of free water. Concrete should not be placed on frozen soil, nor should the soil beneath the footing be allowed to freeze after construction of the footing.

The maximum frost penetration calculated for this location is 3.0 m. For frost protection, a minimum of 3.0 m of soil cover, or its thermal equivalent must be maintained around footings.

Settlements of shallow spread footings will vary depending on the magnitude of load, load distribution, depth and size of footing and subgrade soil/rock type(s). However, if the recommendations of this report are adhered to, it is expected that settlements associated with the geotechnical resistances at SLS provided above would be in the order of 25 mm total and 15 mm differential, for well prepared bearing surfaces. Foundations based on sound bedrock will have negligible settlement.

It should be noted that the SLS and ULS values provided, together with settlements, are intended for preliminary sizing of foundations. If accurate values are required, detail foundation analysis should be carried out by considering the foundation subgrade conditions, foundation sizes and loadings. In areas of deep fills, creep settlement of the placed fill may pose additional total and differential settlement. Typical creep settlement for fill placed in accordance with Section 6.4.3 is 5 mm \pm 2 mm for every 1 m of fill thickness.

Construction difficulties might arise if a shallow groundwater table is encountered. Temporary dewatering discussed in Section 6.4.4 will be required for footings constructed below the groundwater table.

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During construction, footing subgrade should be reviewed by qualified geotechnical personnel to confirm that the underlying soil has adequate bearing capacity. If any weak materials, such as loose silty sand and/or loose sand, are encountered during construction, these materials should be completely removed and replaced with engineered fill and compacted to 100 percent of SPMDD.

6.4.6. Lateral Earth Pressures

Foundation will be required to resist lateral earth pressures. Table 6-2 below provides the recommended earth pressure coefficients for the active, passive and “at rest” earth pressure cases for various soil types, as well as the total unit weights.

The earth pressure coefficients in Table 6-2 are based on the Rankine theory and do not include wall friction angles in the calculations. Inclusion of the wall friction angles in the calculation of passive coefficients is not recommended. Since large lateral displacements are required to mobilize the full passive resistance, the passive earth pressure coefficients include a Factor of Safety of 1.5.

Table 6.2: Earth Pressure Coefficient, Soil Unit Weights and Wall Friction Angles

Soil Type	Active Pressure Coefficient K_a	“At Rest” Earth Pressure Coefficient K_o	Passive Pressure Coefficient K_p	Total Soil Unit Weight kN/m^3	Friction Angle Between Soil and Concrete
Engineered Granular Fill	0.33	0.50	3.0	21.0	24

6.4.7. Slab-on-Grade

Grade-supported concrete floor slabs should be constructed on a prepared subgrade as recommended. Based on proposed grades, the slab subgrade will be engineered fill. Prior to placement of concrete, the entire area should be proof rolled using a 10 tonne vibratory roller and observed by qualified geotechnical personnel.

A minimum of 100 mm of clean, washed, crushed gravel should be provided beneath all floor slabs. Should elevations be such that floor slabs are below the exterior finished grade, a properly designed and installed weeping tile drainage system will be required. Install a damp-proofing membrane under concrete slabs-on-grade. Based on design grades and groundwater levels encountered, a permanent sub-drainage system may not be required. However if the design grade should change then this requirement should be re-analyzed.

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The recommended live load on the slab-on-grade is up to 20 kPa. Higher live load on slab-on-grade should be designed as a mat foundation by considering the soil conditions underlying the mat foundation and its impact on any adjacent foundations. All slabs should be structurally independent from walls and columns supported on foundations. Should heavy, concentrated loads be expected near the perimeter of slabs, thickened and reinforced slab edges should be structurally designed accordingly. This will reduce any structural distress that may occur as a result of differential soil movements.

The amount of relative movement and differential settlement within the slabs, will vary depending on the soil conditions below the slab and the magnitude of the load supported by the slab. To calculate the amount of slab movement due to the live load, the soil may be modeled as linear springs based on the modulus of subgrade reaction (MSR) or similar analytical methods. A MSR of 20 MPa/m can be used for the engineered fill.

If the calculated differential movements are considered intolerable, then an alternative slab support system such as dowelled joints in the slab-on-grade, a structural slab supported by foundations or mat foundations should be considered.

The excavated subgrade beneath slabs-on-grade should be protected at all times from rain, snow, freezing temperatures, excessive drying and the ingress of free water.

6.4.8. Seismic Design Parameters

In conformance to the criteria in Table 4.1.8.4A, Part 4, Division B of the National Building Code (NBC 2010), the site is classified as either Site Class “B - Rock” for sound bedrock or “C - Very Dense Soil” for very dense unweathered sand and gravel till and fractured bedrock. The four values of the Spectral response acceleration $S_a(T)$ for different periods and the Peak Ground Acceleration (PGA) can be obtained from Table C-2 in Appendix C, Division B of the NBC (2010). The design values of F_a and F_v for the project site should be calculated in accordance to Table 4.1.8.4 B and C.

6.4.9. Rock Anchors

Rock anchors may be required for shallow foundations based on bedrock near the grade elevation. For anchor design purposes the following empirical parameters may be used:

- | | |
|---|------------------------|
| • Dry unit weight of undisturbed bedrock | 26.5 kN/m ³ |
| • Specific gravity of bedrock | 2.6 |
| • Angle of internal of friction (undisturbed bedrock) | 40° |
| • Assumed apex angle | 90° |
| • Unconfined Compressive Strength of Intact Bedrock | 100 MPa |
| • Estimated RQD | 70% |
| • Minimum Depth of Embedment | 3.0 metres |

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Mechanical anchors are feasible for this site based on the excellent quality of the bedrock encountered. Long sleeves are recommended and an allowance provided for grout anchors in the event that a poorer quality rock is encountered at depth and the test load cannot be maintained. If more than one rock anchor is to be used for a particular foundation element then group effects need to be considered. Corrosion protection should be provided for the anchors.

The contractor must excavate to solid, un-weathered rock before drilling any anchor holes. Prior to the placement or construction of the anchors/foundation, all surficial soils and any loose or weathered bedrock should be removed. Should differing conditions be encountered during installation, then those presented in this report, AMEC must be contacted to review these findings and determine if the published perimeters are applicable and revise accordingly.

6.4.10. Access Road

The proposed access road into the substation site will be over limestone bedrock terrain with occasional raised beach areas. It is anticipated that imported material or rock fill from on site bedrock will have to be used to prepare the road subgrade.

The rock fill shall consist of hard durable rock particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials. The following gradation limits are recommended:

Sieve Size	% Passing
200 mm	100
100 mm	75-100
25 mm	50-80
4.76	20-55
1.2	10-35
0.3	5-20
0.075	<8

The following specifications are recommended for rock fill placement:

- Place and compact rock fill in continuous horizontal layers not exceeding 300 mm loose and compacted using a 10 tonne vibratory roller utilizing a minimum of 8 passes in each direction;
- The extent of the rock fill to be controlled by proper surveying techniques;
- After stripping and rough grading using onsite till, the sub-grade shall be visually inspected by AMEC to assist in identifying and addressing any soft areas prior to placement of rock fill;

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- Oversized particles (cobbles and boulders) larger than 200 mm should be discarded and each fill layer should be uniformly compacted to 100% of its Standard Proctor Maximum Dry Density (SPMDD) within the roadway. Field density testing by visual inspection during proof rolling by experienced geotechnical personnel is required;
- Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are recommended; and,

The gradation of the road gravel surfacing is recommended to be in accordance with the Department of Transportation and Works, Maintenance Grade 2 specification, and compacted to 100% SPMDD. The thickness of the road gravel should be 300 mm. The road gravel shall consist of hard durable rock particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials. The following gradation limits are recommended:

Sieve Size	% Passing
25 mm	100
9.5 mm	55-80
4.76	35-60
1.2	15-35
0.3	5-20
0.075	3-10

6.4.11. Water Wells

No published hydrogeological reports were found or reviewed for Forteau Point. A drilled water well at the proposed location of the Transition Compound would likely have its first several metres in the Forteau Formation limestone. The bulk of the well would be in the Brador sandstone. Geotechnical drilling during the winter of 2012 at a nearby location showed that, permeability in the Brador Formation, the calculated geometric mean of hydraulic conductivity ranged from 5×10^{-6} cm/s to 2×10^{-4} cm/s. This indicates that the rock can be tight, with low producing wells of 4 l/min, or moderate with average production of about 25 l/min.

7.0 L'ANSE-AU-DIABLE

7.1. Site Description

The following site description is extracted from AMEC Report No TF1010482 (WTO-1501) entitled "Gull Island, HVDC Shoreline pond Electrode, Site Selection, Strait of Belle Isle", which adequately covers the site and surrounding area. Also contained in that report, under Appendix E, are a series of photographs, with captions, taken from the air and ground. The Appendix E from that report is included as Appendix D in this report.

"This site is in a south facing cove with somewhat rectangular dimensions of 130 m to 150 m wide and length of approximately 150 m. The majority of the shoreline is exposed

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granite gneiss bedrock. A pancake shoal that is exposed at low tide exists at the east side of the entrance to the cove. A bedrock ridge that is probably awash at high tide exists near the west of centre of the cove that extends south for about 2/3 of the length of the cove. Sand has accumulated within the inner reaches of the cove and the shoreline north of the cove. Several raised beach strand lines are visible extending about 100 m north of the present day beach. The visibility through the water was excellent during the field visit. The bottom comprises a mix of exposed rock, sand and boulders. Water depth at the southwest, outside end of the cove was visibly estimated to be about 6 m deep adjacent to the cliff.

The area north of the beach area is generally wet with bog land developed containing small ponds. A small intermittent stream flows south to enter the beach area at about the centre of the cove. The water flowing from this stream disappeared into the beach sand.

A quarry is developed in the hillside about 200 m north of the cove. A drainage ditch has been dug from this quarry and leads southward to the beach area. The small volume of water from this ditch disappeared into the beach sand.

The rock in the vicinity of the cove in the lower elevations was close to very close jointed granite gneiss. Rock in the higher elevations was sub-horizontally, thin to massive bedded limestone and shale.

There are four quarries and a borrow pit located within 1 kilometre of the site. Three of the quarries are in granite gneiss rock show signs of recent activity while the third one is in limestone/shale and is overgrown with a thick growth of brush.”

7.2. Site Geology

The regional geology of the Strait of Belle Isle area has been studied extensively by various geologists over the years and recently summarized in reports commissioned by Nalcor. The following description is an excerpt from AMEC report TF10104105 (currently under review by Nalcor) entitled Geotechnical Site Investigation, Proposed Landfall Location, Forteau Point, Labrador, Contract: LC-SB-014. This report takes direct quotes from the earlier Nalcor reports.

“Much work has been done on the geology of the SOBI region. “The earliest work is credited to Richardson in 1860, who recognized and divided the Cambrian and Ordovician sedimentary rocks into lithostratigraphic units. These units were re-described by Schuchert and Dunbar (1934), with more recent contributions by Cooper (1937), Betz (1939), Baird (1956), Clifford and Baird (1962), Tuke (1966), Gillis (1966) Williams (1967) and Williams and Stevens (1969).” (Fugro, 2009).

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Recent regional onshore mapping on the Newfoundland side of the Strait was carried out by the Geological Survey Branch of the Newfoundland Department of Mines and Energy. This work was done by Knight (1977a,b; 1978; 1980a,b; 1983; 1985), Knight and Saltman (1980), and Knight and Boyce (1984). Geological mapping on the Labrador side of the Strait has been carried out by Gower at a scale of 1:50,000 (Fugro, 2009).

Bostock et al. (1983) also produced maps and regional stratigraphic and tectonic sequence of bedrock units on both sides of the SOBI. This work included a description of the boreholes at Point Amour and Yankee Point that were drilled by Newfoundland and Labrador Hydro as part of the analysis for a proposed bedrock tunnel across the Strait (Fugro, 2009)

In 2009, Fugro reviewed and summarized the work outlined above and also carried out reconnaissance mapping in the region. Their report, entitled “Descriptive Overview of Regional Geology Strait of Belle Isle” was submitted to NE in 2009 and also provided useful information pertaining to SOBI regional geology.

The oldest rocks in the area comprise mafic and felsic intrusive rocks and gneisses that outcrop along the coast with syn- and post- Grenvillian granitoid intrusions occurring further inland (Bostock et al. 1983).” (Fugro, 2009). The most recent mapping of the Basement Gneiss Complex along south eastern Labrador was completed by C.F. Gower in 2010. Based from his 2010 map “Geology of the Pinware Area”, the assemblages of the complex within the vicinity of Forteau Point range from a medium-to-coarse grained, recrystallized, weakly to foliated granite and alkali feldspar granite to a weakly foliated monzonite to quartz monzonite. Gower also noted a band of medium-to-coarse grained, recrystallized weakly to strongly foliated tonalite to granodiorite near Middle Pond, approximately 5 km northeast of Forteau Bay“ “.

Fault lines are visible on air photos of the general L’Anse au Diable area, however, no distinct faults were recognizable at the landfall sites.

7.3. Site Observations

A site walk over was performed on June 12, 2012 by an engineering geologist from AMEC. Nalcor had requested test pits at three (3) points near the landfall sections of the breakwater. Due to the presence of bedrock observed on air photos it was decided that a site traverse by an experienced engineering geologist be performed. However, due to the extremely high wind conditions at that time, access to some of those points was not safe to attempt. Photographs and rock quality data were obtained from two data points only. Due to the strong nature of the rocks in the area these characteristics are expected at the ends of the breakwater and extending beneath the surficial sediments and thin,

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organic root mat in the area. Refer to Drawing 6 in Appendix A4 for an aerial view of the study area and data point location.

7.3.1. Data Point 1

Data Point 1 was located on the west side of the cove. The rock at that location was pink to iron oxide stained brown, megacrystic granite gneiss with some bands containing garnet. The rock is strong with close to wide spaced jointing. The gneissic banding was somewhat wavy with general strike of due north and variable dip of 60° west to near vertical. Occasional thin pegmatite veins cut across the rock. The rock surface was generally smooth reflecting a glaciated surface. Occasional boulders dotted the surface.



Figure 7-1: Data Point 1, looking northeast towards the east short of the cove.

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Figure 7-2: Data Point 1 showing relatively smooth glaciated rock surface with occasional boulders. Brown surface staining is due to oxides of iron.

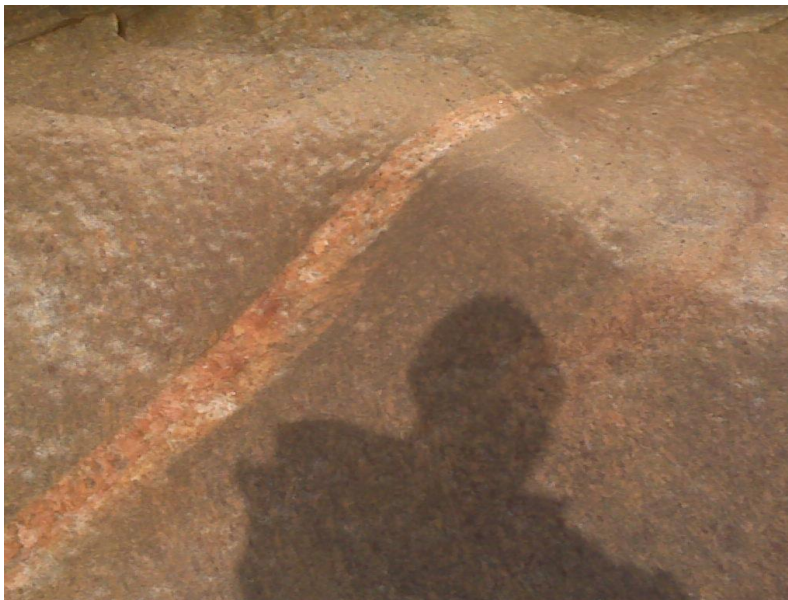


Figure 7-3: Data Point 1 showing thin pegmatite vein in granite gneiss.

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Figure 7-4: Data Point 1 showing the gneissic banding in the bedrock and close spaced near vertical jointing.

7.3.2. Data Point 2

Data Point 2 was located on the east side of the cove and contained similar rock to the west side. The rock at that location was pink to iron oxide stained brown, megacrystic granite gneiss. The rock is strong with close to wide spaced jointing. The gneissic banding was somewhat wavy with general strike of due north and variable dip of 60° west to near vertical. Many thick pegmatite veins cut across the rock. The rock surface was generally smooth reflecting a glaciated surface. Occasional boulders dotted the surface.

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Figure 7-5: Data Point 2 looking south and showing wide pegmatite vein striking north – south.



Figure 7-6: Data Point 2 showing granite gneiss with gneissic banding and one joint

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Figure 7-7: Data Point 2 showing parallel pegmatite veins.

7.4. Discussion and Recommendations

The marine sediments believed to exist under the proposed footprint of the breakwater were not investigated as part of this program.

The rock exposed at the landfall abutments of the proposed breakwater is strong granite gneiss with close to wide jointing and some pegmatite veins. For the purposes of foundation design the pegmatite is considered to be equal to the gneiss. The exposed rocks are very durable as evidenced by the glacial striae features still observable on the rock surface after what appears to be some 5,000 plus years of exposure to the elements.

The following estimated rock properties may be used for preliminary foundation design:

- | | |
|---|-------------------------|
| • Uniaxial Compressive Strength of rock with no fractures | >100 MPa |
| • Coefficient of Sliding Friction | 0.6 |
| • Angle of Internal Friction | 40° |
| • Density | 2,700 kg/m ³ |
| • Unit Weight | 26.5 kN/m ³ |
| • Porosity | 1.5% |

AMEC recommends that further geotechnical studies be performed on the marine sediments that appear to be present beneath 85% of the breakwater footprint. At that time bedrock cores should be taken to confirm the rock properties estimated above.

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8.0 SHOAL COVE

Proposed infrastructure associated with the Shoal Cove Transition Compound includes:

- Control and utility buildings (single storey, pre-engineered metal);
- Gantry or A - Frame dead end towers; and

Fieldwork for this site was performed from June 15 to June 16, 2012 and comprised of the excavation and logging of seven (7) test pit excavations, and eleven (11) percussion probes. Six (6) test pits were excavated with a Deere 80 C track-mounted excavator supplied by T & M Construction Limited. One (1) test pit was excavated manually. Wood clearing / cutting was not undertaken during this phase of the investigation, thereby limiting the excavator to areas of sparse tree cover. The percussion probes were advanced through overburden soils and terminated approximately 0.2 – 0.6 m into bedrock (where encountered) utilizing a gas powered Pionjar drill.

Initially, a total of seven (7) test pit locations were proposed by Nalcor. However, during mobilization to Shoal Cove, it was communicated to AMEC that a revised location was situated approximately 200 m north. Coordinates of the revised site corners and center point were then supplied by Nalcor, which became the focus of the investigation.

8.1. Site Description

The proposed location of the Shoal Cove Site is shown on Drawing 7 in Appendix A5. It is located approximately 200 m east of Route 430 and is accessible by ATV or on foot. Currently the site is vegetated with spruce and fir with some low lying areas of marsh and bog.

8.2. Site Geology

8.2.1. Bedrock Geology

Bedrock in the site area belongs to the Petit Jardin Formation, part of the Port Au Port Group. The Shoal Cove site lies specifically in the Lower Dolostone Member of the Petit Jardin Formation. It is described as thin bedded dolostones having interbedded green, grey and locally red dolomitic shale, and stromatolitic dolostone (C.M.T. Woodworth-Lynas, J.Y. Guigne and E.L. King, 1990).

8.2.2. Surficial Geology

Surficial geology in the Shoal Cove area consists of a wide range of sediment types, deposited in marine or glaciomarine environment; moderately well sorted gravel and sand is found in marine terraces and raised beaches. Well sorted clay and silt is found in raised ice-distal glaciomarine deposits. All these sediments have been raised to their present elevation by isostatic rebound, resulting in relative sea level fall following deglaciation (Liverman, D. and Taylor, D.M., 1994).

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8.3. Test Pit Excavations

In general, the soil profile consisted of marine sediment overlying limestone bedrock. Test pit depths ranged from 1.4 mbgs to 2.0 mbgs. All reported depths are relative to the existing ground surface.

Test pit locations are provided on Drawing 7 in Appendix A5. Descriptions of the stratigraphy encountered at the test pit locations are presented on the test pit logs compiled in Appendix B3. Also shown on the test pit logs are photographs of the test pit excavation and its spoilage. Refer to Table 8-1 for a summary of the test pit findings.

Table 8.1: Summary of Subsurface Conditions - Shoal Cove Site

Test Pit ID	Northing ²	Easting ²	Depth (mbgs ¹)			
			Marine Sediment ³	Bedrock	Groundwater	Test Pit Termination
TP-01	5690223	525583	0.6	1.9	1.9	1.9
TP-02	5690076	525584	0.9	1.4*	n/e ⁵	1.9
TP-03	5690217	525635	0.4	2.0	1.0	2.0
TP-04	5690262	525664	0.8	1.4	n/e	1.4
TP-05	5690249	525631	0.6	1.6	n/e	1.6
TP-06	5690159	525745	n/e	0.2*	n/e	1.4
TP-07	5690133	525606	0.3	1.4	n/e	1.4

- Notes:
1. mbgs = meters below existing ground surface
 2. obtained with a hand held GPS unit – UTM, Zone 21, NAD 83
 3. includes depth to unweathered marine sediment
 4. * = depth to fractured bedrock
 5. n/e = not encountered

Rootmat / Topsoil

Approximately 0.2 m to 0.3 m of organic material and organic rich soil was encountered at the surface of test pits TP-02, TP-03, TP-06 and TP-07. This material typically consisted of rootmat and a mixture of organic material and underlying soil. It was predominately loose, compressible and moist.

Peat

Peat was encountered at the surface of test pits TP-01, TP-04 and TP-05. Peat thickness ranged from 0.5 m to 0.6 m and was composed of rootlets, organic rich soil and bog. This material was loose, compressible and moist.

Weathered Marine Sediment

Weathered marine sediment was encountered in test pits TP-02, TP-03 and TP-04 underlying the rootmat / topsoil (TP-02 and TP-03) or peat (TP-04). Its composition ranged from a mixture of silt and sand with trace to some clay and gravel to a sand and

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gravel with some silt and trace clay. The soil was typically loose to compact, (classified as firm and slightly plastic with increased proportions of silt / clay), moist and light brown to grey. Its thickness ranged from 0.2 m to 0.6 m. Trace cobbles were also observed within this stratum in test pit TP-03.

Marine Sediment

With the exception of test pit TP-06, marine sediment was encountered in all test pits underlying the weathered layer (TP-02, TP-03 and TP-04), peat (TP-01 and TP-05) or rootmat / topsoil (TP-07). Its composition ranged from a clayey silt with some sand and gravel clay to a sand and gravel with some silt and trace clay. This soil was typically compact (classified as firm and slightly plastic with increased proportions of silt / clay), moist, grey and had a thickness ranging from 0.5 m to 1.5 m. Trace amounts of sea shells were observed in test pits TP-01 to TP-03. Trace to some cobbles and boulders were also observed in test pits TP-03 to TP-05 and TP-07.

Bedrock

Bedrock was encountered in all test pits at depths ranging from 0.2 mbgs (TP-06) to 2.0 mbgs (TP-03). Note that fractured bedrock was encountered in test pits:

- TP-02 (1.4 – 1.9 mbgs); and
- TP-06 (0.2 – 1.4 mbgs).

In test pit TP-02, angular pieces of limestone bedrock intermixed with sand, silt and gravel were excavated before refusal on sound bedrock; test pit TP-06 was terminated in fractured bedrock.

Groundwater

Groundwater was encountered in two (2) of the seven (7) test pits at depths ranging from 1.0 mbgs (TP-03) to 1.9 mbgs (TP-01). Pit walls were moist in test pits TP-04 and TP-05. At the time of the field investigation, it was anticipated that the groundwater was near its highest level. Its level is expected to slightly increase from those observed during the spring melt in March/April. Some seasonal variations in groundwater level should be anticipated.

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8.4. Percussion Drilling

Table 8-2 shows the results of the percussion drilling program carried out at Shoal Cove. Drill locations were selected in the field by AMEC in an attempt to delineate bedrock depth at the four (4) corners of the site. Refer to the Drawing 7 (Appendix A5) for the test locations.

Table 8.2: Summary of Percussion Drilling Results - Shoal Cove Site

Probe ID	Northing ²	Easting ²	Interval (mbgs ¹)	Interpreted Soil Conditions	Comments
PD-01	5690213	525590	0.0 – 0.5	Peat / Organic Soil	Easy drilling
			0.5 – 1.8	Marine Sediment	Residual grey marine soil evident on drill steels
PD-02	5690223	525583	0.0 – 1.1	Organic Rich Soil	Easy Drilling
			1.1 – 1.4	Marine Sediment	Residual grey marine soil evident on drill steels
			1.4 – 1.8	Bedrock	Hard drilling; grey cuttings
PD-03	5690233	525588	0.0 – 0.7	Peat / Organic Soil	Easy drilling
			0.7 – 1.8	Marine Sediment	Residual grey marine soil evident on drill steels
PD-04	5690222	525599	0.0 – 1.8	Marine Sediment	Residual brown - grey marine soil evident on drill steels.
PD-05	5690193	525604	0.0 – 1.6	Marine Sediment	Residual brown - grey marine soil evident on drill steels
			1.6 – 1.8	Bedrock	Hard drilling; grey cuttings
PD-06	5690181	525592	0.0 – 0.6	Organic Rich Soil	Easy drilling
			0.6 – 1.2	Bedrock	Hard drilling; grey cuttings
PD-07	5690176	525586	0.0 – 0.5	Organic Rich Soil	Easy drilling
			0.5 – 0.8	Marine Sediment	Residual brown - grey marine soil evident on drill steels
			0.8 – 1.3	Bedrock	Hard drilling; grey cuttings
PD-08	5690133	525606	0.0 – 0.3	Peat / Organic Soil	Easy drilling
			0.3 – 1.4	Marine Sediment	Residual brown - grey marine soil evident on drill steels
			1.4 – 1.8	Bedrock	Hard drilling; grey cuttings
PD-09	5690176	525719	0.0 – 0.2	Peat / Organic Soil	Easy drilling
			0.2 – 1.2	Marine Sediment	Residual brown - grey marine soil evident on drill steels

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Probe ID	Northing ²	Easting ²	Interval (mbgs ¹)	Interpreted Soil Conditions	Comments
			1.2 – 1.8	Bedrock	Hard drilling; grey cuttings
PD-10	5690176	525717	0.0 – 0.1	Peat / Organic Soil	Easy drilling
			0.1 – 1.0	Marine Sediment	Residual brown - grey marine soil evident on drill steels
			1.0 – 1.2	Bedrock	Hard drilling; grey cuttings
PD-11	5690180	525703	0.0 – 0.1	Peat / Organic Soil	Easy drilling
			0.1 – 1.4	Marine Sediment	Residual brown - grey marine soil evident on drill steels
			1.4 – 1.8	Bedrock	Hard drilling; grey cuttings

Notes: 1. mbgs = meters below existing ground surface
 2. obtained with a hand held GPS unit – UTM, Zone 21, NAD 83

Apparent bedrock was encountered at eight (8) of the eleven (11) drilled locations at depths ranging from 0.6 mbgs to 1.6 mbgs. Apparent bedrock was not encountered at PD-01, PD-03 and PD-04 as the bedrock interface extended beyond the maximum penetration length of the drill steel rods (1.8 m).

8.5. Laboratory Results

Three (3) representative soil samples from test pits excavated within the proposed Shoal Cove Transition Compound were selected for the following testing:

- Coarse gradation;
- Fine gradation (hydrometer);
- Natural moisture; and
- Atterberg limits.

Table 8-3 summarizes the laboratory results; the complete set of results is attached in Appendix B3.

Table 8.3: Summary of Laboratory Results - Shoal Cove Site

Sample ID	Sample Depth (mbgs ¹)	Gradation				Natural Moisture (%)	Atterberg Limits			
		Gravel (%)	Sand (%)	Silt (%)	Clay (%)		LL ²	PL ³	PI ⁴	LI ⁵
TP-01	1.5 – 1.9	23.2	30.3	43.8	2.7	24.7	-*	-*	-*	-*
TP-02	1.0 – 1.2	24.1	35.1	28.8	12.0	12.7	26	19	7	-0.9
TP-04	1.0 – 1.4	43.5	36.7	17.1	2.7	12.6	-*	-*	-*	-*

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- Notes:
1. mbgs = meters below ground surface
 2. LL = Liquid Limit
 3. PL = Plastic Limit
 4. PI = Plasticity Index
 5. LI = Liquid Index
 6. -* = nonplastic

8.6. Discussion and Recommendations

Based on the results of the available test pit information, the subsurface conditions encountered at the Site are suitable to support the proposed structures, using the site preparation and recommendations discussed in the following sections.

The recommendations provided are based drawings and information provided in the project RFP. Below are the structures that will be located at the Shoal Cove Station:

- Control and Utility Buildings (single story, pre-engineered metal structure);
- Gantry or A Frame Dead End Towers; and,

8.6.1. Site Preparation

Proper surface drainage is essential in order to reduce the potential for excess moisture penetration below foundation elements and grade-supported slabs. Site grading should provide positive drainage away from the structures

Conventional earthwork equipment is anticipated to be capable of removing, replacing and re-compacting most of the granular materials. Blasting and/or excavators equipped with impact hammers will likely be required for removing bedrock or large boulders if encountered in excavations above the design grade.

Improper site preparation could result in excessive total and/or differential settlement of the structure and/or trafficability issues. The following are considerations related to site preparation.

8.6.2. Subgrade Preparation

Any organic soils (rootlets), peat, and marine sediment should be stripped and removed to expose bedrock prior to placement of engineered fill or foundation elements. These soils are generally weak and will deform excessively under load. The stripping operations and foundation surface inspection should be supervised by qualified geotechnical personnel.

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8.6.3. Site Grading

Engineered fill will be required to bring the site to design subgrade elevation. Engineered fill will be placed after stripping all topsoil, any soil containing excessive organics and other unsuitable soil, within an area extending at least 2.5 m beyond the perimeter of the footprint of the proposed site.

Engineered fill should be a well graded sand and gravel or a high quality blast rock fill. The maximum allowable particle diameter should be 150 mm subject to engineering approval. All engineered fill shall be approved by geotechnical personnel and placed and compacted under controlled conditions using the following procedures:

- I. The area extent of engineered fill should be controlled by proper surveying techniques to ensure that the top of the engineered fill extends a minimum of 2.5 m beyond the perimeter of the structures to be supported. A maximum slope of 1V:1H (45°) constructed from engineered fill is to be maintained outside of this 2.5 m perimeter. This slope should not be confused with any embankment slopes which should be 1V:2H or flatter.
- II. The area to receive the engineered fill should be stripped of any topsoil, organic matter, fill, sediment and other compressible, weak and deleterious materials. After stripping, the entire area should be inspected and approved by geotechnical personnel. Spongy, wet or soft/loose spots should be sub-excavated to stable subgrade and replaced with compactable approved soil, compatible with subgrade conditions, as directed by geotechnical personnel.
- III. The fill material should be placed in thin layers ranging from 200 mm to 300 mm in thickness, depending on the compaction equipment used. Oversize particles (cobbles and boulders) larger than 100 mm should be discarded, and each fill layer should be uniformly compacted with heavy compactors, suitable for the type of fill used. Under foundations fill should be compacted to at least 100 percent of its Standard Proctor Maximum Dry Density (SPMDD), while under roadways and the general yard area the fill should be compacted to at least 98 percent of its Standard Proctor Maximum Dry Density (SPMDD).
- IV. Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are necessary for the construction of a certifiable engineered fill and compaction procedure and efficiency should be closely monitored by geotechnical personnel.

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- V. The engineered fill should not be frozen and should be placed at moisture content within 2 percent of the optimum value for compaction. The engineered fill should not be placed during winter months when freezing ambient temperatures occur persistently or intermittently.

It is anticipated that imported material from local pits or blast rock fill from on site bedrock can be used for engineered fill. The onsite overburden soils are not suitable for use as engineered fill.

8.6.4. Excavation and Construction Dewatering

It is expected that excavations will be required for the foundation elements and for any buried infrastructure. Conventional unsupported excavations are expected to be feasible where the groundwater table is below the bottom of the excavation. All excavations should be carried out in accordance with applicable occupational health and safety rules and regulations including, but not limited to, Sections 404 to 416 of the Newfoundland and Labrador Occupational Health and Safety Regulations.

Temporary unsupported excavations above the groundwater table and no more than 1.0 m deep should be sloped no steeper than 1H:1V (Horizontal:Vertical; H:V). Flatter slopes will likely be required if weak soil layers are encountered during the excavation. Unsupported excavation below the groundwater table or excavation deeper than 1.0 m should be analyzed on a case-by-case basis. The stability of supported excavations should also be evaluated on a case-by-case basis, should they be required.

Groundwater levels recorded during the excavation of the test pits indicate a groundwater surface as high as 1.0 m below ground surface

Stockpiles of materials and excavated soil should be placed away from the crest of excavations by a distance equal to at least one half of the depth of the excavation or 2.0 m, whichever is greater

8.6.5. Foundations

Conventional spread or strip footings are considered a feasible foundation system for the structures at this site. Other possible foundation alternatives (screw piles, steel piles, and concrete caissons) are not considered feasible due to the shallow bedrock (<2m):

Footings may be founded on engineered fill or bedrock. Foundations based on a maximum of 1.0 m of engineered fill founded on bedrock, the bearing capacity is as follows:

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Spread Footing: Minimum 1.0 m wide	
Factored Geotechnical Resistance at ULS	375 kPa
Geotechnical Resistance at SLS	250 kPa

Foundations based on the engineered fill thicknesses greater than 1.0 m, the bearing capacity is as follows:

Spread Footing: Minimum 1.0 m wide	
Factored Geotechnical Resistance at ULS	275 kPa
Geotechnical Resistance at SLS	150 kPa

If due to large foundation loads or required depth of burial foundations are required to be supported on the underlying bedrock, the following bearing capacities should be used:

Spread Footing: Minimum 1.0 m wide	
Factored Geotechnical Resistance at ULS	1000 kPa
Geotechnical Resistance at SLS	650 kPa

The bedrock surface should be cleaned of loose, weathered rock and other deleterious materials. The quality of the bedrock could not be determined from the test pits or bedrock probing; therefore, inspection of the bedrock surface by qualified geotechnical personnel is recommended to confirm the bearing capacity can be achieved.

During construction, the footing subgrade should be reviewed by qualified geotechnical personnel to confirm adequate bearing capacity. Similarly, the placement and compaction of engineered fill for foundations should be conducted under the supervision of qualified geotechnical personnel. If any weak materials, such as loose pockets of soil, are encountered during construction, these materials should be completely removed and replaced with engineered fill and compacted to 100 percent of Standard Proctor maximum dry density (SPMDD).

The footing subgrade should be protected at all times from rain, snow, freezing temperatures and the ingress of free water. Concrete should not be placed on frozen soil, nor should the soil beneath the footing be allowed to freeze after construction of the footing

The maximum frost penetration calculated for this location is 2.3 m. For frost protection, a minimum of 2.3 m of soil cover, or its thermal equivalent must be maintained around footings.

Settlements of shallow spread footings will vary depending on the magnitude of load, load distribution, depth and size of footing and subgrade soil/rock type(s). However, if

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the recommendations of this report are adhered to, it is expected that settlements associated with the geotechnical resistances at SLS provided above would be in the order of 25 mm total and 15 mm differential, for well prepared bearing surfaces. Foundations based on sound bedrock will have negligible settlement.

It should be noted that the SLS and ULS values provided, together with settlements, are intended for preliminary sizing of foundations. If accurate values are required, detail foundation analysis should be carried out by considering the foundation subgrade conditions, foundation sizes and loadings. In areas of deep fills, creep settlement of the placed fill may pose additional total and differential settlement. Typical creep settlement for fill placed in accordance with Section 8.6.3 is 5 mm \pm 2 mm for every 1 m of fill thickness.

Construction difficulties might arise if a shallow groundwater table is encountered. Temporary dewatering discussed in Section 8.6.4 will be required for footings constructed below the groundwater table.

8.6.6. Lateral Earth Pressures

Foundation will be required to resist lateral earth pressures. Table 8-4 below provides the recommended earth pressure coefficients for the active, passive and “at rest” earth pressure cases for various soil types, as well as the total unit weights.

The earth pressure coefficients in Table 8-4 are based on the Rankine theory and do not include wall friction angles in the calculations. Inclusion of the wall friction angles in the calculation of passive coefficients is not recommended. Since large lateral displacements are required to mobilize the full passive resistance, the passive earth pressure coefficients include a Factor of Safety of 1.5.

Table 8.4: Earth Pressure Coefficient, Soil Unit Weights and Wall Friction Angles

Soil Type	Active Pressure Coefficient K_a	“At Rest” Earth Pressure Coefficient K_o	Passive Pressure Coefficient K_p	Total Soil Unit Weight kN/m^3	Friction Angle Between Soil and Concrete
Engineered Granular Fill	0.33	0.50	3.0	21.0	22

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8.6.7. Slab-on-Grade

Grade-supported concrete floor slabs should be constructed on a prepared subgrade as recommended. Based on proposed grades, the slab subgrade will be engineered fill. Prior to placement of concrete, the entire area should be proof rolled using a 10 tonne vibratory roller and observed by a qualified AMEC representative.

A minimum of 100 mm of clear, washed, crushed gravel should be provided beneath all floor slabs. Should elevations be such that floor slabs are below the exterior finished grade, a properly designed and installed weeping tile drainage system is required. Install a damp-proofing membrane under concrete slabs-on-grade. Based on design grades and groundwater levels encountered, a permanent subdrainage system may not be required. However if the design grade should change then this requirement should be re-analyzed.

The recommended live load on the slab-on-grade is up to 20 kPa. Higher live load on slab-on-grade should be designed as a mat foundation by considering the soil conditions underlying the mat foundation and its impact on any adjacent foundations. All slabs should be structurally independent from walls and columns supported on foundations. Should heavy, concentrated loads be expected near the perimeter of slabs, thickened and reinforced slab edges should be structurally designed accordingly. This will reduce any structural distress that may occur as a result of differential soil movements.

The amount of relative movement and differential settlement within the slabs will vary depending on the soil conditions below the slab and the magnitude of the load supported by the slab. To calculate the amount of slab movement due to the live load, the soil may be modeled as linear springs based on the modulus of subgrade reaction (MSR) or similar analytical methods. A MSR of 20 MPa/m can be used for the engineered fill and 25 MPa/m if the slab subgrade is the native sand and gravel till.

If the calculated differential movements are considered intolerable, then an alternative slab support system such as dowelled joints in the slab-on-grade, a structural slab supported by foundations or mat foundations should be considered.

The excavated subgrade beneath slabs-on-grade should be protected at all times from rain, snow, freezing temperatures, excessive drying and the ingress of free water.

8.6.8. Seismic Design Parameters

In conformance to the criteria in Table 4.1.8.4A, Part 4, Division B of the National Building Code (NBC 2010), the site is classified as either Site Class "B - Rock" for sound bedrock or Site Class "D – Stiff Soil" for compact engineered fill. The four values of the Spectral response acceleration $S_a(T)$ for different periods and the Peak Ground Acceleration (PGA) can be obtained from Table C-2 in Appendix C, Division B of the

Nalcor Energy – Lower Churchill Project
 Geotechnical Investigations
 Various Substations
 Newfoundland and Labrador
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NBC (2010). The design values of F_a and F_v for the project site should be calculated in accordance to Table 4.1.8.4 B and C.

8.6.9. Rock Anchors

Rock anchors may be required for shallow foundations based on bedrock near the grade elevation. For anchor design purposes the following empirical parameters may be used:

• Dry unit weight of undisturbed bedrock	26.5 kN/m ³
• Specific gravity of bedrock	2.6
• Angle of internal of friction (undisturbed bedrock)	40°
• Assumed apex angle	60o
• Unconfined Compressive Strength of Intact Bedrock	35-50 MPa
• Estimated RQD	40-50%
• Minimum Depth of Embedment	3.0 metres

The bedrock in this area can be weathered and fractured. Consideration should be given to using grouted anchors. Should mechanical anchors be used, long sleeves are recommended and an allowance provided for grout anchors in the event that a poorer quality rock is encountered at depth and the test load cannot be maintained. AMEC recommends that for the determination of uplift capacity the buoyant weight of the mobilized cone of rock, as well as the resisting force developed on the surface of the mobilized cone of rock, should be used to determine the ultimate uplift capacity for a particular rock anchor. This zone should be considered as a cone of soil and rock with the apex at the middle of the bond length and side slopes of 30 degrees from the anchor. The anchors must be proof tested to a minimum of 133 percent of the design load. Corrosion protection should be provided for the anchors.

The contractor must excavate to solid, un-weathered rock before drilling any anchor holes. Prior to the placement or construction of the anchors/foundation, all surficial soils and any loose or weathered bedrock should be removed. Should differing conditions be encountered during installation, then those presented in this report, AMEC must be contacted to review these findings and determine if the published perimeters are applicable and revise accordingly.

8.6.10. Access Road

The proposed access road into the substation site will be over bog, marine sediments and bedrock. Any peat and marine sediment should be stripped and removed to expose bedrock prior to placement of engineered fill for the road subgrade. It is anticipated that imported material from local pits or blast rock fill from on site bedrock will have to be used to be prepare the road subgrade.

Nalcor Energy – Lower Churchill Project
 Geotechnical Investigations
 Various Substations
 Newfoundland and Labrador
 September 2012



The rock fill shall consist of hard durable rock particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials. The following gradation limits are recommended:

Sieve Size	% Passing
200 mm	100
100 mm	75-100
25 mm	50-80
4.76	20-55
1.2	10-35
0.3	5-20
0.075	<8

The following specifications are recommended for rock fill placement:

- Place and compact rock fill in continuous horizontal layers not exceeding 300 mm loose and compacted using a 10 tonne vibratory roller utilizing a minimum of 8 passes in each direction;
- The extent of the rock fill to be controlled by proper surveying techniques;
- After stripping and rough grading using onsite till, the sub-grade shall be visually inspected by AMEC to assist in identifying and addressing any soft areas prior to placement of rock fill;
- Oversized particles (cobbles and boulders) larger than 200 mm should be discarded and each fill layer should be uniformly compacted to 100% of its Standard Proctor Maximum Dry Density (SPMDD) within the roadway. Field density testing by visual inspection during proof rolling by experienced geotechnical personnel is required;
- Full-time geotechnical inspection and quality control (by means of frequent field density and laboratory testing) are recommended; and,

The gradation of the road gravel surfacing is recommended to be in accordance with the Department of Transportation and Works, Maintenance Grade 2 specification, and compacted to 100% SPMDD. The thickness of the road gravel should be 300 mm. The road gravel shall consist of hard durable rock particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials. The following gradation limits are recommended:

Sieve Size	% Passing
25 mm	100
9.5 mm	55-80
4.76	35-60
1.2	15-35
0.3	5-20
0.075	3-10

Nalcor Energy – Lower Churchill Project
 Geotechnical Investigations
 Various Substations
 Newfoundland and Labrador
 September 2012



8.6.11. Water Wells

The facilities at Shoal Cove are within Hydrostratigraphic Unit 3 as shown in Hydrogeology of Western Newfoundland, published by the Provincial Department of Environment. This unit generally has producing drilled wells with average depth of 45 m and producing an average of 37 liters per minute (l/min) with a mean of 9 l/min. This report also indicates that there were 126 of 557 wells with no production at all. Please note that Nalcor recently drilled several boreholes and a HDD hole nearby in this stratigraphic unit. Antidotal, word of mouth information suggests that loss of drilling fluids was common to these boreholes, indicating fractured rock and a possibility of better than average water producing aquifers.

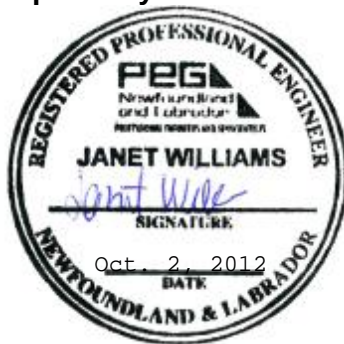
9.0 CLOSURE

This report was prepared for the exclusive use of Nalcor Energy - Lower Churchill Project for specific application to the project. The geotechnical investigation was conducted in accordance with the work plans developed for this project and verbal requests from Nalcor Energy – Lower Churchill Project. The work was performed using generally accepted practices and procedures commonly used in the industry. The limitations of this report are stated in Appendix F.

Yours Truly,

AMEC Environment & Infrastructure
A Division of AMEC Americas Limited

Prepared by:



Janet Williams, P. Eng.
Geotechnical Engineer

Reviewed by:

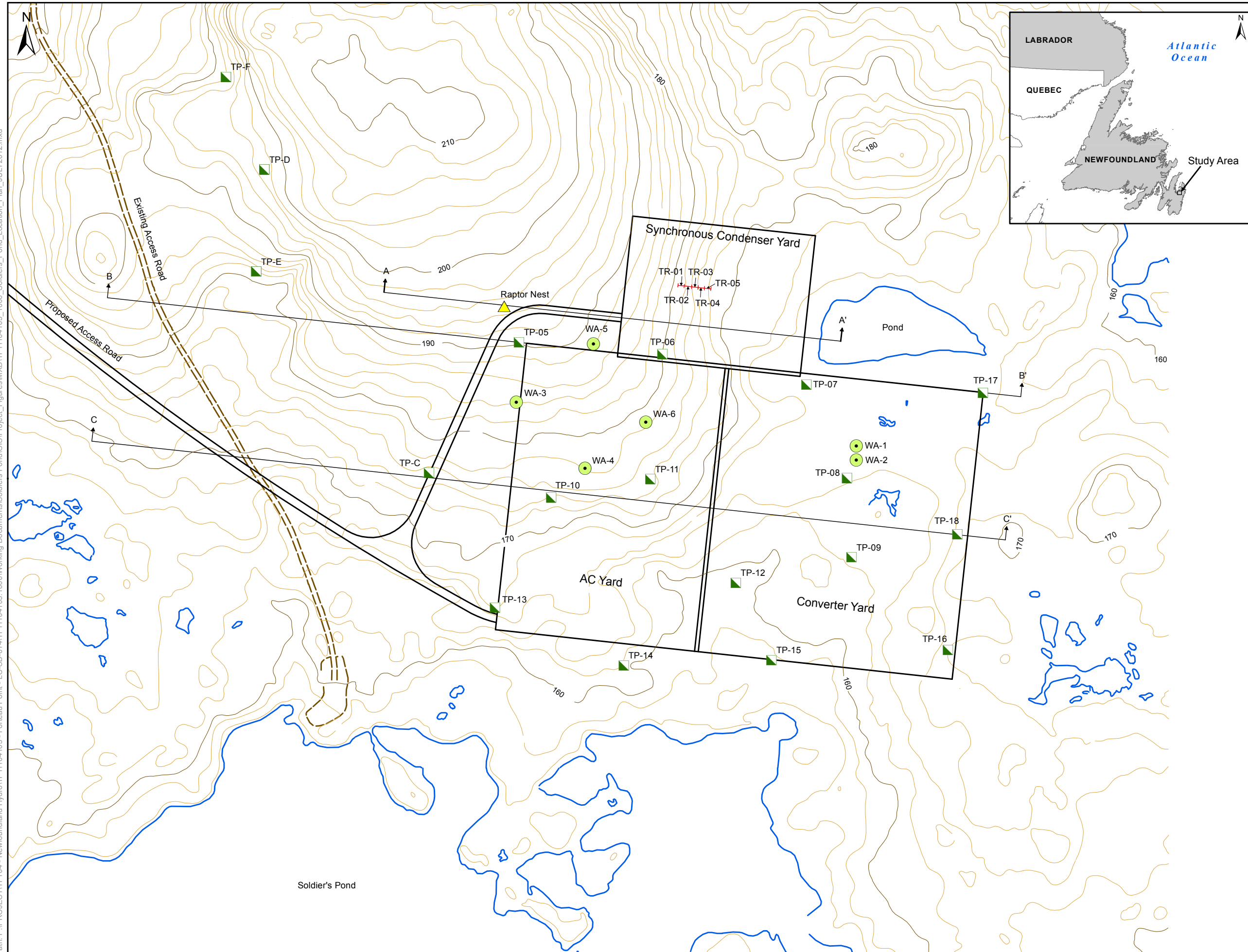
Prapote Boonsinsuk, PhD, P. Eng.



APPENDIX A
DRAWINGS



APPENDIX A1
SOLDIERS POND SITE



- NOTES**
1. ALL DIMENSIONS ARE IN METRES.
 2. DO NOT SCALE FROM DRAWING.
 3. THIS DRAWING IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
 4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
 5. BASE MAP IS PROJECTED WITHIN COORDINATE SYSTEM UTM NAD83 UTM ZONE 22.
 6. NUMBERING FOLLOWS NALCOR'S SUGGESTION. TEST PITS 1 TO 4 NOT EXCAVATED.
 7. TEST PITS C TO F WERE EXTRA TEST PITS ADDED BY NALCOR DURING THE FIELDWORK.
 8. TEST PITS A AND B WERE NOT EXCAVATED DUE TO THE PRESENCE OF A RAPTOR NEST.
 9. BASE MAP PROVIDED BY SNC-LAVALIN INC. DRAWING NAME: 505573-4500-41DD-2001-PC.dwg

- LEGEND**
- Test Pit (2012)
 - Wenner Array (2012)
 - Trench encompassing Trench Notes TR-01 to TR-05
 - Contour Major
 - Contour Minor

amec
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CLIENT

PROJECT TITLE
 Geotechnical Investigations and Resistivity Testing
 Sub - Station Sites

DRAWING TITLE
 Soldiers Pond Site
 2012 Test Location Plan

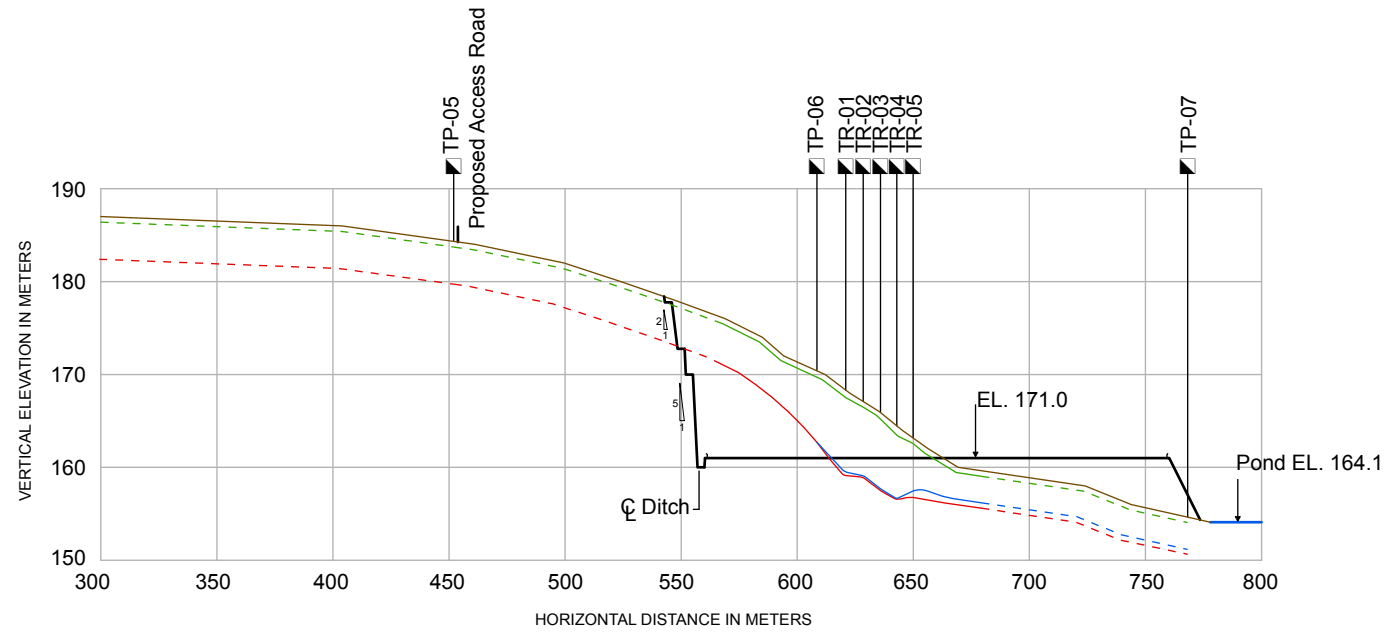
PROJECT NUMBER
 TF11104105.1000

SCALE
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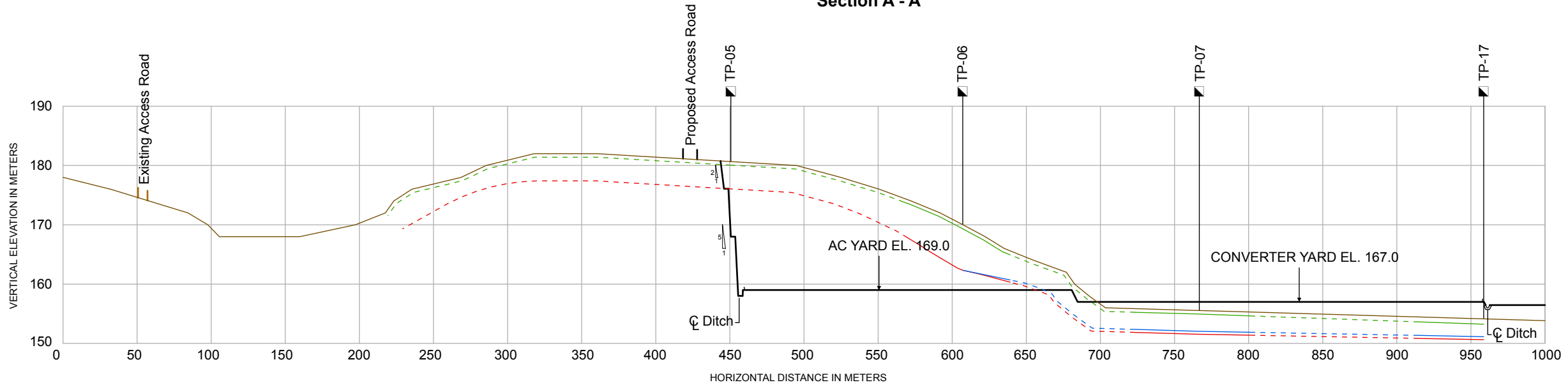
PREPARED BY MD	REVIEWED BY PB & JW	APPROVED BY CM
DRAWING NO. 1	DATE July 2012	REV 0

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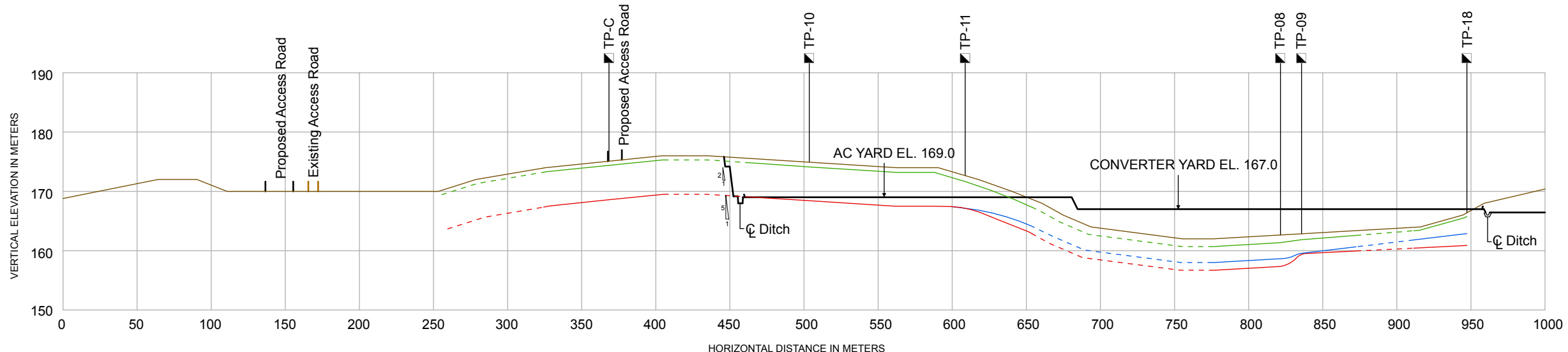
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Section A - A'



Section B - B'



Section C - C'

NOTES

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5. BASE MAP IS PROJECTED WITHIN COORDINATE SYSTEM UTM NAD83 UTM ZONE 22.
6. BASE MAP PROVIDED BY SNC-LAVALIN INC. DRAWING NAME: 505573-4500-41DD-2001-PC.dwg

LEGEND

- ▲ Test Pit
- Ground Surface
- Top of Till
- - - Assumed Top of Till
- Top of Bedrock
- - - Assumed Top of Bedrock
- Groundwater Table
- - - Assumed Groundwater Table



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PROJECT TITLE

Geotechnical Investigations and Resistivity Testing
Sub - Station Sites

DRAWING TITLE

Interpreted Cross Sections at
Soldiers Pond Site

PROJECT NUMBER

TF1104105.1000

SCALE

NOT TO SCALE

PREPARED BY

MD

REVIEWED BY

PB & JW

APPROVED BY

CM

DRAWING NO.

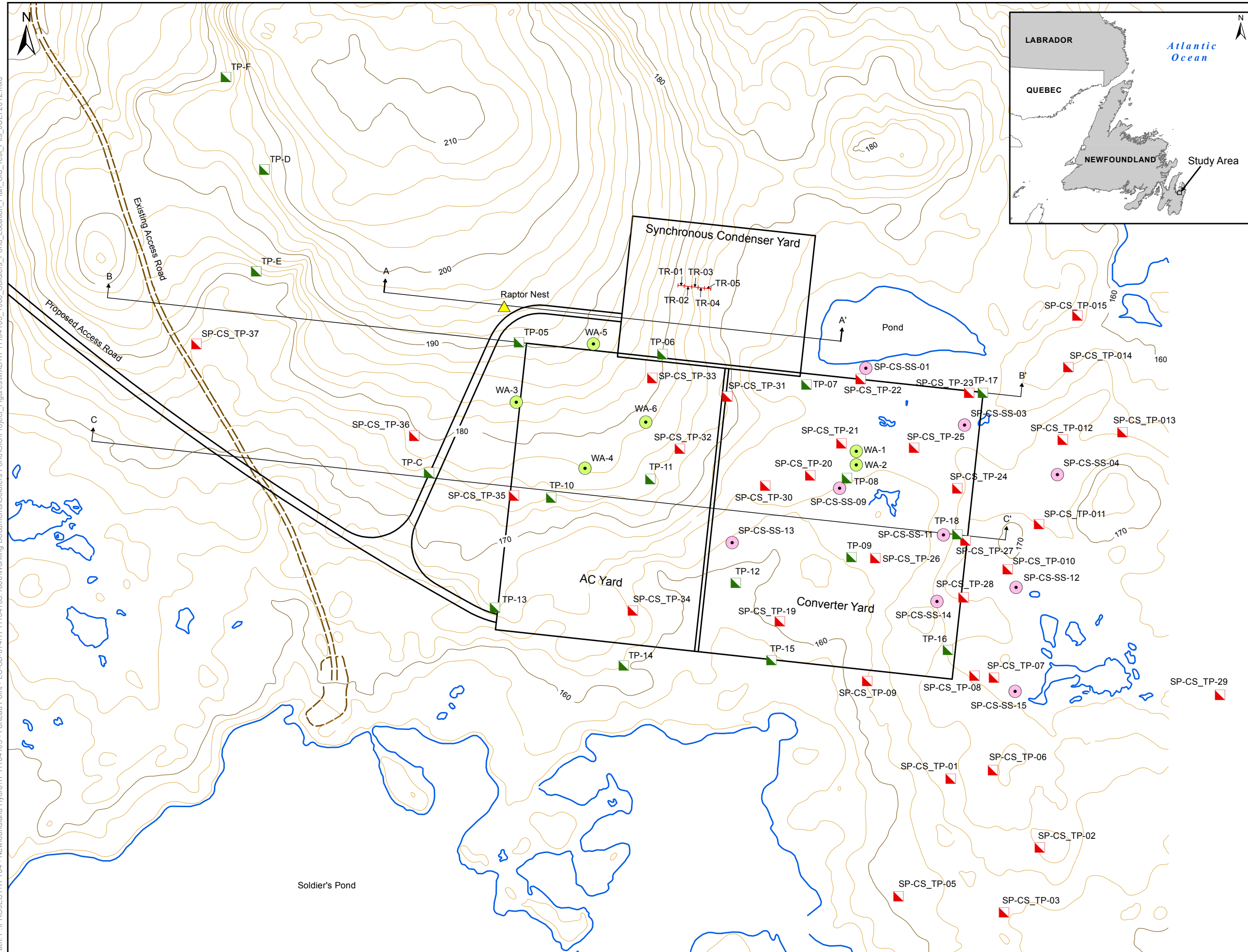
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DATE

July 2012

REV

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NOTES

1. ALL DIMENSIONS ARE IN METRES.
2. DO NOT SCALE FROM DRAWING.
3. THIS DRAWING IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. BASE MAP IS PROJECTED WITHIN COORDINATE SYSTEM UTM NAD83 UTM ZONE 22.
6. NUMBERING FOLLOWS NALCOR'S SUGGESTION. TEST PITS 1 TO 4 NOT EXCAVATED.
7. TEST PITS C TO F WERE EXTRA TEST PITS ADDED BY NALCOR DURING THE FIELDWORK.
8. TEST PITS A AND B WERE NOT EXCAVATED DUE TO THE PRESENCE OF A RAPTOR NEST.
9. BASE MAP PROVIDED BY SNC-LAVALIN INC. DRAWING NAME: 505573-4500-41DD-2001-PC.dwg

LEGEND

- Test Pit (2012)
- Test Pit (2008)
- Wenner Array (2012)
- Schlumberger Sounding (2008)
- Trench encompassing Trench Notes TR-01 to TR-05
- Contour Major
- Contour Minor



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PROJECT TITLE

Geotechnical Investigations and Resistivity Testing
Sub - Station Sites

DRAWING TITLE

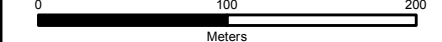
Soldiers Pond Site
2008 and 2012 Test Location Plan

PROJECT NUMBER

TF1104105.1000

SCALE

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PREPARED BY

MD

REVIEWED BY

PB & JW

APPROVED BY

CM

DRAWING NO.

3

DATE

July 2012

REV

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APPENDIX A2
CHURCHILL FALLS SITE



- NOTES**
1. ALL DIMENSIONS ARE IN METRES.
 2. DO NOT SCALE FROM DRAWING.
 3. THIS DRAWING IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
 4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
 5. BASE MAP IS PROJECTED WITHIN COORDINATE SYSTEM UTM NAD83 UTM ZONE 20.
 6. BASE MAP AND AERIAL PHOTO PROVIDED BY SNC-LAVALIN INC. DRAWING NAME: 505573-4100-410D-2001-00-XXX CRAIG.DWG
 7. TEST PITS 12, 16 ETC. ARE THOSE SUGGESTED BY NALCOR ON NE DOC NO. MFA-SN-CD-4100-CV-PL-0001-01 - REV. B1. TEST PITS A, B, ETC. ARE LOCATED IN AREAS SUGGESTED BY NALCOR FIELD SUPERVISOR DUE TO POSSIBLE CHANGE OF SUBSTATION LOCATION.

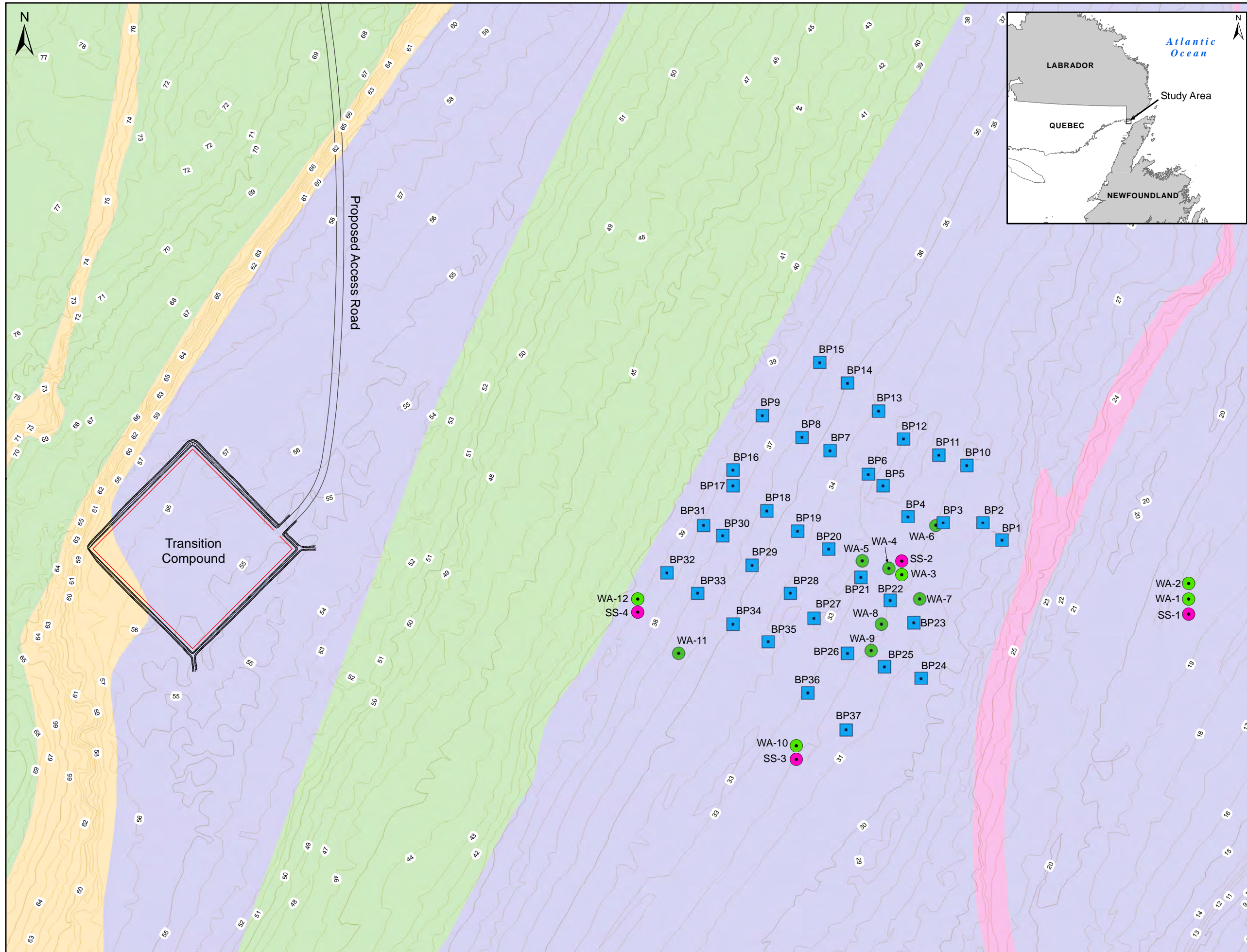
- LEGEND**
- Test Pit
 - Schlumberger Sounding
 - Wenner Array
 - Contour Major
 - Contour Minor

AMEC Environment & Infrastructure A Division of AMEC Americas Limited		
CLIENT		
PROJECT TITLE		
Geotechnical Investigations and Resistivity Testing Sub - Station Sites		
DRAWING TITLE		
Churchill Falls Site Test Location Plan		
PROJECT NUMBER		
TF 11104105.1000		
SCALE		
1:5,000 		
PREPARED BY	REVIEWED BY	APPROVED BY
MD	PB & JW	CM
DRAWING NO.	DATE	REV
4	July 2012	0

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APPENDIX A3
FORTEAU POINT SITE



NOTES

1. ALL DIMENSIONS ARE IN METRES.
2. DO NOT SCALE FROM DRAWING.
3. THIS DRAWING IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. BASE MAP IS PROJECTED WITHIN COORDINATE SYSTEM UTM NAD83 UTM ZONE 21.
6. BASE MAP PROVIDED BY SNC-LAVALIN INC. DRAWING NAME: FORTEAU POIN TRANSITION COMPOUND-FOR INFORMATION ONLY.dwg

LEGEND

- Probe
- Schlumberger Sounding
- Wenner Array
- Contour Major
- Contour Minor
- Raised Beach Material
- Organic Growth and Weathered Bedrock
- Limestone Bedrock
- Sandstone Bedrock



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PROJECT TITLE

Geotechnical Investigations and Resistivity Testing
Sub - Station Sites

DRAWING TITLE

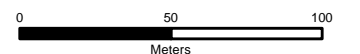
Forteau Point Site
Test Location Plan and Interpreted Surficial Geology

PROJECT NUMBER

TF11104105.1000

SCALE

1:2,500



PREPARED BY

MD

REVIEWED BY

PB & JW

APPROVED BY

CM

DRAWING NO.

5

DATE

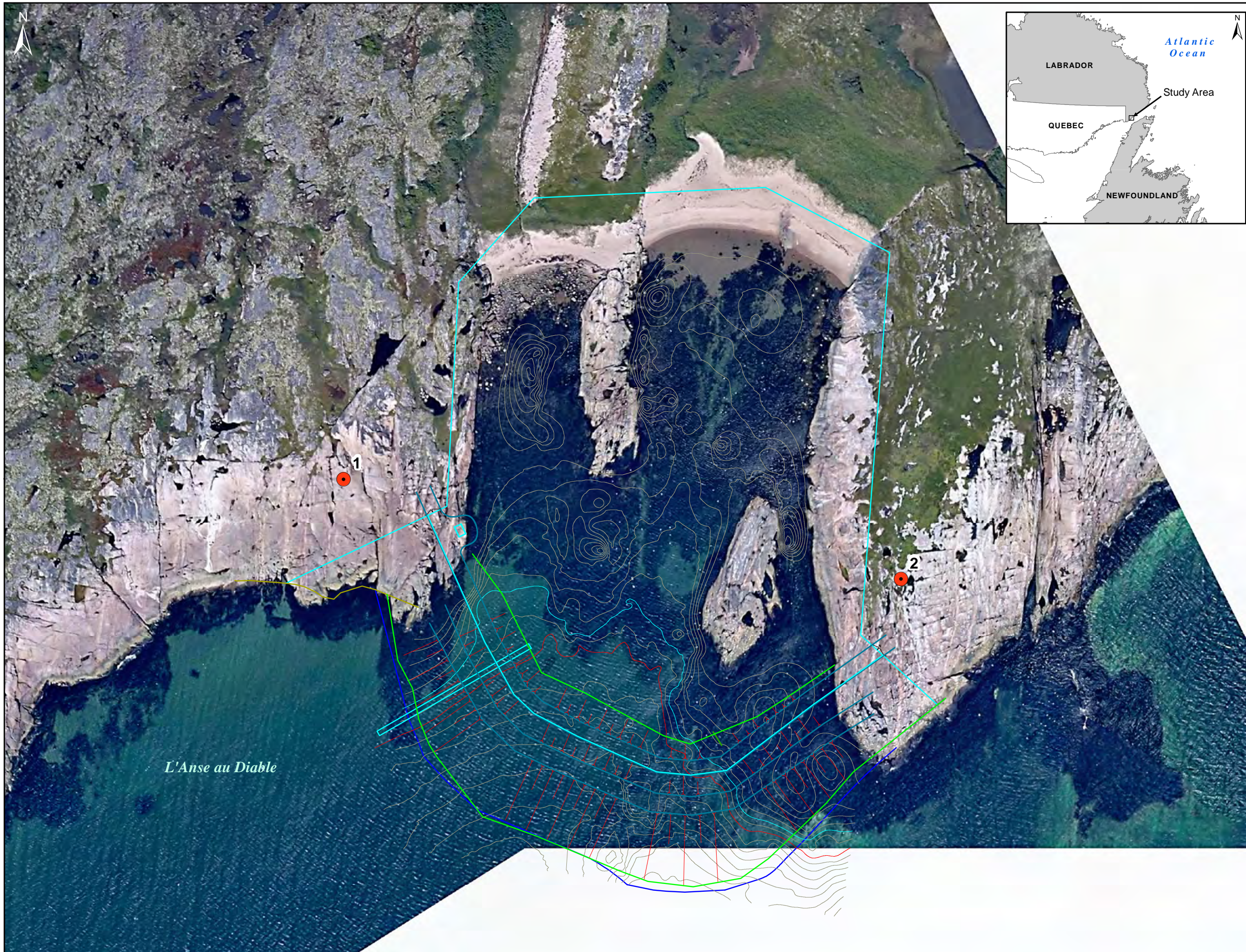
July 2012

REV

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APPENDIX A4
L'ANSE-AU-DIABLE SITE

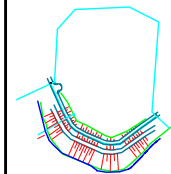


NOTES

1. ALL DIMENSIONS ARE IN METRES.
2. DO NOT SCALE FROM DRAWING.
3. THIS DRAWING IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. BASE MAP IS PROJECTED WITHIN COORDINATE SYSTEM UTM NAD83 UTM ZONE 21.
6. BASE MAP PROVIDED BY SNC-LAVALIN INC. DRAWING NAME: L'ANSE-AU-DIABLE - FOR INFORMATION ONLY.dwg

LEGEND

 Data Point

 Proposed Breakwater and Infrastructure Site



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PROJECT TITLE

Geotechnical Investigations and Resistivity Testing
Sub - Station Sites

DRAWING TITLE

L'Anse au Diable Electrode Site
Test Location Plan

PROJECT NUMBER

TF11104105.1000

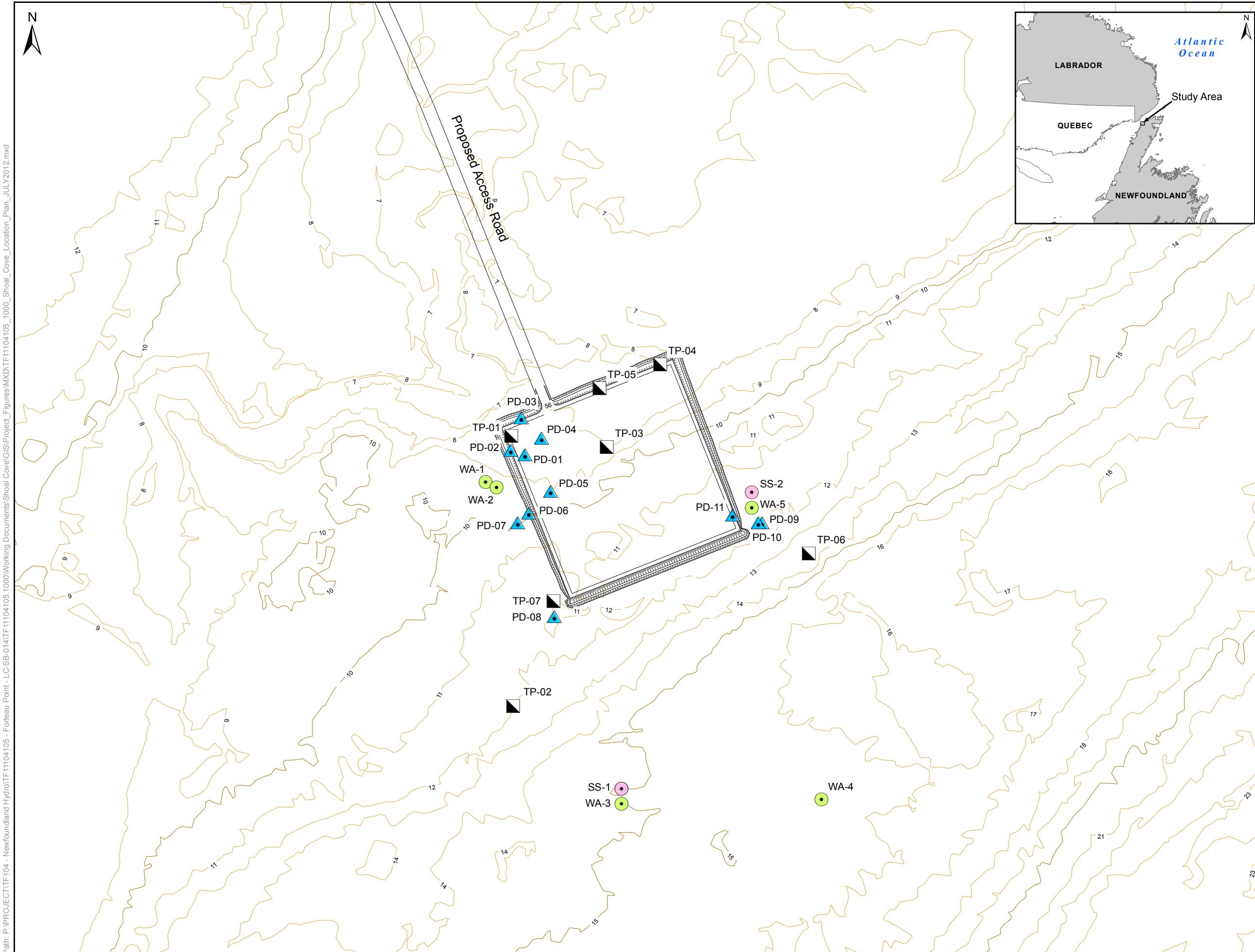
SCALE

As Shown

PREPARED BY	REVIEWED BY	APPROVED BY
MD	PB & JW	CM
DRAWING NO.	DATE	REV
6	July 2012	0



APPENDIX A5
SHOAL COVE SITE



NOTES

1. ALL DIMENSIONS ARE IN METRES.
2. DO NOT SCALE FROM DRAWING.
3. THIS DRAWING IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. BASE MAP IS PROJECTED WITHIN COORDINATE SYSTEM UTM NAD83 UTM ZONE 21.
6. BASE MAP PROVIDED BY SNC-LAVALIN INC. DRAWING NAME: SHOAL COVE TRANSITION COMPOUND - FOR INFORMATION ONLY.DWG

LEGEND

- Percussion Probe
- Test Pit
- Schlumberger Sounding
- Wenner Array
- Contour Major
- Contour Minor

DRAFT



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PROJECT TITLE

Geotechnical Investigations and Resistivity Testing
Sub - Station Sites

DRAWING TITLE

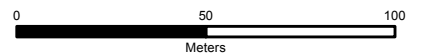
Shoal Cove Site
Test Location Plan

PROJECT NUMBER

TF11104105.1000

SCALE

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PREPARED BY

MD

REVIEWED BY

PB & JW

APPROVED BY

CM

DRAWING NO.

7

DATE

July 2012

REV

0



APPENDIX B

TEST PIT RECORDS AND LABORATORY RESULTS



APPENDIX B1
SOLDIERS POND SITE



Test Pit: TP-05

Firm:	Nalcor Energy			Date: May 18, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253598	E 350393
				Inspector: Brad Walsh

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.4	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, abundant surficial boulders, loose, dark brown to black, moist.	-	-	-
0.4 – 0.6	WEATHERED TILL – Gravelly SAND, trace to some silt, some cobbles, trace boulders, oxidized, compact, reddish-brown, moist.	-	-	-
0.6 – 4.6	TILL – Gravelly SAND, some silt, some cobbles and boulders, compact, light brown-grey, moist.	TP-05	3.5 – 4.5	Grab
4.6	Test pit terminated prematurely in TILL due to close proximity to raptor nest.	-	-	-
Estimated Cobbles (%) 10 - 20		Estimated Boulders (%) 10 - 20		Estimated Max Diameter (m) 0.5

General Notes

1. Test pit terminated prematurely at 4.6 m depth in TILL due to close proximity to raptor nest.
2. Test pit dry upon completion.
3. Large boulders encountered at surface.
4. UTM coordinates obtained using handheld Lowrance GPS unit referencing NAD83 Zone 22.



Test Pit: TP-06

Firm:	Nalcor Energy			Date: May 15, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253585	E 350549
		Inspector: Brad Walsh		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.4	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, abundant surficial boulders (> 0.5 m), loose, dark brown to black, moist.	-	-	-
0.4 – 0.7	WEATHERED TILL – Gravelly SAND, trace silt, oxidized, compact, reddish-brown, moist.	-	-	-
0.7 – 7.7	TILL – SAND AND GRAVEL, trace silt, some cobbles and boulders, dense, light brown-grey, moist.	TP-06	4.5 – 5.5	Grab
7.7	Test pit terminated at 7.7 m on probable BEDROCK.	-	-	-
Estimated Cobbles (%) 10 - 20		Estimated Boulders (%) 10 - 20		Estimated Max Diameter (m) 0.5

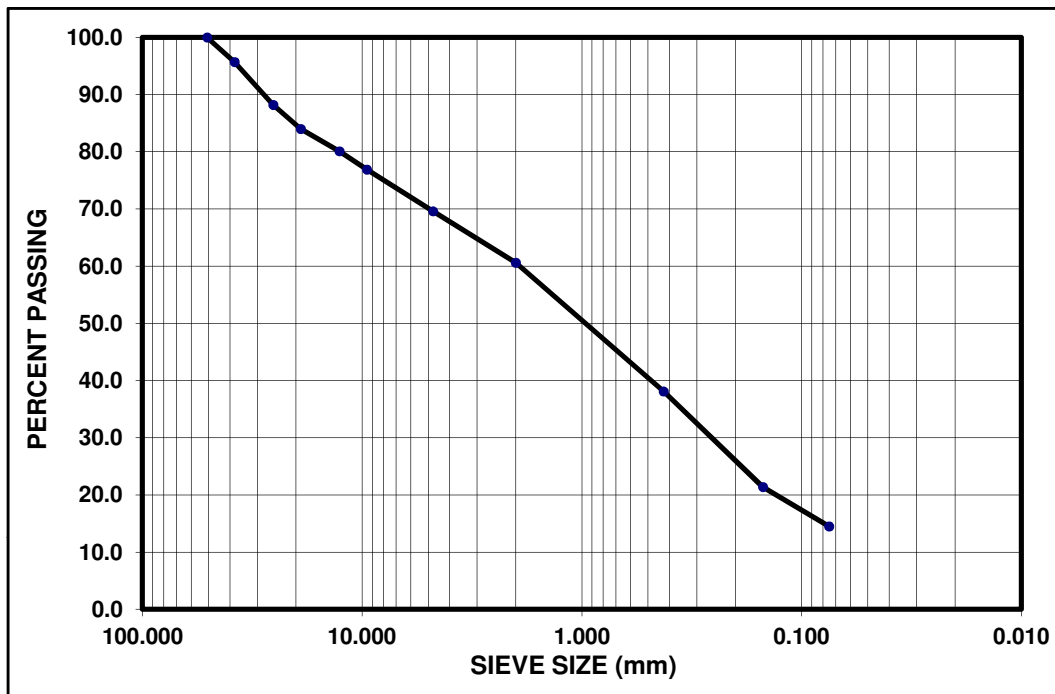
General Notes

1. Test pit terminated at 7.7 m depth due to refusal on probable BEDROCK.
2. Groundwater seepage encountered at 7.7 m depth.
3. UTM coordinates obtained using handheld Garmin GPS unit referencing NAD83 Zone 22.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	17-May-12
Project:	Geotechnical Site Investigation Proposed Substation - Soldiers Pond	Date Tested:	24-May-12
Client:	Nalcor Energy	Sample Description:	Gravelly Sand, some Silt and/or Clay
Sampled By:	B. Walsh	Sample Depth:	3.5m - 4.5m
Test Pit ID:	TP-5	Sample Type:	Test Pit
Lab ID No.:	4412_R1		



SIEVE SIZE (mm)	PERCENT PASSING	GRADING LIMITS
50.800	100.0	
38.100	95.7	
25.400	88.2	
19.050	84.0	
12.700	80.1	
9.525	76.9	
4.760	69.6	
2.000	60.6	
0.425	38.1	
0.150	21.4	
0.075	14.5	

% Gravel: 30.4
 % Sand: 55.1
 % Silt / Clay: 14.5

Comments: *The as received moisture content of the sample was determined to be 4.9%.*

Estimated in the field: % Boulder: 10 - 20 % Cobble: 10 - 20

Reporting of these test results constitutes a testing service only.
 Engineering interpretation or evaluation of the test results is provided only on written request.

AMEC Environment & Infrastructure

Per: *[Signature]*

AMEC Environment & Infrastructure
 133 Crosbie Road
 P.O. Box 13216, St John's NL
 Canada, A1B 4A5
 Tel. (709) 722-7023
 Fax. (709) 722-7353

Construction Materials Laboratory
 36 Pippy Place
 P.O. Box 13216, St. John's NL
 Canada, A1B 3X2
 Tel. (709) 722-5062
 Fax. (709) 722-5025



MOISTURE DENSITY RELATIONSHIP

Client: Nalcor Energy Project #: TF11104105.1000
 Job Location: Soldiers Pond Substation Lab No: 4412
 Sample Source: TP-05 Material: Test Pit

Date Sampled: May 17, 2012 Sampled By: B. Walsh of AMEC

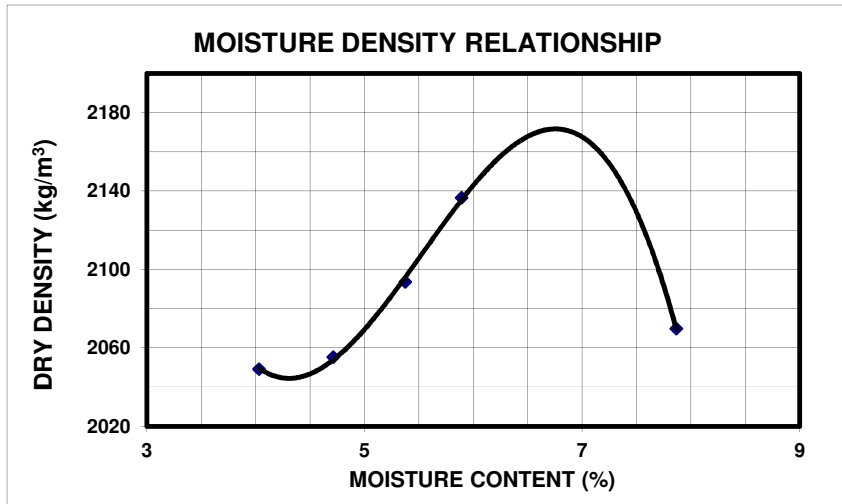
Date Received: May 23, 2012 Preparation:

Moist	Dry
-------	-----

Percent Retained:	4.75	23.1%		19.05	16.0%
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Compaction Std.	ASTM D698			Method	C
-----------------	-----------	--	--	--------	---

Moisture Content	4.0	4.7	5.4	5.9	7.9	9.4
Dry Density kg/m ³	2049	2055	2094	2137	2070	2063



Oversized Material Correction

	<u>Uncorrected</u>	<u>Corrected</u>
Maximum Dry Density	2151 kg/m ³	2219 kg/m ³
Maximum Moisture	6.8 %	6.0 %

Comments:

AMEC Environment & Infrastructure
 a division of AMEC Americas Ltd

Tested by, J. Fowlow

Reviewed by, DRAFT



Test Pit: TP-07

Firm:	Nalcor Energy			Date:	May 18, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL				
Contract No.:	LC-SB-014	Location:	N 5253552	E 350706	Inspector: Ian Butt

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.3	TOPSOIL/ROOTMAT – rootlets, organics, loose, dark brown to black, moist.	-	-	-
0.3 – 0.6	WEATHERED TILL – SAND AND GRAVEL, trace to some silt, trace cobbles, oxidized, compact, reddish-orange, moist.	-	-	-
0.6 – 4.0	TILL – SAND AND GRAVEL, trace to some silt, trace cobbles and boulders, compact, light grey, moist to saturated.	Sample A	3.9 – 4.0	Grab
4.0	Test pit terminated at 4.0 m depth due to excessive sloughing of the test pit walls.	-	-	-
Estimated Cobbles (%) 1 - 10		Estimated Boulders (%) 1 - 10		Estimated Max Diameter (m) 0.5

General Notes

1. Test pit terminated at 4.0 m depth due to excessive sloughing of the test pit walls.
2. Groundwater encountered at 3.5 m depth.
3. Large boulders encountered at surface.
4. UTM coordinates obtained using handheld Garmin GPS unit referencing NAD83 Zone 22.



Test Pit: TP-08

Firm:	Nalcor Energy			Date: May 18, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253450	E 350750
		Inspector: Ian Butt		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 1.0	TOPSOIL/ROOTMAT – rootlets, organics, loose, dark brown to black, moist.	-	-	-
1.0 – 1.3	WEATHERED TILL – Gravelly SAND, trace to some silt, trace to some cobbles and boulders, oxidized, loose, reddish-orange, moist.	-	-	-
1.3 – 5.3	TILL – Gravelly SAND, some silt, trace to some cobbles and boulders, compact to dense, light grey, moist to saturated.	Sample A	5.0 – 5.1	Grab
5.3	Test pit terminated at 5.3 m on BEDROCK.	-	-	-

Estimated Cobbles (%) 1 - 20	Estimated Boulders (%) 1 - 20	Estimated Max Diameter (m) 0.5
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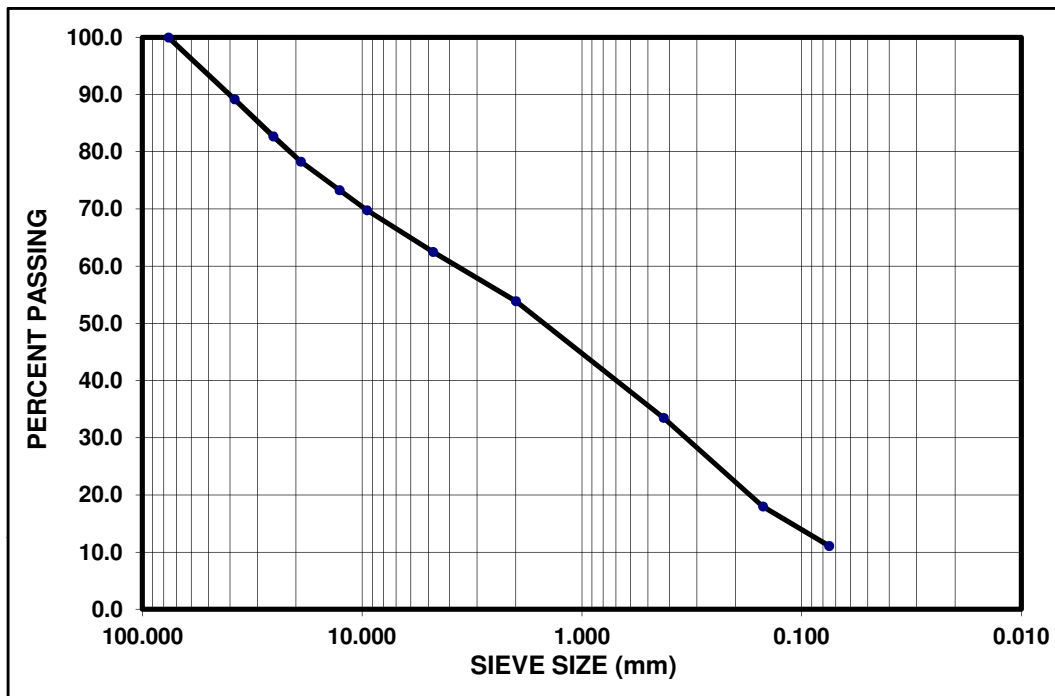
General Notes

1. Test pit terminated at 5.3 m on BEDROCK.
2. Groundwater encountered at 4.0 m depth.
3. Minor sloughing of test pit walls below 4.0 m depth.
4. Test pit moved ~20 m NW from proposed test pit location (N 5253436 / E 350762) to avoid bog.
5. UTM coordinates obtained using handheld Garmin GPS unit referencing NAD83 Zone 22.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	18-May-12
Project:	Geotechnical Site Investigation Proposed Substation - Soldiers Pond	Date Tested:	24-May-12
Client:	Nalcor Energy	Sample Description:	Gravelly Sand, some Silt and/or Clay
Sampled By:	B. Walsh	Sample Depth:	5.0m - 5.1m
Test Pit ID:	TP-08	Sample Type:	Test Pit
Lab ID No.:	4415_R1		



SIEVE SIZE (mm)	PERCENT PASSING	GRADING LIMITS
76.200	100.0	
38.100	89.2	
25.400	82.7	
19.050	78.3	
12.700	73.3	
9.525	69.8	
4.760	62.5	
2.000	53.9	
0.425	33.5	
0.150	18.0	
0.075	11.1	

% Gravel: 37.5
 % Sand: 51.4
 % Silt / Clay: 11.1

Comments: The as received moisture content of the sample was determined to be 8.1%.

Estimated in the field: % Boulder: 1 - 20 % Cobble: 1 - 20

Reporting of these test results constitutes a testing service only.
 Engineering interpretation or evaluation of the test results is provided only on written request.

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Per: *Paul Allison*

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Test Pit: TP-09

Firm:	Nalcor Energy			Date: May 18, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253364	E 350755
		Inspector: Ian Butt		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 1.0	TOPSOIL/ROOTMAT – rootlets, organics, loose, dark brown to black, wet.	-	-	-
1.0 – 3.5	TILL – SAND AND GRAVEL, trace to some silt, trace cobbles and boulders, loose to compact, light grey, moist to wet.	Sample A	3.4 – 3.5	Grab
3.5	Test pit terminated at 3.5 m on BEDROCK.	-	-	-

Estimated Cobbles (%) 1 - 10	Estimated Boulders (%) 1 - 10	Estimated Max Diameter (m) 0.5
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General Notes

1. Test pit terminated at 3.5 m on BEDROCK.
2. Groundwater encountered at 3.3 m depth.
3. Minor sloughing of test pit walls.
4. UTM coordinates obtained using handheld Garmin GPS unit referencing NAD83 Zone 22.



Test Pit: TP-10

Firm:	Nalcor Energy			Date: May 22, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253429	E 350428
				Inspector: Brad Walsh

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.6	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, abundant surficial boulders, loose, dark brown to black, moist.	-	-	-
0.6 – 0.8	WEATHERED TILL – Gravelly SAND, trace silt, oxidized, loose to compact, reddish-brown, moist.	-	-	-
0.8 – 5.1	TILL – SAND AND GRAVEL, trace silt, some cobbles and boulders, compact, light brown to grey, moist.	TP-10	4.0 – 4.5	Grab
5.1	Test pit terminated at 5.1 m on BEDROCK.	-	-	-
Estimated Cobbles (%) 25 - 30		Estimated Boulders (%) 20 - 25		Estimated Max Diameter (m) 0.5

General Notes

1. Test pit terminated at 5.1 m on BEDROCK.
2. Test pit dry upon completion.
3. UTM coordinates obtained using handheld Lowrance GPS unit referencing NAD83 Zone 22.



Test Pit: TP-11

Firm:	Nalcor Energy			Date: May 18, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253449	E 350536
		Inspector: Ian Butt		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.5	TOPSOIL/ROOTMAT – rootlets, organics, loose, dark brown to black, moist.	-	-	-
0.5 – 1.0	WEATHERED TILL – Gravelly SAND, trace to some silt, trace cobbles, oxidized, compact, reddish-orange, moist.	-	-	-
1.0 – 5.5	TILL – Gravelly SAND, some silt, trace cobbles and boulders, dense, light grey, moist.	Sample A	5.4 – 5.5	Grab
5.5	Test pit terminated at 5.5 m on BEDROCK.	-	-	-
Estimated Cobbles (%) 1 - 10		Estimated Boulders (%) 1 - 10		Estimated Max Diameter (m) 0.5

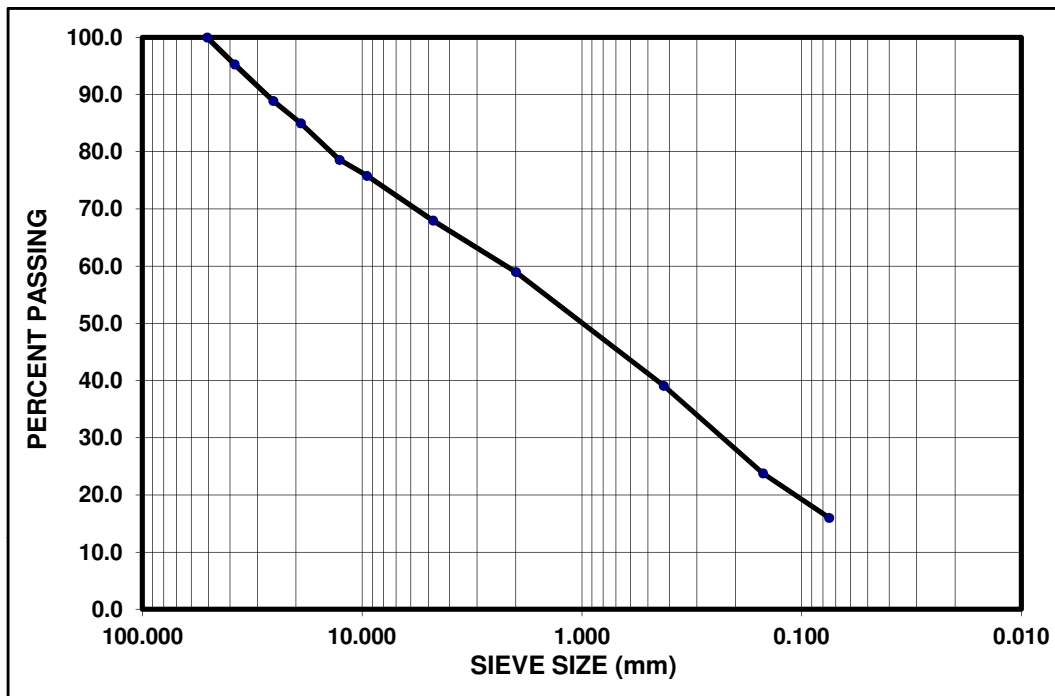
General Notes

1. Test pit terminated at 5.5 m on BEDROCK.
2. Groundwater seepage encountered at 5.5 m depth.
3. UTM coordinates obtained using handheld Garmin GPS unit referencing NAD83 Zone 22.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	18-May-12
Project:	Geotechnical Site Investigation Proposed Substation - Soldiers Pond	Date Tested:	24-May-12
Client:	Nalcor Energy	Sample Description:	Gravelly Sand, some Silt and/or Clay
Sampled By:	B. Walsh	Sample Depth:	n / a
Test Pit ID:	TP-11	Sample Type:	Test Pit
Lab ID No.:	4414_R1		



SIEVE SIZE (mm)	PERCENT PASSING	GRADING LIMITS
50.800	100.0	
38.100	95.3	
25.400	88.9	
19.050	85.0	
12.700	78.6	
9.525	75.8	
4.760	68.0	
2.000	59.0	
0.425	39.1	
0.150	23.8	
0.075	16.0	

% Gravel: 32.0
 % Sand: 52.0
 % Silt / Clay: 16.0

Comments: The as received moisture content of the sample was determined to be 8.0%.

Estimated in the field: % Boulder: 1 - 10 % Cobble: 1 - 10

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Per: *Janet Allison*

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MOISTURE DENSITY RELATIONSHIP

Client: Nalcor Energy Project #: TF11104105.1000
 Job Location: Soldiers Pond Substation Lab No: 4415
 Sample Source: TP-11 Material: Test Pit

Date Sampled: May 18, 2012 Sampled By B. Walsh of AMEC

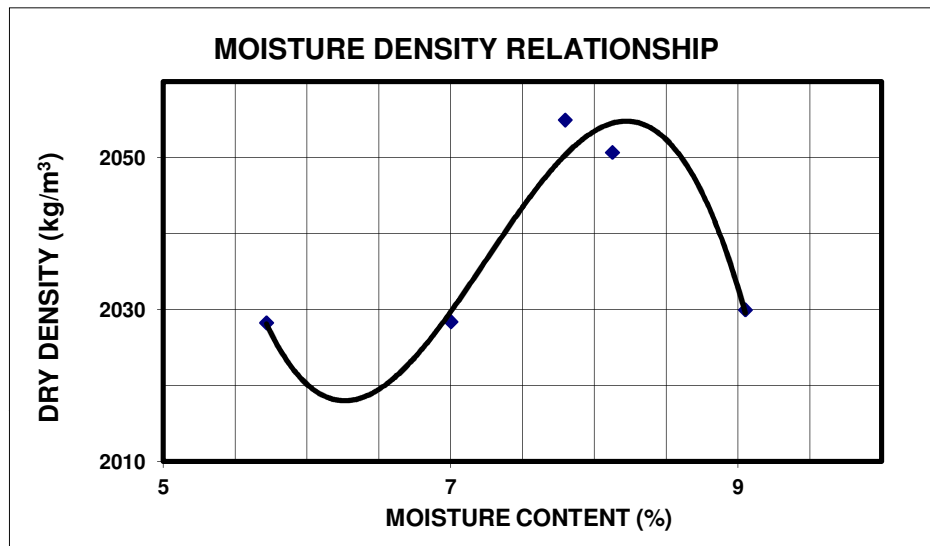
Date Received: May 23, 2012 Preparation

Moist	Dry
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Percent Retained:	4.75	32.0%	9.51	24.2%
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Compaction Std.	ASTM D698	Method	B
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Moisture Content	5.7	7.0	7.8	8.1	9.1
Dry Density kg/m ³	2028	2028	2055	2051	2030



Oversized Material Correction

	<u>Uncorrected</u>	<u>Corrected</u>
Maximum Dry Density	2054 kg/m ³	2174 kg/m ³
Maximum Moisture	8.2 %	6.6 %

Comments:

AMEC Environment & Infrastructure
 a division of AMEC Americas Ltd

Tested by, J. Fowlow

Reviewed by, DRAFT



Test Pit: TP-12

Firm:	Nalcor Energy			Date: May 15, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253336	E 350629
		Inspector: Brad Walsh		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.2	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.2 – 0.8	WEATHERED TILL – SAND, some gravel to gravelly, trace to some silt, some cobbles and boulders, oxidized, compact, dark brown, moist.	-	-	-
0.8 – 3.6	TILL – SAND AND GRAVEL, trace to some silt, some cobbles, some to abundant boulders, very dense, grey, moist.	-	-	-
3.6	Test pit terminated at 3.6 m on BEDROCK.	-	-	-
Estimated Cobbles (%) 10 - 25		Estimated Boulders (%) 10 - 20		Estimated Max Diameter (m) 0.5

General Notes

1. Test pit terminated at 3.6 m on BEDROCK.
2. Groundwater encountered at 3.0 m depth.
3. UTM coordinates obtained using handheld Lowrance GPS unit referencing NAD83 Zone 22.



Test Pit: TP-13

Firm:	Nalcor Energy			Date: May 22, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253309	E 350367
		Inspector: Ian Butt		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.3	TOPSOIL/ROOTMAT – rootlets, organics, loose, dark brown to black, moist.	-	-	-
0.3 – 0.5	WEATHERED TILL – Gravelly SAND, trace silt, trace cobbles and boulders, oxidized, compact, reddish-orange, moist.	-	-	-
0.5 – 5.0	TILL – Gravelly SAND, trace silt, trace cobbles and boulders, dense to very dense, light grey, moist to saturated.	Sample A	4.8 – 4.9	Grab
5.0	Test pit terminated at 5.0 m on BEDROCK.	-	-	-
Estimated Cobbles (%) 1 - 10	Estimated Boulders (%) 1 - 10	Estimated Max Diameter (m) 0.6		

General Notes

1. Test pit terminated at 5.0 m on BEDROCK.
2. Groundwater encountered at 4.5 m depth.
3. Test pit moved ~25 m N from proposed test pit location (N 5253285 / E 350367) to avoid overhead powerline.
4. UTM coordinates obtained using handheld Garmin GPS unit referencing NAD83 Zone 22.



Test Pit: TP-14

Firm:	Nalcor Energy			Date: May 22, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253246	E 350507
		Inspector: Ian Butt		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.3	TOPSOIL/ROOTMAT – rootlets, organics, loose, dark brown to black, moist.	-	-	-
0.3 – 0.8	WEATHERED TILL – SAND AND GRAVEL, trace silt and cobbles, oxidized, compact, reddish-orange, moist.	-	-	-
0.8 – 4.5	TILL – Gravelly SAND, trace to some silt, trace to some cobbles and boulders, oxidized, dense, light grey, moist to wet.	Sample A	4.3 – 4.4	Grab
4.5	Test pit terminated at 4.5 m on BEDROCK.	-	-	-
Estimated Cobbles (%) 1 - 20	Estimated Boulders (%) 1 - 20	Estimated Max Diameter (m) 0.5		

General Notes

1. Test pit terminated at 4.5 m on BEDROCK.
2. Groundwater encountered at 4.0 m depth.
3. Test pit moved ~25 m SW from proposed test pit location (N 5253268 / E 350522) to avoid overhead powerline.
4. UTM coordinates obtained using handheld Garmin GPS unit referencing NAD83 Zone 22.



Test Pit: TP-15

Firm:	Nalcor Energy			Date: May 15, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253252	E 350668
Inspector: Brad Walsh				

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.1	TOPSOIL/ROOTMAT – rootlets, organics, trace to some silt and sand, loose, dark brown to black, moist.	-	-	-
0.1 – 0.9	WEATHERED TILL – SAND, some gravel to gravelly, some silt, some to abundant cobbles and boulders, oxidized, compact to dense, grey-brown, moist.	-	-	-
0.9 – 2.0	TILL – Sandy GRAVEL, some silt, some to abundant cobbles and boulders, very dense, light brown to grey, moist.	TP-15	2.0	Grab
2.0 – 4.0	FRACTURED BEDROCK – Granite, fractured pieces approximately 2.0 m -2.5 m in diameter, blocky to angular.	-	-	-
4.0	Test pit terminated at 4.0 m on BEDROCK.	-	-	-

Estimated Cobbles (%) 20 - 25	Estimated Boulders (%) 15 - 25	Estimated Max Diameter (m) 2.5
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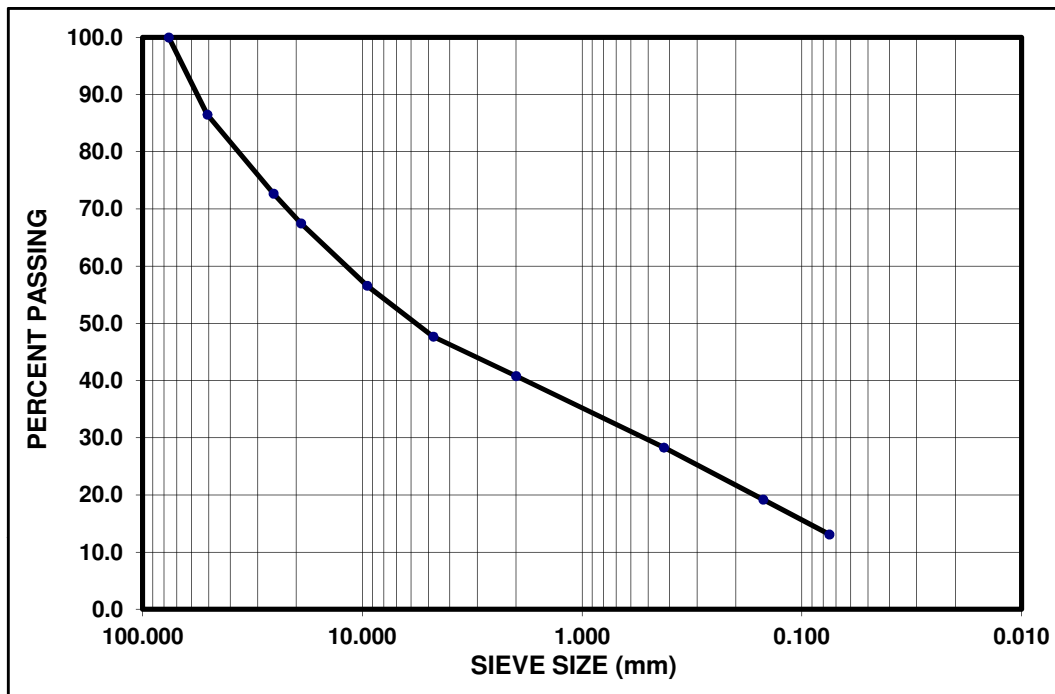
General Notes

1. Test pit terminated at 4.0 m on BEDROCK.
2. Groundwater encountered at 4.0 m depth.
3. UTM coordinates obtained using handheld Lowrance GPS unit referencing NAD83 Zone 22.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	15-May-12
Project:	Geotechnical Site Investigation Proposed Substation - Soldiers Pond	Date Tested:	24-May-12
Client:	Nalcor Energy	Sample Description:	Sandy Gravel, some Silt and/or Clay
Sampled By:	B. Walsh	Sample Depth:	2.0m
Test Pit ID:	TP-15	Sample Type:	Test Pit
Lab ID No.:	4391_R1		



SIEVE SIZE (mm)	PERCENT PASSING	GRADING LIMITS
76.200	100.0	
50.800	86.5	
25.400	72.7	
19.050	67.5	
9.525	56.6	
4.760	47.7	
2.000	40.8	
0.425	28.3	
0.150	19.2	
0.075	13.1	

% Gravel: 52.3
 % Sand: 34.6
 % Silt / Clay: 13.1

Comments: *The as received moisture content of the sample was determined to be 5.3%*

Estimated in the field: % Boulder: 15 - 25 % Cobble: 20 - 25

Reporting of these test results constitutes a testing service only.
 Engineering interpretation or evaluation of the test results is provided only on written request.

AMEC Environment & Infrastructure

Per: *Paro Allisen*

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Test Pit: TP-16

Firm:	Nalcor Energy			Date: May 22, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253263	E 350860
		Inspector: Ian Butt		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.3	TOPSOIL/ROOTMAT – rootlets, organics, loose, dark brown to black, moist.	-	-	-
0.3 – 0.6	WEATHERED TILL – Gravelly SAND, trace to some silt, trace cobbles and boulders, oxidized, loose to compact, reddish-orange, moist.	-	-	-
0.6 – 3.5	TILL – Gravelly SAND, trace to some silt, trace cobbles and boulders, dense to very dense, light grey, moist.	Sample A	3.4 – 3.5	Grab
3.5	Test pit terminated at 3.5 m on BEDROCK.	-	-	-
Estimated Cobbles (%) 1 - 10	Estimated Boulders (%) 1 - 10	Estimated Max Diameter (m) 0.4		

General Notes

1. Test pit terminated at 3.5 m on BEDROCK.
2. Test pit dry upon completion.
3. Test pit walls stable during excavation.
4. Test pit moved ~30 m N from proposed test pit location (N 5253231 / E 350864) to avoid overhead powerline.
5. UTM coordinates obtained using handheld Garmin GPS unit referencing NAD83 Zone 22.



Test Pit: TP-17

Firm:	Nalcor Energy			Date: May 18, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253543	E 350898
		Inspector: Ian Butt		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.6	TOPSOIL/ROOTMAT – rootlets, organics, loose, dark brown to black, moist to wet.	-	-	-
0.6 – 0.9	WEATHERED TILL – Gravelly SAND, trace to some silt, trace cobbles and boulders, oxidized, compact, reddish-orange, moist.	-	-	-
0.9 – 3.5	TILL – Gravelly SAND, some silt, trace cobbles and boulders, compact to dense, light grey, moist to wet.	Sample A	3.3 – 3.4	Grab
3.5	Test pit terminated at 3.5 m on BEDROCK.	-	-	-

Estimated Cobbles (%) 1 - 10	Estimated Boulders (%) 1 - 10	Estimated Max Diameter (m) 0.4
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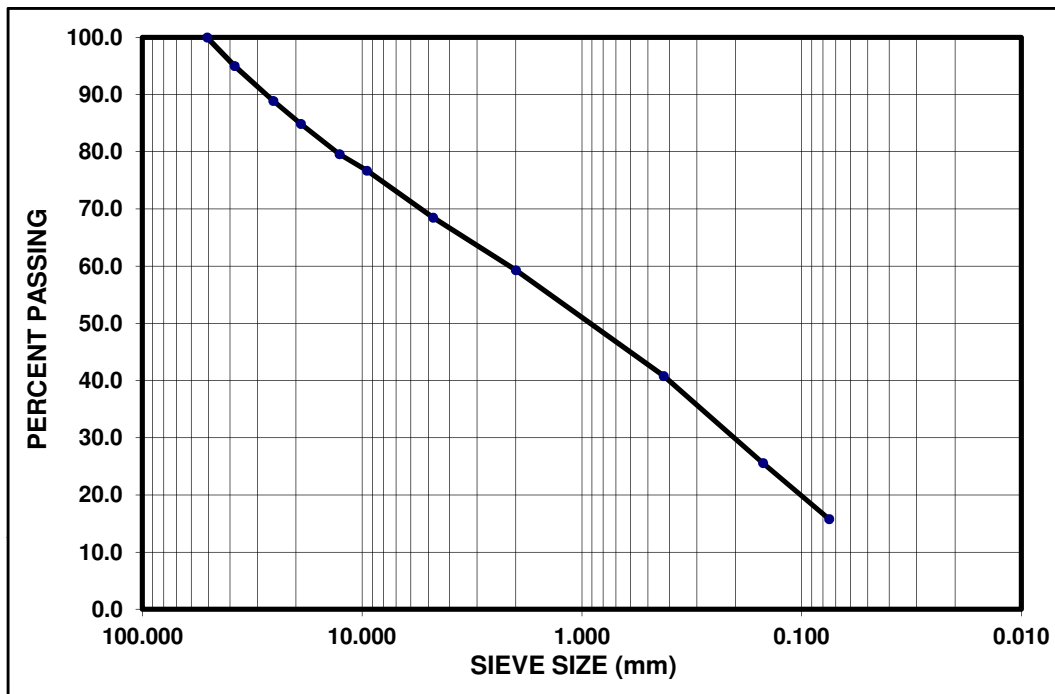
General Notes

1. Test pit terminated at 3.5 m on BEDROCK.
2. Groundwater encountered at 3.0 m depth.
3. Minor sloughing of test pit walls below 2.5 m depth.
4. UTM coordinates obtained using handheld Garmin GPS unit referencing NAD83 Zone 22.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	18-May-12
Project:	Geotechnical Site Investigation Proposed Substation - Soldiers Pond	Date Tested:	24-May-12
Client:	Nalcor Energy	Sample Description:	Gravelly Sand, some Silt and/or Clay
Sampled By:	B. Walsh	Sample Depth:	3.3m - 3.4m
Test Pit ID:	TP-17	Sample Type:	Test Pit
Lab ID No.:	4408_R1		



SIEVE SIZE (mm)	PERCENT PASSING	GRADING LIMITS
50.800	100.0	
38.100	95.0	
25.400	88.9	
19.050	84.9	
12.700	79.6	
9.525	76.7	
4.760	68.5	
2.000	59.3	
0.425	40.8	
0.150	25.6	
0.075	15.8	

% Gravel: 31.5
 % Sand: 52.7
 % Silt / Clay: 15.8

Comments: *The as received moisture content of the sample was determined to be 7.6%.*

Estimated in the field: % Boulder: 1 - 10 % Cobble: 1 - 10

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AMEC Environment & Infrastructure

Per: *[Signature]*

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Test Pit: TP-18

Firm:	Nalcor Energy			Date: May 22, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253389	E 350870
		Inspector: Ian Butt		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.6	TOPSOIL/ROOTMAT – rootlets, organics, loose, dark brown to black, moist.	-	-	-
0.6 – 5.5	TILL – SAND AND GRAVEL, trace to some silt, trace to some cobbles and boulders (cobble and boulder content increases with depth), dense to very dense, light grey, moist to saturated.	Sample A	4.0 – 4.1	Grab
5.5	Test pit terminated at 5.5 m on BEDROCK.	-	-	-
Estimated Cobbles (%) 1 - 20		Estimated Boulders (%) 1 - 20		Estimated Max Diameter (m) 1.0

General Notes

1. Test pit terminated at 5.5 m on BEDROCK.
2. Groundwater encountered at 3.5 m depth.
3. Minor sloughing of test pit walls below 3.5 m depth.
4. Large boulders encountered at surface.
5. UTM coordinates obtained using handheld Garmin GPS unit referencing NAD83 Zone 22.



Test Pit: TP-C

Firm:	Nalcor Energy			Date: May 18, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253456	E 350295
				Inspector: Brad Walsh

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.3	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, abundant surficial cobbles and boulders, loose, dark brown to black, moist.	-	-	-
0.3 – 0.7	WEATHERED TILL – SAND AND GRAVEL, trace to some silt, some cobbles and boulders, oxidized, compact, reddish-brown, moist.	-	-	-
0.7 – 6.5	TILL – SAND AND GRAVEL, trace to some silt, some to abundant cobbles and boulders, very dense, light brown-grey, moist to saturated.	TP-C	3.5 – 4.5	Grab
6.5	Test pit terminated at 6.5 m on BEDROCK.	-	-	-
Estimated Cobbles (%) 25 - 30		Estimated Boulders (%) 25 - 30		Estimated Max Diameter (m) 0.5

General Notes

1. Test pit terminated at 6.5 m on BEDROCK.
2. Test pit dry upon completion.
3. UTM coordinates obtained using handheld Lowrance GPS unit referencing NAD83 Zone 22.



Test Pit: TP-D

Firm:	Nalcor Energy			Date: May 22, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253786	E 350116
		Inspector: Brad Walsh		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.6	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, abundant surficial boulders, loose, dark brown to black, moist.	-	-	-
0.6 – 0.9	WEATHERED TILL – Gravelly SAND, some silt to silty, some cobbles and boulders, loose to compact, red-brown, oxidized, moist.	-	-	-
0.9 – 6.6	TILL – Gravelly SAND, trace to some silt, some cobbles and boulders, compact, light brown to grey, moist.	TP-D	4.0 – 4.5	Grab
6.6	Test pit terminated at 6.6 m on probable BEDROCK.	-	-	-
Estimated Cobbles (%) 20 - 25		Estimated Boulders (%) 15 - 20		Estimated Max Diameter (m) 0.5

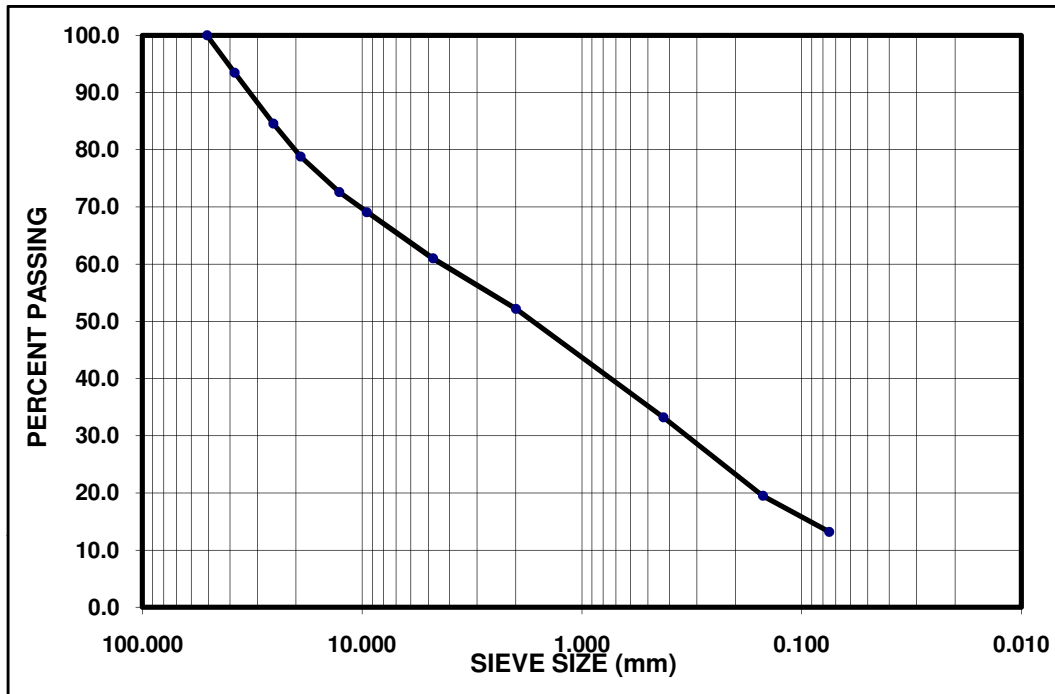
General Notes

1. Test pit terminated at 6.6 m on probable BEDROCK.
2. Test pit dry upon completion.
3. UTM coordinates obtained using handheld Lowrance GPS unit referencing NAD83 Zone 22.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	22-May-12
Project:	Geotechnical Site Investigation Proposed Substation - Soldiers Pond	Date Tested:	24-May-12
Client:	Nalcor Energy	Sample Description:	Sand and Gravel, some Silt and/or Clay
Sampled By:	B. Walsh	Sample Depth:	4.0m-4.5m
Test Pit ID:	TP-D	Sample Type:	Test Pit
Lab ID No.:	4402_R1		



SIEVE SIZE (mm)	PERCENT PASSING	GRADING LIMITS
50.800	100.0	
38.100	93.5	
25.400	84.6	
19.050	78.8	
12.700	72.6	
9.525	69.1	
4.760	61.0	
2.000	52.2	
0.425	33.2	
0.150	19.5	
0.075	13.2	

% Gravel: 39.0
 % Sand: 47.8
 % Silt / Clay: 13.2

Comments: The as received moisture content of the sample was determined to be 6.9%

Estimated in the field: % Boulder: % Cobble:

Reporting of these test results constitutes a testing service only.
 Engineering interpretation or evaluation of the test results is provided only on written request.

AMEC Environment & Infrastructure

Per: *Paula Allison*

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 Fax. (709) 722-5025



MOISTURE DENSITY RELATIONSHIP

Client: Nalcor Energy Project #: TF11104105.1000
 Job Location: Soldiers Pond Substation Lab No: 4402
 Sample Source: TP-D Material: Test Pit

Date Sampled: May 22, 2012 Sampled By: B. Walsh of AMEC

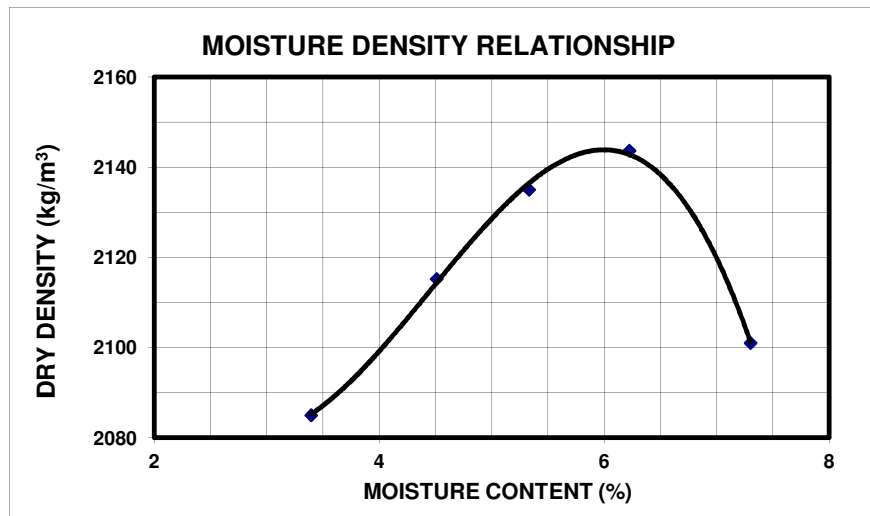
Date Received: May 23, 2012 Preparation:

Moist	Dry
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Percent Retained:	4.75	39.0%	19.05	21.2%
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Compaction Std.	ASTM D698	Method	C
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Moisture Content	3.4	4.5	5.3	6.2	7.3
Dry Density kg/m ³	2085	2115	2135	2144	2101



Oversized Material Correction

	<u>Uncorrected</u>	<u>Corrected</u>
Maximum Dry Density	2144 kg/m ³	2236 kg/m ³
Maximum Moisture	5.9 %	5.0 %

Comments:

AMEC Environment & Infrastructure
 a division of AMEC Americas Ltd

Tested by, J. Fowlow

Reviewed by, DRAFT



Test Pit: TP-E

Firm:	Nalcor Energy			Date: May 22, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253675	E 350107
		Inspector: Brad Walsh		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.5	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, some to abundant surficial boulders, loose, dark brown to black, moist.	-	-	-
0.5 – 0.8	WEATHERED TILL – SAND, some gravel to gravelly, some silt, some cobbles, trace boulders, oxidized, compact, reddish-brown, moist.	-	-	-
0.8 – 4.3	TILL – SAND AND GRAVEL, some silt to silty, some cobbles and boulders, dense, grey, moist to wet.	TP-E	3.5 – 4.0	Grab
4.3 – 4.4	FRACTURED BEDROCK – angular bedrock fragments <0.3 m in diameter.	-	-	-
4.4	Test pit terminated at 4.4 m on BEDROCK.	-	-	-

Estimated Cobbles (%) 15 - 20	Estimated Boulders (%) 15 - 20	Estimated Max Diameter (m) 0.5
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General Notes

1. Test pit terminated at 4.4 m on BEDROCK.
2. Groundwater encountered at 2.8 m depth.
3. UTM coordinates obtained using handheld Lowrance GPS unit referencing NAD83 Zone 22.



Test Pit: TP-F

Firm:	Nalcor Energy			Date: May 22, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253887	E 350074
Inspector: Brad Walsh				

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.6	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, abundant surficial boulders, loose, dark brown to black, moist.	-	-	-
0.6 – 0.9	WEATHERED TILL – Gravelly SAND, trace to some silt, some cobbles and boulders, oxidized, compact, reddish-brown, moist.	-	-	-
0.9 – 3.3	TILL – Gravelly SAND, trace to some silt, some cobbles and boulders, compact, light brown-grey, moist.	TP-F	3.0 – 3.3	Grab
3.3	Test pit terminated at 3.3 m on BEDROCK.	-	-	-
Estimated Cobbles (%) 10 - 15		Estimated Boulders (%) 10 - 15		Estimated Max Diameter (m) 0.5

General Notes

1. Test pit terminated at 3.3 m on BEDROCK.
2. Groundwater seepage encountered at 3.3 m depth.
3. UTM coordinates obtained using handheld Lowrance GPS unit referencing NAD83 Zone 22.



Trench: TR-01

Firm:	Nalcor Energy			Date: May 15, 2012
Project:	Geotechnical Site Investigation - Proposed Station Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253660	E 350566
		Inspector: Brad Walsh		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.4	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, abundant surficial boulders (> 1.5 m in diameter), loose, dark brown to black, moist.	-	-	-
0.4 – 0.8	WEATHERED TILL – Gravelly SAND, trace to some silt, some cobbles, trace to some boulders, oxidized, compact, reddish-brown, moist.	-	-	-
0.8 – 8.8	TILL – Gravelly SAND, trace to some silt, some cobbles and boulders, compact, light brown - grey, moist.	Sample A Sample B	5.5 – 6.5	Grab
8.8 – 9.2	TILL – SAND AND GRAVEL, trace to some silt, some cobbles and boulders, dense, grey, wet.	Sample C Sample D	8.5 8.5	Grab
9.2	BEDROCK encountered at 9.2 m.	-	-	-

Estimated Cobbles (%) 20 - 25	Estimated Boulders (%) 15 - 20	Estimated Max Diameter (m) 1.5
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General Notes

1. BEDROCK encountered at 9.2 m.
2. Groundwater seepage encountered at 8.8 m - 9.0 m depth.
3. Large boulders encountered at surface.
4. UTM coordinates obtained using handheld Garmin GPS unit referencing NAD83 Zone 22.
5. TR-01 is located from 0 - 7 m along trench profile measuring west to east.



Trench: TR-02

Firm:	Nalcor Energy			Date: May 16, 2012
Project:	Geotechnical Site Investigation - Proposed Station Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253653	E 350581
Inspector: Brad Walsh				

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.4	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, abundant surficial boulders (> 1.5 m in diameter), loose, dark brown to black, moist.	-	-	-
0.4 – 0.6	WEATHERED TILL – Gravelly SAND, trace to some silt, some cobbles, trace to some boulders, oxidized, compact, reddish-brown, moist.	-	-	-
0.6 – 8.2	TILL – SAND AND GRAVEL, trace to some silt, some cobbles and boulders, compact, light brown - grey, moist.	Sample A	3.0 – 3.5	Grab
8.2	BEDROCK encountered at 8.2 m.	-	-	-
Estimated Cobbles (%) 10 - 15		Estimated Boulders (%) 10 - 15		Estimated Max Diameter (m) 2.5

General Notes

1. BEDROCK encountered at 8.2 m.
2. Groundwater seepage encountered at 8.0 m - 8.2 m depth.
3. Large boulders encountered at surface.
4. Occasional large boulders (>2 m diameter) excavated from till.
5. UTM coordinates obtained using handheld Garmin GPS unit referencing NAD83 Zone 22.
6. TR-02 is located from 7 - 15 m along trench profile measuring west to east.



Trench: TR-03

Firm:	Nalcor Energy			Date: May 16, 2012
Project:	Geotechnical Site Investigation - Proposed Station Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253654	E 350585
				Inspector: Brad Walsh

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.2	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, abundant surficial boulders (> 1.5 m in diameter), loose, dark brown to black, moist.	-	-	-
0.2 – 0.7	WEATHERED TILL – Gravelly SAND, trace to some silt, some cobbles, trace to some boulders, oxidized, compact, reddish-brown, moist.	-	-	-
0.7 – 8.4	TILL – SAND AND GRAVEL, some silt, some cobbles and boulders, compact, light brown - grey, moist.	Sample A	4.0 – 5.0	Grab
8.4	BEDROCK encountered at 8.4 m.	-	-	-
Estimated Cobbles (%) 25		Estimated Boulders (%) 10 - 15		Estimated Max Diameter (m) 1.5

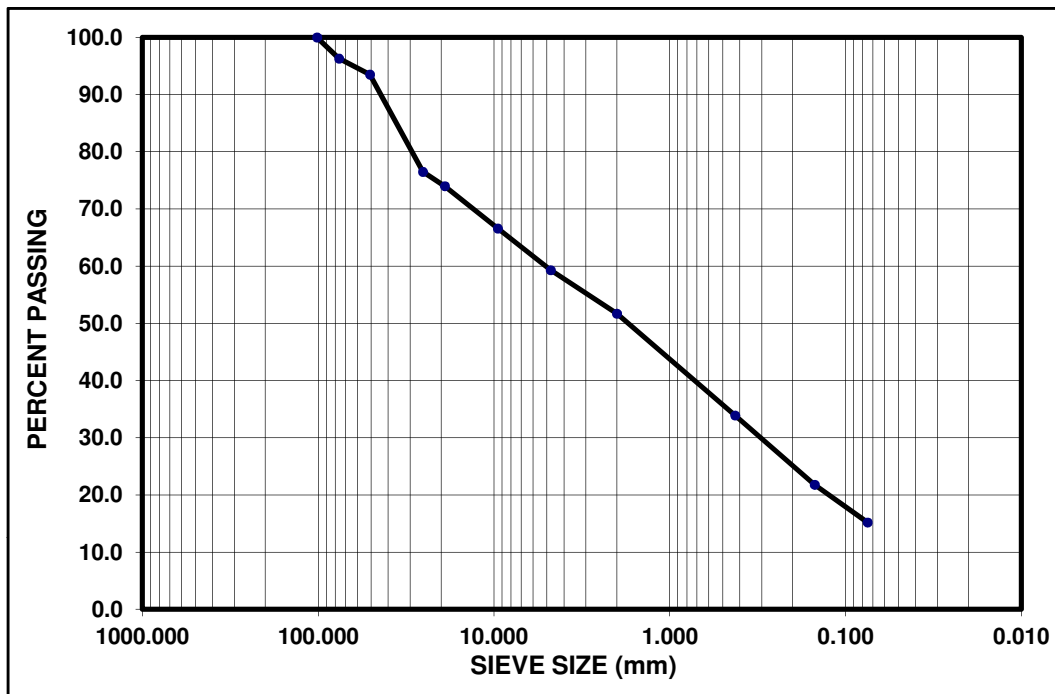
General Notes

1. BEDROCK encountered at 8.4 m.
2. Groundwater seepage encountered at 8.2 m - 8.4 m depth.
3. Large boulders encountered at surface.
4. Occasional large boulders (>1.0 m diameter) excavated from till.
5. UTM coordinates obtained using handheld Garmin GPS unit referencing NAD83 Zone 22.
6. TR-03 is located from 15 - 22 m along trench profile measuring west to east.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	16-May-12
Project:	Geotechnical Site Investigation Proposed Substation - Soldiers Pond	Date Tested:	24-May-12
Client:	Nalcor Energy	Sample Description:	Sand and Gravel, some Silt and/or Clay
Sampled By:	B. Walsh	Sample Depth:	5.5m - 7.0m
Test Pit ID:	TR-03	Sample Type:	Trench
Lab ID No.:	4389_R1		



SIEVE SIZE (mm)	PERCENT PASSING	GRADING LIMITS
101.600	100.0	
76.200	96.3	
50.800	93.5	
25.400	76.5	
19.050	74.0	
9.525	66.6	
4.760	59.3	
2.000	51.7	
0.425	33.9	
0.150	21.8	
0.075	15.2	

% Gravel: 40.7
 % Sand: 44.1
 % Silt / Clay: 15.2

Comments: *The as received moisture content of the sample was determined to be 5.0%*

Estimated in the field: % Boulder: 10 - 15 % Cobble: 25

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 Engineering interpretation or evaluation of the test results is provided only on written request.

AMEC Environment & Infrastructure

Per: *Paradise*

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 Fax. (709) 722-5025



MOISTURE DENSITY RELATIONSHIP

Client: Nalcor Energy Project #: TF11104105.1000
 Job Location: Soldiers Pond Substation Lab No: 4389
 Sample Source: TR-03 Material: Trench

Date Sampled: May 16, 2012 Sampled By: B. Walsh of AMEC

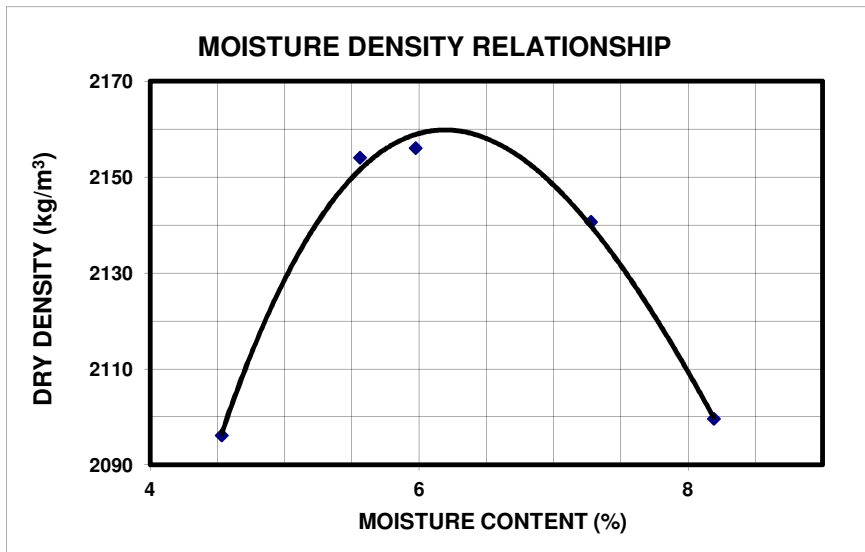
Date Received: May 23, 2012 Preparation:

Moist	Dry
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Percent Retained:	4.75	40.7%	19.05	26.0%
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Compaction Std.	ASTM D698	Method	C
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Moisture Content	4.5	5.6	6.0	7.3	8.2
Dry Density kg/m ³	2096	2154	2156	2141	2100



Oversized Material Correction

	<u>Uncorrected</u>	<u>Corrected</u>
Maximum Dry Density	2160 kg/m ³	2277 kg/m ³
Maximum Moisture	6.2 %	5.0 %

Comments:

AMEC Environment & Infrastructure
 a division of AMEC Americas Ltd

Tested by, J. Fowlow

Reviewed by, DRAFT



Trench: TR-04

Firm:	Nalcor Energy			Date: May 16, 2012
Project:	Geotechnical Site Investigation - Proposed Station Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253656	E 350589
				Inspector: Brad Walsh

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.3	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, abundant surficial boulders (> 1.5 m in diameter), loose, dark brown to black, moist.	-	-	-
0.3 – 0.7	WEATHERED TILL – Gravelly SAND, trace to some silt, some cobbles, trace to some boulders, oxidized, compact, reddish-brown, moist.	-	-	-
0.7 – 7.9	TILL – SAND AND GRAVEL, trace to some silt, some cobbles and boulders, compact, light brown - grey, moist.	-	-	-
7.9	BEDROCK encountered at 7.9 m.	-	-	-
Estimated Cobbles (%) 15 - 20		Estimated Boulders (%) 15		Estimated Max Diameter (m) 1.5

General Notes

1. BEDROCK encountered at 7.9 m.
2. Groundwater seepage encountered at 7.8 m - 7.9 m depth.
3. Large boulders encountered at surface.
4. Occasional large boulders (>1.0 m diameter) excavated from till.
5. UTM coordinates obtained using handheld Garmin GPS unit referencing NAD83 Zone 22.
6. TR-04 is located from 22 - 29 m along trench profile measuring west to east.



Trench: TR-05

Firm:	Nalcor Energy			Date: May 17, 2012
Project:	Geotechnical Site Investigation - Proposed Station Site, Soldiers Pond, NL			
Contract No.:	LC-SB-014	Location:	N 5253655	E 350605
		Inspector: Brad Walsh		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.2	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, abundant surficial boulders (> 1.5 m in diameter), loose, dark brown to black, moist.	-	-	-
0.2 – 0.6	WEATHERED TILL – SAND AND GRAVEL, trace to some silt, some cobbles and boulders, oxidized, compact, reddish-brown, moist.	-	-	-
0.6 – 6.4	TILL – SAND AND GRAVEL, trace to some silt, some cobbles and boulders, compact, light brown - grey, moist.	Sample A Sample B	2.5 – 3.5 4.5 – 5.5	Grab
6.4	BEDROCK encountered at 6.4 m.	-	-	-
Estimated Cobbles (%) 15 - 20		Estimated Boulders (%) 20 - 25		Estimated Max Diameter (m) 1.5

General Notes

1. BEDROCK encountered at 6.4 m.
2. Groundwater seepage encountered at 5.7 m - 6.0 m depth.
3. Till sloughing below water table.
4. Large boulders encountered at surface.
5. UTM coordinates obtained using handheld Garmin GPS unit referencing NAD83 Zone 22.
6. TR-05 is located from 29 - 36 m along trench profile measuring west to east.



APPENDIX B2
CHURCHILL FALLS ITE



Test Pit: TP-12

Firm:	Nalcor Energy			Date: June 8, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931418	E 436596
		Inspector: Brad Walsh		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.3	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.3 – 1.0	WEATHERED TILL – Gravelly SAND, some silt, some cobbles and boulders, oxidized, compact, reddish-brown, moist.	-	-	-
1.0 – 2.0	TILL – SAND and GRAVEL, some silt, some cobbles and boulders, dense, grey-brown, moist.	TP-12	1.5 – 2.0	Grab
2.0 – 2.4	FRACTURED BEDROCK – Fractured, angular pieces of bedrock, < 0.8 m maximum diameter, sand and gravel intermix.	-	-	-
2.4	Test pit terminated at 2.4 m on BEDROCK.			

Estimated Cobbles (%) 10 - 15	Estimated Boulders (%) 10 - 15	Estimated Max Diameter (m) 0.7
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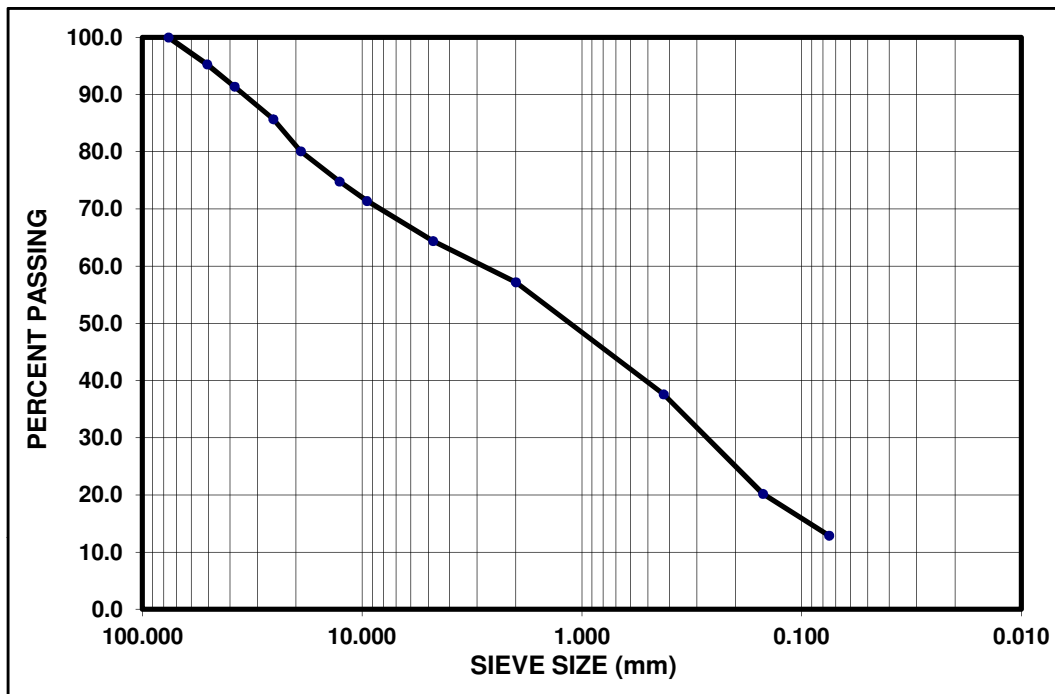
General Notes

1. Test pit terminated at 2.4 m on BEDROCK.
2. Groundwater seepage at the base of excavation (2.4 m depth).
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	8-Jun-12
Project:	Geotechnical Investigations and Resistivity Testing - Sub-Station Sites	Date Tested:	21-Jun-12
Client:	Nalcor Energy - Lower Churchill Project	Sample Description:	Sand and Gravel, some Silt and/or Clay.
Sampled By:	B. Walsh	Sample Depth:	1.5 m - 2.0 m
Test Pit ID:	TP-12	Sample Type:	Test Pit
Lab ID No.:	4602		



SIEVE SIZE (mm)	PERCENT PASSING	GRADING LIMITS
76.200	100.0	
50.800	95.3	
38.100	91.4	
25.400	85.7	
19.050	80.1	
12.700	74.8	
9.525	71.4	
4.760	64.4	
2.000	57.2	
0.425	37.6	
0.150	20.2	
0.075	12.9	

% Gravel: 35.6
 % Sand: 51.5
 % Silt / Clay: 12.9

Comments: The as received moisture content of the sample was determined to be 7.2%.

Estimated in the field: % Boulder: 10 - 15 % Cobble: 10 - 15

Reporting of these test results constitutes a testing service only.
 Engineering interpretation or evaluation of the test results is provided only on written request.

AMEC Environment & Infrastructure

Per:

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 Fax. (709) 722-5025



Test Pit: TP-16

Firm:	Nalcor Energy			Date:	June 9, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL				
Contract No.:	LC-SB-014	Location:	N 5931276	E 436592	Inspector: Brad Walsh

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.2	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.2 – 1.0	WEATHERED TILL – SAND, some gravel to gravelly, some silt, some to abundant surficial boulders, trace rootlets and organic debris, oxidized, compact, reddish-brown, moist.	-	-	-
1.0 – 7.5	TILL – SAND and GRAVEL, some silt, some to abundant cobbles, some boulders, dense, grey, moist.	TP-16	3.5 – 4.5	Grab
7.5 – 7.9	FRACTURED BEDROCK – Fractured, angular pieces of bedrock, < 0.5 m maximum diameter, sand and gravel intermix.	-	-	-
7.9	Test pit terminated at 7.9 m on BEDROCK.			

Estimated Cobbles (%) 25 - 30	Estimated Boulders (%) 15 - 20	Estimated Max Diameter (m) 0.8
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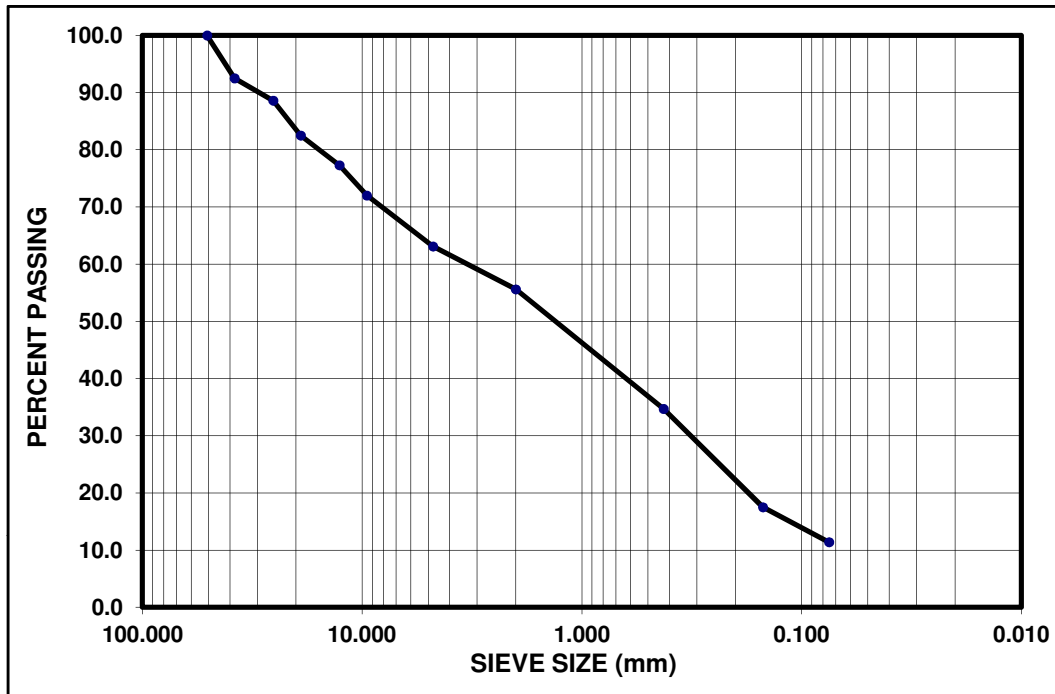
General Notes

1. Test pit terminated at 7.9 m on BEDROCK.
2. Groundwater encountered at an approximate depth of 7.5 m.
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	9-Jun-12
Project:	Geotechnical Investigations and Resistivity Testing - Sub-Station Sites	Date Tested:	19-Jun-12
Client:	Nalcor Energy - Lower Churchill Project	Sample Description:	Sand and Gravel, some Silt and/or Clay.
Sampled By:	B. Walsh	Sample Depth:	3.5 m - 4.5 m
Test Pit ID:	TP-16	Sample Type:	Test Pit
Lab ID No.:	4590		



SIEVE SIZE (mm)	PERCENT PASSING	GRADING LIMITS
50.800	100.0	
38.100	92.5	
25.400	88.6	
19.050	82.5	
12.700	77.3	
9.525	72.0	
4.760	63.1	
2.000	55.6	
0.425	34.7	
0.150	17.5	
0.075	11.4	

% Gravel: 36.9
 % Sand: 51.7
 % Silt / Clay: 11.4

Comments: The as received moisture content of the sample was determined to be 5.2%.

Estimated in the field: % Boulder: 15 - 20 % Cobble: 25 - 30

Reporting of these test results constitutes a testing service only.
 Engineering interpretation or evaluation of the test results is provided only on written request.

AMEC Environment & Infrastructure

Per:

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MOISTURE DENSITY RELATIONSHIP

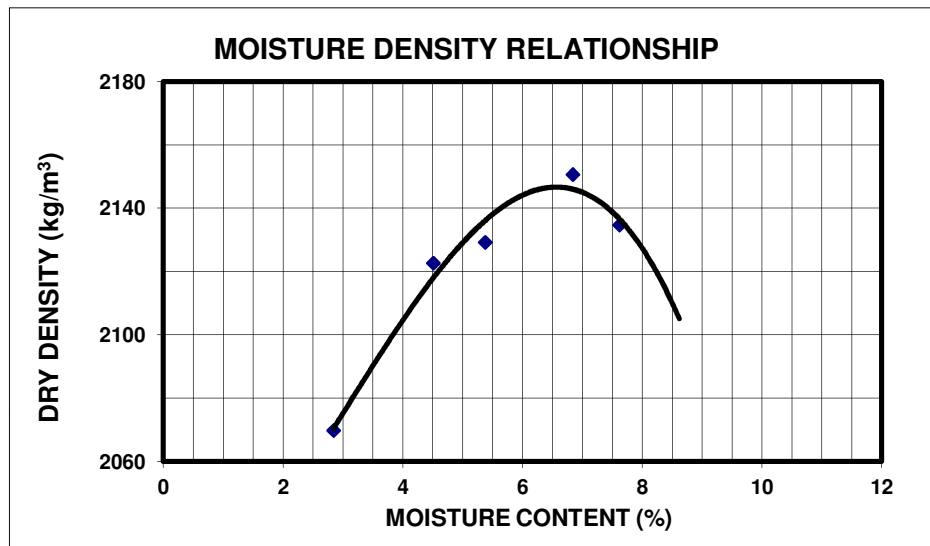
Client: Nalcor Energy Project #: TF11104105.1000
 Job Location: Sub-Station Sites Lab No: 4590
 Sample Source: TP- 16 (3.5 m - 4.5 m) Material: Test Pit

Date Sampled: June 9, 2012 Sampled By: B. Walsh of AMEC
 Date Received: June 26, 2012 Preparation:

	Dry
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Percent Retained:	4.760	36.9%	19.050	17.5%
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Compaction Std.	ASTM D698				Method	C
Moisture Content	2.8	4.5	5.4	6.8	7.6	
Dry Density kg/m ³	2070	2123	2129	2151	2135	



Oversized Material Correction

	<u>Uncorrected</u>	<u>Corrected</u>
Maximum Dry Density	2147 kg/m ³	2222 kg/m ³
Maximum Moisture	6.8 %	5.9 %

Comments:

AMEC Environment & Infrastructure
 a division of AMEC Americas Ltd

Tested by, J. Fowlow Reviewed by, *Dan Cooper*



Test Pit: TP-17

Firm:	Nalcor Energy			Date: June 9, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931250	E 436597
Inspector: Brad Walsh				

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.3	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.3 – 0.9	WEATHERED TILL – SAND, some gravel to gravelly, some silt, some cobbles and boulders, trace rootlets and organic debris, oxidized, loose to compact, reddish-brown, moist.	-	-	-
0.9 – 3.7	TILL – Gravelly SAND, some silt, some cobbles and boulders, dense, grey, moist.	TP-17	2.5 – 3.5	Grab
3.7	Test pit terminated at 3.7 m on BEDROCK.			

Estimated Cobbles (%) 20 - 25	Estimated Boulders (%) 15 - 20	Estimated Max Diameter (m) 0.7
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General Notes

1. Test pit terminated at 3.7 m on BEDROCK.
2. Groundwater seepage at an approximate depth of 3.5 m.
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



Test Pit: TP-18

Firm:	Nalcor Energy			Date: June 8, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931352	E 436675
				Inspector: Brad Walsh

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.3	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.3 – 0.6	WEATHERED TILL – Gravelly SAND, some silt, some to abundant surficial cobbles and boulders, oxidized, loose to compact, reddish-brown, moist.	-	-	-
0.6 – 2.8	TILL – Gravelly SAND, some silt to silty, some to abundant cobbles and boulders, dense, dark brown to grey, moist to wet.	TP-18	1.5 – 2.0	Grab
2.8	Test pit terminated at 2.8 m on BEDROCK.			
Estimated Cobbles (%) 20 - 25		Estimated Boulders (%) 15 - 20		Estimated Max Diameter (m) 1.0

General Notes

1. Test pit terminated at 2.8 m on BEDROCK.
2. Groundwater influx at an approximate depth of 2.3 m.
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



Test Pit: TP-19

Firm:	Nalcor Energy			Date: June 8, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931291	E 436678
				Inspector: Brad Walsh

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.1	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.1 – 0.6	WEATHERED TILL – Gravelly SAND, some silt, some to abundant surficial cobbles and boulders, oxidized, loose to compact, reddish-brown, moist.	-	-	-
0.6 – 2.3	TILL – Gravelly SAND, some silt, some cobbles and boulders, dense, dark brown to grey, moist to wet.	TP-19	1.5 – 2.0	Grab
2.3 – 2.8	FRACTURED BEDROCK – Fractured, angular pieces of bedrock, < 1.0 m maximum diameter, sand and gravel intermix.	-	-	-
2.8	Test pit terminated at 2.8 m on BEDROCK.			

Estimated Cobbles (%) 20 - 25	Estimated Boulders (%) 15 - 20	Estimated Max Diameter (m) 0.8
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General Notes

1. Test pit terminated at 2.8 m on BEDROCK.
2. Groundwater influx at an approximate depth of 1.7 m.
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



Test Pit: TP-20

Firm:	Nalcor Energy			Date:	June 8, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL				
Contract No.:	LC-SB-014	Location:	N 5931221	E 436695	Inspector: Brad Walsh

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.1	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.1 – 1.0	FILL – SAND, some gravel and silt, some to abundant boulders, rootlets and metal debris, loose to compact, brown to grey, moist.	-	-	-
1.0 – 1.9	WEATHERED TILL – Gravelly SAND, some silt, some cobbles, trace to some boulders, compact, trace oxidation staining, reddish brown, moist.	-	-	-
1.9 – 3.5	TILL – Gravelly SAND, some silt, trace to some cobbles and boulders, dense, dark brown to grey, moist to wet.	TP-20	3.0 – 3.5	Grab
3.5	Test pit terminated at 3.5 m on BEDROCK.			

Estimated Cobbles (%) 10 - 15	Estimated Boulders (%) 10	Estimated Max Diameter (m) 0.6
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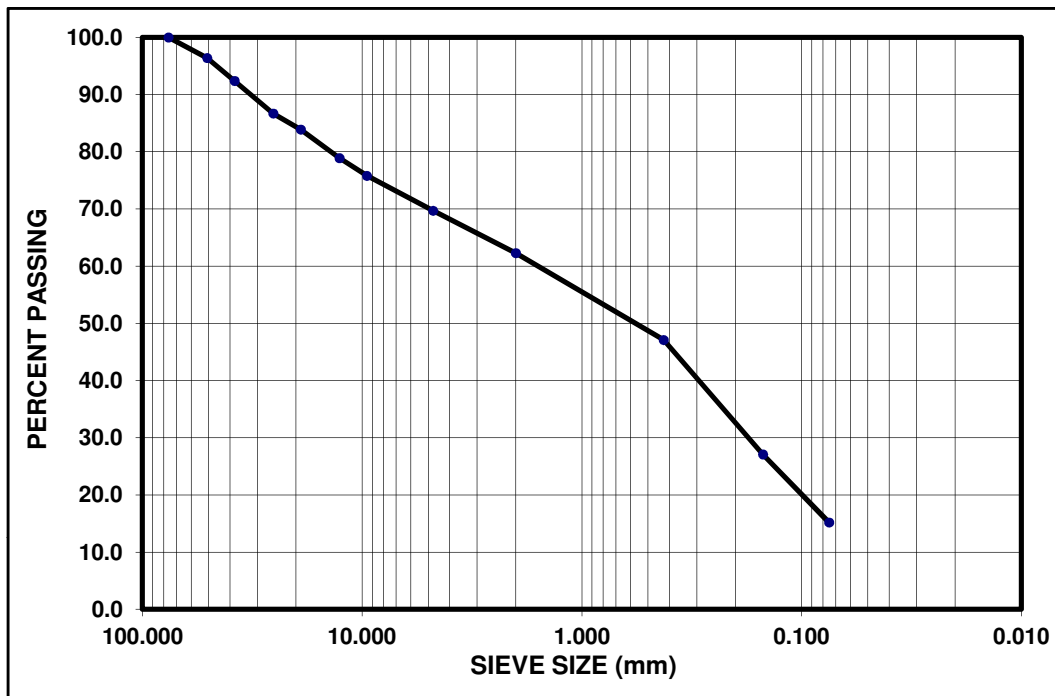
General Notes

1. Test pit terminated at 3.5 m on BEDROCK.
2. Groundwater at an approximate depth of 1.8 – 2.2 m.
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	8-Jun-12
Project:	Geotechnical Investigations and Resistivity Testing - Sub-Station Sites	Date Tested:	22-Jun-12
Client:	Nalcor Energy - Lower Churchill Project	Sample Description:	Gravelly Sand, some Silt and/or Clay.
Sampled By:	B. Walsh	Sample Depth:	3.0 m - 3.5 m
Test Pit ID:	TP-20	Sample Type:	Test Pit
Lab ID No.:	4595		



SIEVE SIZE (mm)	PERCENT PASSING	GRADING LIMITS
76.200	100.0	
50.800	96.4	
38.100	92.4	
25.400	86.7	
19.050	83.9	
12.700	78.9	
9.525	75.8	
4.760	69.7	
2.000	62.3	
0.425	47.1	
0.150	27.1	
0.075	15.2	

% Gravel: 30.3
 % Sand: 54.5
 % Silt / Clay: 15.2

Comments: The as received moisture content of the sample was determined to be 8.0%.

Estimated in the field: % Boulder: 10 % Cobble: 10 - 15

Reporting of these test results constitutes a testing service only.
 Engineering interpretation or evaluation of the test results is provided only on written request.

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 Fax. (709) 722-5025



Test Pit: TP-23

Firm:	Nalcor Energy			Date: June 8, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931287	E 436744
Inspector: Brad Walsh				

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.2	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.2 – 0.6	WEATHERED TILL – Gravelly SAND, some silt to silty, some to abundant surficial cobbles and boulders, trace oxidation staining, loose to compact, reddish brown to grey, moist.	-	-	-
0.6 – 2.3	TILL – Gravelly SAND, some silt to silty, some cobbles and boulders, compact to dense, brown to grey, moist to wet.	-	-	-
2.3	Test pit terminated at 2.3 m on BEDROCK.			

Estimated Cobbles (%) 20 - 25	Estimated Boulders (%) 10 - 15	Estimated Max Diameter (m) 1.5
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General Notes

1. Test pit terminated at 2.3 m on BEDROCK.
2. Groundwater influx at an approximate depth of 1.1 m. Surface water entering test pit at 0.5 m.
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



Test Pit: TP-24

Firm:	Nalcor Energy			Date: June 8, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931357	E 436778
Inspector: Brad Walsh				

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.3	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.3 – 1.0	WEATHERED TILL – Gravelly SAND, some silt to silty, some to abundant surficial cobbles and boulders, compact, trace oxidation staining, reddish brown, moist. Note: From 0.3 m to 0.35 m, layer of light grey silty sand.	-	-	-
1.0 – 3.4	TILL – Gravelly SAND, some silt to silty, some cobbles and boulders, dense, dark brown to grey, moist.	TP-24	2.5 – 3.0	Grab
3.4	Test pit terminated at 3.4 m on BEDROCK.			

Estimated Cobbles (%) 20 - 25	Estimated Boulders (%) 10 - 15	Estimated Max Diameter (m) 0.6
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General Notes

1. Test pit terminated at 3.4 m on BEDROCK.
2. Groundwater seepage at an approximate depth of 2.9 – 3.2 m.
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



Test Pit: TP-26

Firm:	Nalcor Energy			Date: June 8, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931225	E 436784
Inspector: Brad Walsh				

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 1.0	PEAT – rootlets, organic debris, bog, some surficial boulders, loose, dark brown to black, saturated.	-	-	-
1.0 – 1.6	WEATHERED TILL – Gravelly SAND, some silt, some cobbles and boulders, loose to compact, dark brown to reddish-brown, moist.	-	-	-
1.6 – 2.7	TILL – SAND AND GRAVEL, some silt to silty, some cobbles, dense, dark brown to grey, moist to wet.	TP-26	1.5 – 2.0	Grab
2.7	Test pit terminated at 2.7 m on BEDROCK.			

Estimated Cobbles (%) 15 - 20	Estimated Boulders (%) 10 - 15	Estimated Max Diameter (m) 0.6
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General Notes

1. Test pit terminated at 2.7 m on BEDROCK.
2. Excessive surface water influx from the overlying peat – difficult to determine groundwater level.
3. Difficult excavation, material very dense.
4. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



Test Pit: TP-27

Firm:	Nalcor Energy			Date: June 10, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931147	E 435753
Inspector: Brad Walsh				

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.2	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.2 – 0.8	WEATHERED TILL – SAND, some gravel to gravelly, trace to some silt, some surficial cobbles and boulders, oxidized, loose to compact, reddish-brown, moist.	-	-	-
0.8 – 4.1	TILL – Gravelly SAND, some silt, some to abundant cobbles and boulders, dense, brown to grey, moist.	TP-27	3.0 – 3.5	Grab
4.1	Test pit terminated at 4.1 m on BEDROCK.			

Estimated Cobbles (%) 20 - 25	Estimated Boulders (%) 15 - 20	Estimated Max Diameter (m) 0.8
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General Notes

1. Test pit terminated at 4.1 m on BEDROCK.
2. Groundwater seepage at the base of excavation (4.1 m depth).
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



Test Pit: TP-28

Firm:	Nalcor Energy			Date: June 10, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931118	E 435754
Inspector: Brad Walsh				

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.3	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.3 – 0.9	WEATHERED TILL – Silty SAND, some gravel to gravelly, trace to some surficial cobbles and boulders, oxidized, loose to compact, reddish-brown, moist.	-	-	-
0.9 – 4.7	TILL – Silty SAND, some gravel, some cobbles and boulders, dense, grey, moist to wet.	TP-28	3.5 – 4.0	Grab
4.7	Test pit terminated at 4.7 m on BEDROCK.			

Estimated Cobbles (%) 15 - 20	Estimated Boulders (%) 10 - 15	Estimated Max Diameter (m) 0.7
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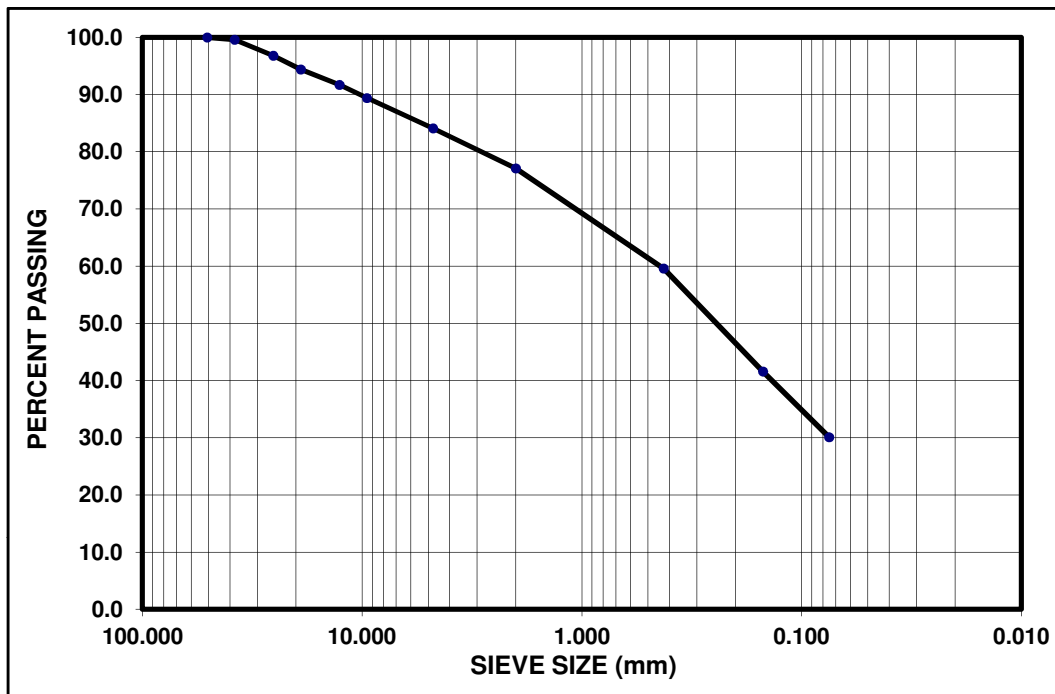
General Notes

1. Test pit terminated at 4.7 m on BEDROCK.
2. Test pit dry upon completion. Test pit walls moist to wet below 3.0 m depth.
3. Test pit walls sloughing during and prior to excavation.
4. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	10-Jun-12
Project:	Geotechnical Investigations and Resistivity Testing - Sub-Station Sites	Date Tested:	25-Jun-12
Client:	Nalcor Energy - Lower Churchill Project	Sample Description:	Silty and/or Clayey Sand, some Gravel.
Sampled By:	B. Walsh	Sample Depth:	3.5 m - 4.0 m
Test Pit ID:	TP-28	Sample Type:	Test Pit
Lab ID No.:	4599		



SIEVE SIZE (mm)	PERCENT PASSING	GRADING LIMITS
50.800	100.0	
38.100	99.6	
25.400	96.8	
19.050	94.4	
12.700	91.7	
9.525	89.4	
4.760	84.1	
2.000	77.1	
0.425	59.6	
0.150	41.6	
0.075	30.1	

% Gravel: 15.9
 % Sand: 54.0
 % Silt / Clay: 30.1

Comments: *The as received moisture content of the sample was determined to be 5.6%.*

Estimated in the field: % Boulder: 10 - 15 % Cobble: 15 - 20

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MOISTURE DENSITY RELATIONSHIP

Client: Nalcor Energy Project #: TF11104105.1000
 Job Location: Sub-Station Sites Lab No: 4599
 Sample Source: TP-28 (3.5 m - 4.0 m) Material: Test Pit

Date Sampled: June 10, 2012 Sampled By: B. Walsh of AMEC

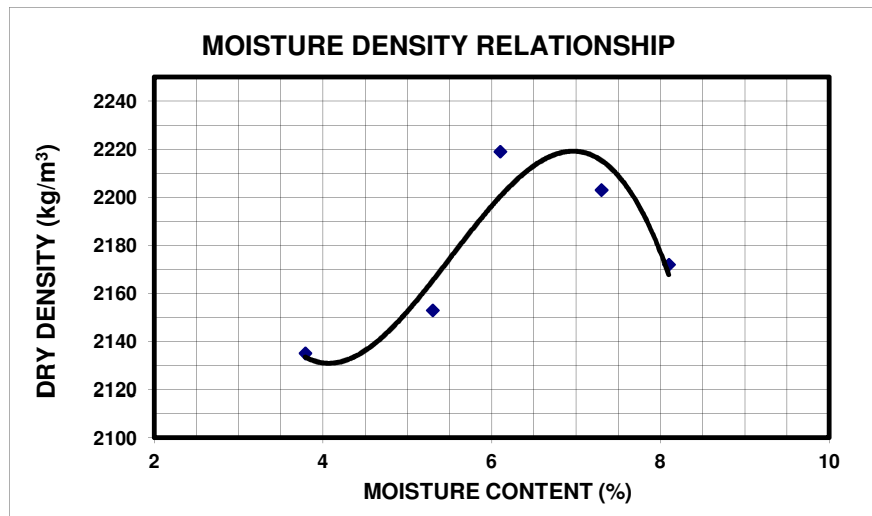
Date Received: June 26, 2012 Preparation:

	Dry
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Percent Retained:	4.760	15.9%	9.525	10.6%
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Compaction Std.	ASTM D698	Method	B
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Moisture Content	3.8	5.3	6.1	7.3	8.1
Dry Density kg/m ³	2135	2153	2219	2203	2172



Oversized Material Correction

	<u>Uncorrected</u>	<u>Corrected</u>
Maximum Dry Density	2220 kg/m ³	2260 kg/m ³
Maximum Moisture	7.0 %	6.4 %

Comments:

AMEC Environment & Infrastructure
 a division of AMEC Americas Ltd

Tested by, J. Fowlow Reviewed by, *Dan Ciprian*



Test Pit: TP-A

Firm:	Nalcor Energy			Date: June 9, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931278	E 436852
		Inspector: Brad Walsh		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.7	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.7 – 1.6	WEATHERED TILL – SAND AND GRAVEL, some silt, some to abundant cobbles and boulders, trace to some organic debris, trace oxidation staining, compact, dark brown to reddish-brown, moist.	-	-	-
1.6 – 4.4	TILL – Silty SAND AND GRAVEL, some to abundant cobbles and boulders, dense, grey, moist to wet.	TP-A	3.5 – 4.0	Grab
4.4	Test pit terminated at 4.4 m on BEDROCK.			

Estimated Cobbles (%) 25 - 30	Estimated Boulders (%) 20 - 25	Estimated Max Diameter (m) 0.9
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General Notes

1. Test pit terminated at 4.4 m on BEDROCK.
2. Groundwater seepage at the base of the excavation (4.4 m depth).
3. Test pit walls wet below 2.5 - 3.0 m depth.
4. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



Test Pit: TP-B

Firm:	Nalcor Energy			Date: June 9, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931328	E 436867
		Inspector: Brad Walsh		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.1	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.1 – 0.9	WEATHERED TILL – Gravelly SAND, some silt, some surficial cobbles and boulders, trace oxidation staining, loose to compact, reddish-brown, moist.	-	-	-
0.9 – 2.6	TILL – Gravelly SAND, some silt, some cobbles and boulders, dense, dark brown to grey, moist.	-	-	-
2.6	Test pit terminated at 2.6 m on BEDROCK.			
Estimated Cobbles (%) 15 - 20		Estimated Boulders (%) 10 - 15		Estimated Max Diameter (m) 0.9

General Notes

1. Test pit terminated at 2.6 m on BEDROCK.
2. Groundwater influx at an approximate depth of 2.5 m.
3. Groundwater seepage in test pit walls below 1.8 m depth.
4. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



Test Pit: TP-C

Firm:	Nalcor Energy			Date: June 9, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931370	E 436872
				Inspector: Brad Walsh

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.1	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.1 – 0.6	WEATHERED TILL – Gravelly SAND, some silt, some to abundant surficial cobbles and boulders, trace oxidation staining, loose to compact, reddish-brown, moist.	-	-	-
0.6 – 3.1	TILL –SAND and GRAVEL, some silt, some to abundant cobbles and boulders, dense, dark brown to grey, moist.	TP-C	2.5 – 3.0	Grab
3.1	Test pit terminated at 3.1 m on BEDROCK.			
Estimated Cobbles (%) 25 - 30		Estimated Boulders (%) 20 - 25		Estimated Max Diameter (m) 0.8

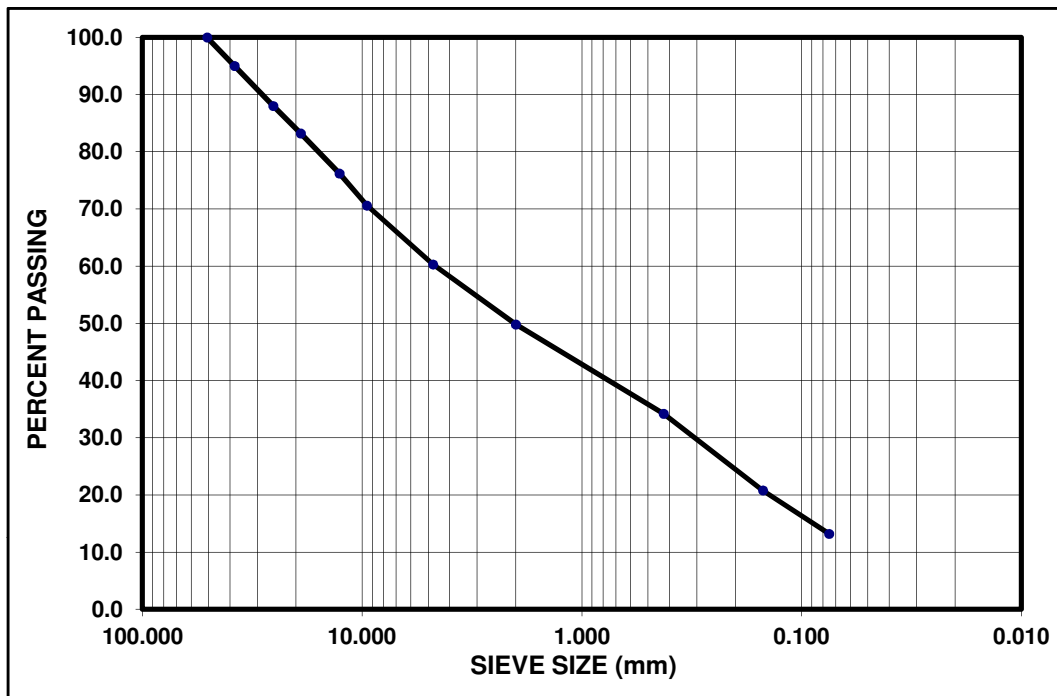
General Notes

1. Test pit terminated at 3.1 m on BEDROCK.
2. Groundwater seepage at an approximate depth of 2.8 m.
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	9-Jun-12
Project:	Geotechnical Investigations and Resistivity Testing - Sub-Station Sites	Date Tested:	19-Jun-12
Client:	Nalcor Energy - Lower Churchill Project	Sample Description:	Sand and Gravel, some Silt and/or Clay.
Sampled By:	B. Walsh	Sample Depth:	2.5 m - 3.0 m
Test Pit ID:	TP-C	Sample Type:	Test Pit
Lab ID No.:	4588		



SIEVE SIZE (mm)	PERCENT PASSING	GRADING LIMITS
50.800	100.0	
38.100	95.0	
25.400	88.0	
19.050	83.2	
12.700	76.2	
9.525	70.6	
4.760	60.3	
2.000	49.8	
0.425	34.2	
0.150	20.8	
0.075	13.2	

% Gravel: 39.7
 % Sand: 47.1
 % Silt / Clay: 13.2

Comments: *The as received moisture content of the sample was determined to be 5.9%*

Estimated in the field: % Boulder: 20 - 25 % Cobble: 25 - 30

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Test Pit: TP-D

Firm:	Nalcor Energy			Date: June 9, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931328	E 437118
Inspector: Brad Walsh				

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.2	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.2 – 0.8	WEATHERED TILL – Gravelly SAND, some silt to silty, some to abundant surficial cobbles and boulders, oxidized, loose to compact, reddish-brown, moist.	-	-	-
0.8 – 5.3	TILL – SAND and GRAVEL, some silt, some to abundant cobbles and boulders, dense, grey, moist.	TP-D	4.0 – 5.0	Grab
5.3 – 6.1	FRACTURED BEDROCK – Fractured, angular pieces of bedrock, < 0.6 m maximum diameter, sand and gravel intermix.	-	-	-
6.1	Test pit terminated at 6.1 m in FRACTURED BEDROCK.			

Estimated Cobbles (%) 25 - 30	Estimated Boulders (%) 20 - 25	Estimated Max Diameter (m) 1.0
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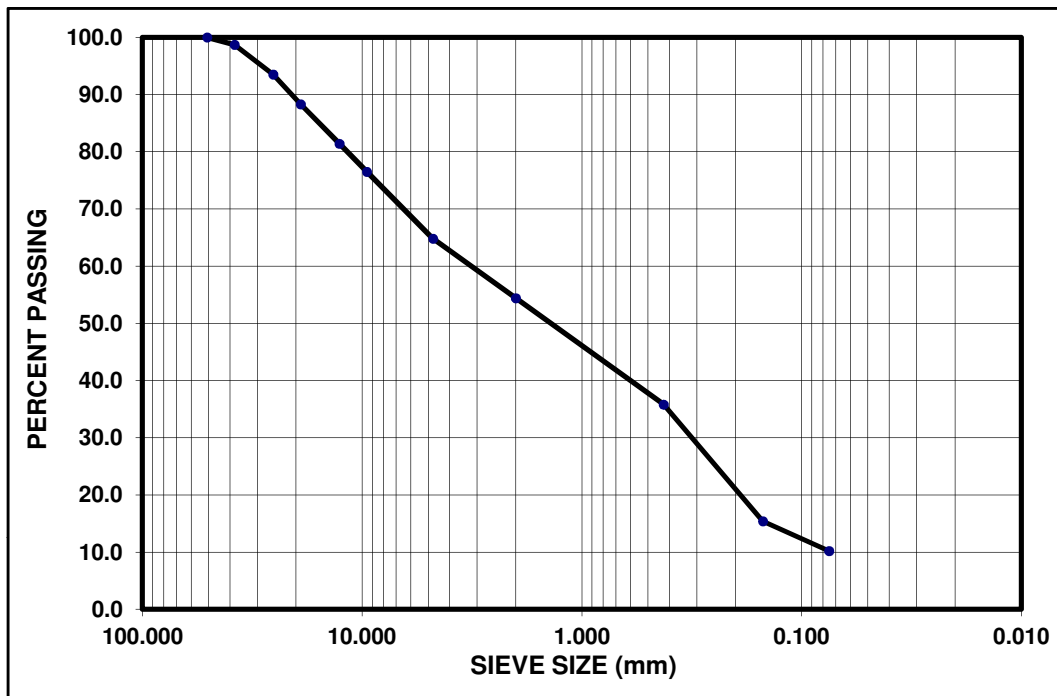
General Notes

1. Test pit terminated at 6.1 m in FRACTURED BEDROCK.
2. Groundwater influx at an approximate depth of 4.8 m.
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	9-Jun-12
Project:	Geotechnical Investigations and Resistivity Testing - Sub-Station Sites	Date Tested:	21-Jun-12
Client:	Nalcor Energy - Lower Churchill Project	Sample Description:	Sand and Gravel, some Silt and/or Clay.
Sampled By:	B. Walsh	Sample Depth:	4.0 m - 5.0 m
Test Pit ID:	TP-D	Sample Type:	Test Pit
Lab ID No.:	4600		



SIEVE SIZE (mm)	PERCENT PASSING	GRADING LIMITS
50.800	100.0	
38.100	98.7	
25.400	93.5	
19.050	88.3	
12.700	81.4	
9.525	76.5	
4.760	64.8	
2.000	54.4	
0.425	35.8	
0.150	15.4	
0.075	10.2	

% Gravel: 35.2
 % Sand: 54.6
 % Silt / Clay: 10.2

Comments: The as received moisture content of the sample was determined to be 6.3%.

Estimated in the field: % Boulder: 20 - 25 % Cobble: 25 - 30

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AMEC Environment & Infrastructure

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 Fax. (709) 722-5025



Test Pit: TP-E

Firm:	Nalcor Energy			Date: June 9, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931438	E 437091
		Inspector: Brad Walsh		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.5	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.5 – 1.5	WEATHERED TILL – Sandy SILT, trace to some gravel, trace cobbles and boulders, medium plastic, moist, red to brown.	-	-	-
1.5 – 3.3	TILL – Silty SAND AND GRAVEL, trace to some cobbles and boulders, moist, dense, grey (wet below 2.5 m depth).	TP-E	2.5 – 3.0	Grab
3.3 – 3.9	FRACTURED BEDROCK – Fractured angular pieces of bedrock, < 1.0 m maximum diameter, sand and gravel intermix.	-	-	-
3.9	Test pit terminated at 3.9 m on BEDROCK.			

Estimated Cobbles (%) 10 - 15	Estimated Boulders (%) 10	Estimated Max Diameter (m) 0.5
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General Notes

1. Test pit terminated at 3.9 m in BEDROCK.
2. Surface water influx at 0.5 m depth.
3. Groundwater influx at an approximate depth of 3.5 m.
4. Test pit walls wet below 2.5 m depth.
5. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



Test Pit: TP-F

Firm:	Nalcor Energy			Date: June 9, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931378	E 437108
				Inspector: Brad Walsh

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.4	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.4 – 1.3	WEATHERED TILL – Gravelly SAND, some silt, some cobbles and boulders, oxidized, compact, reddish-brown, moist.	-	-	-
1.3 – 1.9	TILL – Gravelly SAND, some silt, some to abundant cobbles and boulders, dense, grey, moist.	-	-	-
1.9	Test pit terminated at 1.9 m on BEDROCK.			
Estimated Cobbles (%) 20 - 25		Estimated Boulders (%) 25 - 30		Estimated Max Diameter (m) 1.0

General Notes

1. Test pit terminated at 1.9 m on BEDROCK.
2. Groundwater seepage at the base of excavation (1.9 m depth).
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



Test Pit: TP-G

Firm:	Nalcor Energy			Date: June 9, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931257	E 436369
Inspector: Brad Walsh				

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.3	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.3 – 1.1	WEATHERED TILL – Sandy SILT, trace to some gravel, trace cobbles and boulders, medium plastic, moist, red to brown.	-	-	-
1.1 – 2.8	TILL – Silty, Gravelly SAND, trace to some cobbles and boulders, wet, dense, grey.	TP-G	1.5 – 2.5	Grab
2.8 – 3.2	FRACTURED BEDROCK – Fractured angular pieces of bedrock, < 0.7 m maximum diameter, sand and gravel intermix.	-	-	-
3.2	Test pit terminated at 3.2 m on BEDROCK.			

Estimated Cobbles (%) 10 - 15	Estimated Boulders (%) 10	Estimated Max Diameter (m) 0.5
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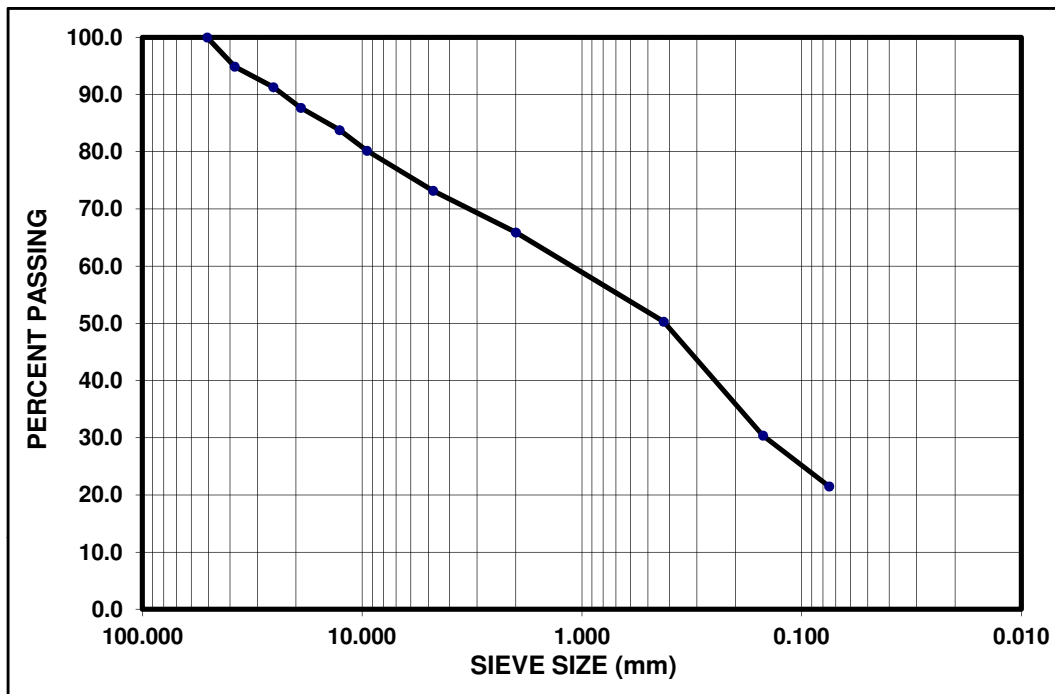
General Notes

1. Test pit terminated at 3.2 m on BEDROCK.
2. Excessive groundwater influx at an approximate depth of 1.0 m.
3. Test pit walls sloughing during excavation.
4. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	n / a
Project:	Geotechnical Investigations and Resistivity Testing - Sub-Station Sites	Date Tested:	19-Jun-12
Client:	Nalcor Energy - Lower Churchill Project	Sample Description:	Gravelly and Silty and/or Clayey Sand.
Sampled By:	B. Walsh	Sample Depth:	1.5 m - 2.5 m
Test Pit ID:	TP-G	Sample Type:	Test Pit
Lab ID No.:	4601		



SIEVE SIZE (mm)	PERCENT PASSING	GRADING LIMITS
50.800	100.0	
38.100	94.9	
25.400	91.3	
19.050	87.7	
12.700	83.8	
9.525	80.2	
4.760	73.2	
2.000	65.9	
0.425	50.3	
0.150	30.4	
0.075	21.5	

% Gravel: 26.8
 % Sand: 51.7
 % Silt / Clay: 21.5

Comments: *The as received moisture content of the sample was determined to be 7.3 %.*

Estimated in the field: % Boulder: 10 % Cobble: 10 - 15

Reporting of these test results constitutes a testing service only.
 Engineering interpretation or evaluation of the test results is provided only on written request.

AMEC Environment & Infrastructure

Per:

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 133 Crosbie Road
 P.O. Box 13216, St John's NL
 Canada, A1B 4A5
 Tel. (709) 722-7023
 Fax. (709) 722-7353

Construction Materials Laboratory
 36 Pippy Place
 P.O. Box 13216, St. John's NL
 Canada, A1B 3X2
 Tel. (709) 722-5062
 Fax. (709) 722-5025



MOISTURE DENSITY RELATIONSHIP

Client: Nalcor Energy Project #: TF11104105.1000
 Job Location: Sub-Station Sites Lab No: 4601
 Sample Source: TP-G (1.5 m - 2.5 m) Material: Test Pit

Date Sampled: n / a Sampled By: B. Walsh of AMEC

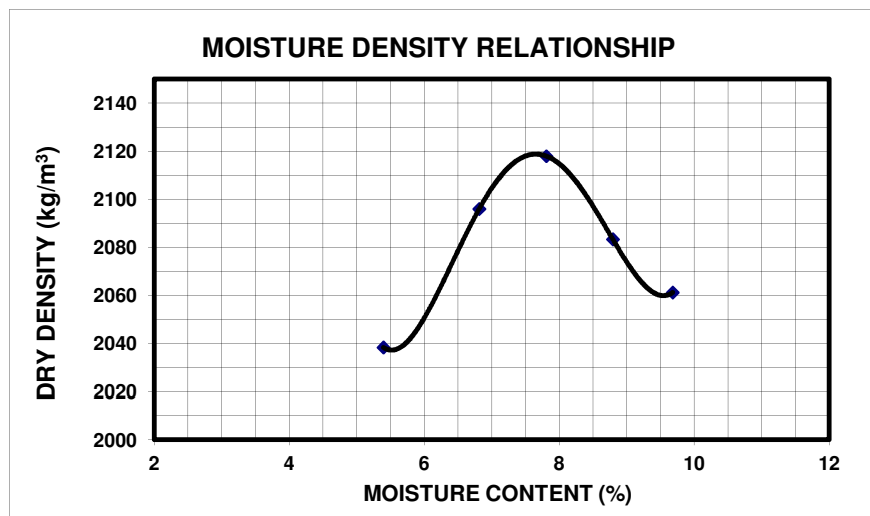
Date Received: June 26, 2012 Preparation:

	Dry
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Percent Retained:	4.760	26.8%	9.525	19.8%
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Compaction Std.	ASTM D698	Method	B
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Moisture Content	5.4	6.8	7.8	8.8	9.7
Dry Density kg/m ³	2038	2096	2118	2083	2061



Oversized Material Correction

	<u>Uncorrected</u>	<u>Corrected</u>
Maximum Dry Density	2119 kg/m ³	2208 kg/m ³
Maximum Moisture	7.7 %	6.5 %

Comments:

AMEC Environment & Infrastructure
 a division of AMEC Americas Ltd

Tested by, J. Fowlow

Reviewed by, *Darrin Cooper*



Test Pit: TP-H

Firm:	Nalcor Energy			Date: June 10, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931317	E 436387
				Inspector: Brad Walsh

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.2	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.2 – 0.5	WEATHERED TILL – Gravelly SAND, some silt, some surficial cobbles and boulders, trace rootlets, oxidized, compact, reddish-brown, moist.	-	-	-
0.5 – 4.1	TILL – SAND AND GRAVEL, some silt, some to abundant cobbles, some boulders, dense, grey, moist. Below 3.3 m depth, reddish - brown.	TP-H	3.5 – 4.0	Grab
4.1 – 4.4	FRACTURED BEDROCK – Fractured angular pieces of bedrock, < 0.5 m maximum diameter, sand and gravel intermix.	-	-	-
4.4	Test pit terminated at 4.4 m on BEDROCK.			

Estimated Cobbles (%) 25-30	Estimated Boulders (%) 20-25	Estimated Max Diameter (m) 0.9
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General Notes

1. Test pit terminated at 4.4 m on BEDROCK.
2. Groundwater influx at an approximate depth of 4.0 m.
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



Test Pit: TP-I

Firm:	Nalcor Energy			Date: June 10, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931189	E 436365
		Inspector: Brad Walsh		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.2	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.2 – 0.7	WEATHERED TILL – Gravelly SAND, some silt, some surficial cobbles and boulders, trace rootlets, oxidized, loose to compact, reddish-brown, moist.	-	-	-
0.7 – 4.2	TILL – SAND AND GRAVEL, trace silt, some to abundant cobbles and boulders, dense, dark brown to grey, moist.	-	-	-
4.2	Test pit terminated at 4.2 m on BEDROCK.			
Estimated Cobbles (%) 25 - 30		Estimated Boulders (%) 20 - 25		Estimated Max Diameter (m) 1.2

General Notes

1. Test pit terminated at 4.2 m on BEDROCK.
2. Groundwater seepage at the base of excavation (4.2 m depth).
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



Test Pit: TP-J

Firm:	Nalcor Energy			Date: June 10, 2012
Project:	Geotechnical Site Investigation – Proposed Site, Churchill Falls, NL			
Contract No.:	LC-SB-014	Location:	N 5931131	E 436360
				Inspector: Brad Walsh

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.1	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.1 – 0.8	WEATHERED TILL – SAND, some gravel to gravelly, some silt, some to abundant surficial cobbles and boulders, oxidized, loose to compact, reddish-brown, moist.	-	-	-
0.8 – 4.2	TILL – Gravelly SAND, some silt to silty, some to abundant cobbles and boulders, dense, grey-brown, moist.	TP-J	3.0 – 3.5	Grab
4.2 – 4.4	FRACTURED BEDROCK – Fractured, angular pieces of bedrock, < 0.3 m maximum diameter, sand and gravel intermix.	-	-	-
4.4	Test pit terminated at 4.4 m on BEDROCK.			

Estimated Cobbles (%) 15 - 20 Estimated Boulders (%) 15 - 20 Estimated Max Diameter (m) 0.9

General Notes

1. Test pit terminated at 4.4 m on BEDROCK.
2. Groundwater influx at the base of excavation (4.4 m depth).
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 20.



APPENDIX B3
SHOAL COVE SITE



Test Pit: TP-01

Firm:	Nalcor Energy			Date: June 15, 2012
Project:	Geotechnical Site Investigation - Proposed Site, Shoal Cove, NL			
Contract No.:	LC-SB-014	Location:	N 5690223	E 525583
		Inspector: Brad Walsh		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.6	PEAT – rootlets, organic debris, bog, loose, dark brown to black, moist.	-	-	-
0.6 – 1.9	MARINE SEDIMENT – Sandy, Gravelly SILT, trace clay, trace shells, nonplastic, firm, beige to grey, moist.	TP-01	1.5 – 1.9	Grab
1.9	Test pit terminated at 1.9 m on BEDROCK.			

Estimated Cobbles (%) -

Estimated Boulders (%) -

Estimated Max Diameter (m) -

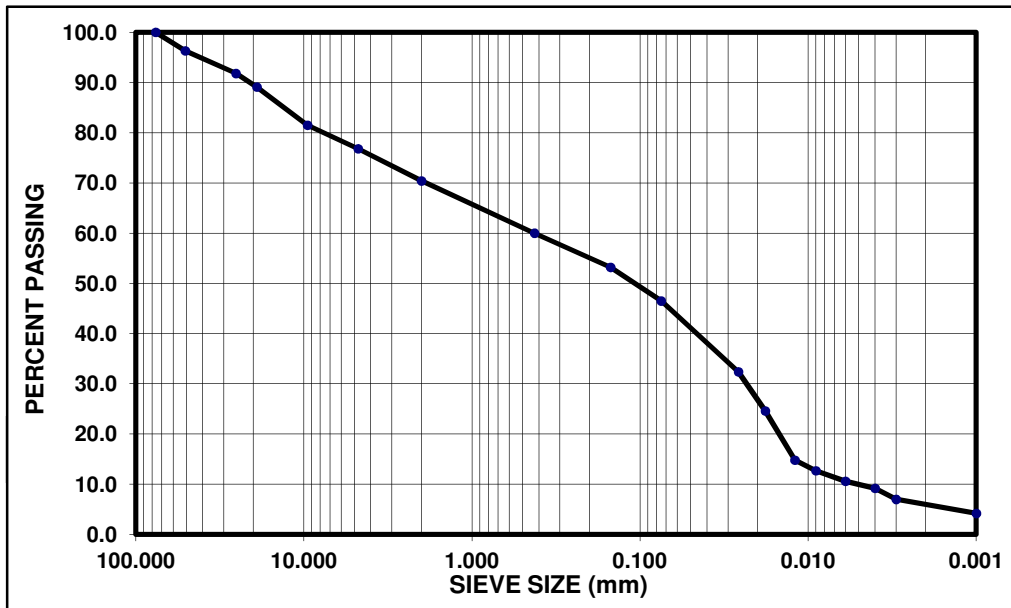
General Notes

1. Test pit terminated at 5.3 m on BEDROCK.
2. Groundwater seepage at the base of the excavation (1.9 m depth).
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 21.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	15-Jun-12
Project:	Geotechnical Investigations and Resistivity Testing - Sub-Station Sites	Date Tested:	20-Jun-12
Client:	Nalcor Energy - Lower Churchill Project	Sample Description:	Sandy, Gravelly Silt, trace Clay
Sampled By:	B. Walsh	Sample Depth:	1.5 m - 1.9 m
Test Pit ID:	TP-01	Sample Type:	Test Pit
Lab ID No.:	4589		



SIEVE SIZE (mm)	PERCENT PASSING	Material	%
76.200	100.0	Gravel	23.2
50.800	96.3		
25.400	91.8		
19.050	89.1		
9.525	81.5		
4.760	76.8	Sand	30.3
2.000	70.4		
0.425	60.0		
0.150	53.2	Silt	43.8
0.075	46.5		
0.0260	32.4		
0.0180	24.6		
0.0120	14.8		
0.0090	12.7		
0.0060	10.6	Clay	2.7
0.0040	9.2		
0.0030	7.0		
0.0010	4.2		

ATTERBERG LIMITS	
Liquid Limit	NA
Plastic Limit	Non Plastic
Plasticity Index	NA

Comments: The as received moisture content of the sample was determined to be 24.7%.

Estimated in the field: % Boulder: n / a % Cobble: n / a

AMEC Environment & Infrastructure

Per: *Pauline*

Reporting of these test results constitutes a testing service only.
Engineering interpretation or evaluation of the test results is provided only on written request.

Construction Materials Laboratory
36 Pippy Place
St. John's, NL Canada A1B 3X2
Tel. (709) 722-5062
Fax. (709) 722-5025



Test Pit: TP-02

Firm:	Nalcor Energy			Date: June 15, 2012
Project:	Geotechnical Site Investigation - Proposed Site, Shoal Cove, NL			
Contract No.:	LC-SB-014	Location:	N 5690076	E 525584
				Inspector: Brad Walsh

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.3	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.3 – 0.9	WEATHERED MARINE SEDIMENT– Silty, Gravelly SAND, some clay , loose to compact, light brown, moist.	-	-	-
0.9 – 1.4	MARINE SEDIMENT– Silty, Gravelly SAND, some clay, trace shells, low plasticity, firm, brown to grey, moist.	TP-02	1.0 – 1.2	Grab
1.4 – 1.9	FRACTURED BEDROCK – Fractured, angular pieces of bedrock, < 0.5 m maximum diameter, sand, silt and gravel intermix.	-	-	-
1.9	Test pit terminated at 1.9 m on BEDROCK.			

Estimated Cobbles (%) -

Estimated Boulders (%) -

Estimated Max Diameter (m) -

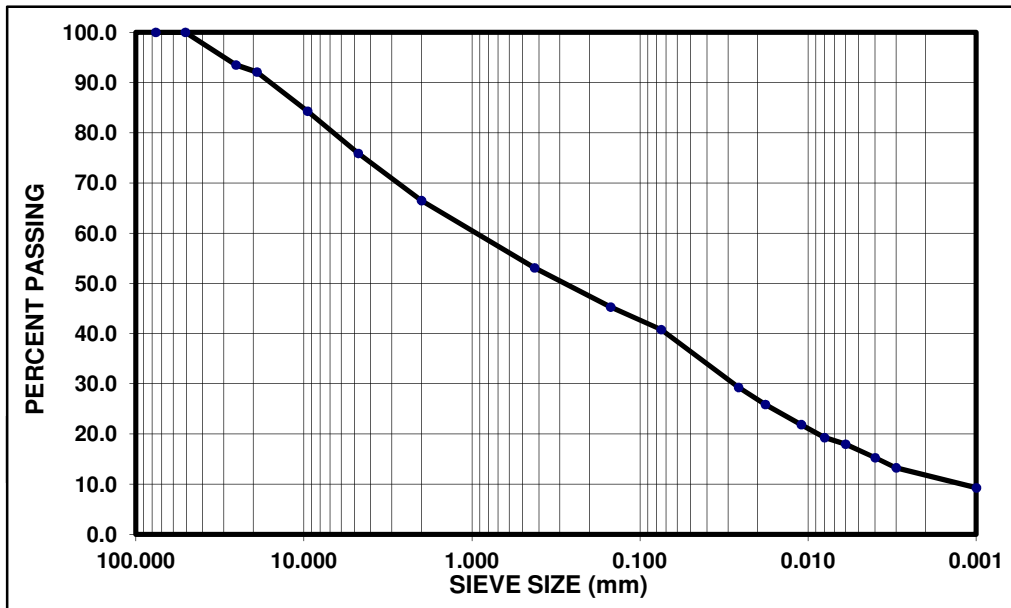
General Notes

1. Test pit terminated at 1.9 m on BEDROCK.
2. Test pit dry upon completion. Surface water influx at an approximate depth of 0.5 m.
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 21.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	15-Jun-12
Project:	Geotechnical Investigations and Resistivity Testing - Sub-Station Sites	Date Tested:	20-Jun-12
Client:	Nalcor Energy - Lower Churchill Project	Sample Description:	Silty, Gravelly Sand, some Clay
Sampled By:	B. Walsh	Sample Depth:	1.0 m - 1.2 m
Test Pit ID:	TP-02	Sample Type:	Test Pit
Lab ID No.:	4591		



SIEVE SIZE (mm)	PERCENT PASSING	Material	%
76.200	100.0	Gravel	24.1
50.800	100.0		
25.400	93.5		
19.050	92.1		
9.525	84.3		
4.760	75.9	Sand	35.1
2.000	66.5		
0.425	53.1		
0.150	45.3		
0.075	40.8	Silt	28.8
0.0260	29.3		
0.0180	25.9		
0.0110	21.9		
0.0080	19.3		
0.0060	18.0		
0.0040	15.3	Clay	12.0
0.0030	13.3		
0.0010	9.3		

ATTERBERG LIMITS	
Liquid Limit	25.7
Plastic Limit	18.7
Plasticity Index	7.0

Comments: The as received moisture content of the sample was determined to be 12.7%.

Estimated in the field: % Boulder: n / a % Cobble: n / a

AMEC Environment & Infrastructure

Per: *[Signature]*

Reporting of these test results constitutes a testing service only.
Engineering interpretation or evaluation of the test results is provided only on written request.

Construction Materials Laboratory
36 Pippy Place
St. John's, NL Canada A1B 3X2
Tel. (709) 722-5062
Fax. (709) 722-5025



Test Pit: TP-03

Firm:	Nalcor Energy			Date: June 16, 2012
Project:	Geotechnical Site Investigation - Proposed Site, Shoal Cove, NL			
Contract No.:	LC-SB-014	Location:	N 5690217	E 525635
		Inspector: Brad Walsh		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.2	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.2 – 0.4	WEATHERED MARINE SEDIMENT– SILT AND SAND, trace to some clay, trace gravel, trace cobbles, loose to compact, slightly plastic, light brown, moist.	-	-	-
0.4 – 2.0	MARINE SEDIMENT– Clayey SILT, some sand to sandy, some rounded gravel, trace to some cobbles and boulders, trace sea shells, slightly plastic, firm, grey, moist.	TP-03	1.0 – 1.5	Grab
2.0	Test pit terminated at 2.0 m on BEDROCK.			
Estimated Cobbles (%) 10		Estimated Boulders (%) 10		Estimated Max Diameter (m) 0.3

General Notes

1. Test pit terminated at 2.0 m on BEDROCK.
2. Groundwater influx at an approximate depth of 1.0 m.
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 21.



Test Pit: TP-04

Firm:	Nalcor Energy			Date: June 16, 2012
Project:	Geotechnical Site Investigation - Proposed Site, Shoal Cove, NL			
Contract No.:	LC-SB-014	Location:	N 5690262	E 525664
				Inspector: Brad Walsh

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.5	PEAT – rootlets, organic rich soil, bog, loose, dark brown to black, moist.	-	-	-
0.5 – 0.8	WEATHERED MARINE SEDIMENT– SAND and GRAVEL, some silt, trace clay, firm, nonplastic, grey, moist.	-	-	-
0.8 – 1.4	MARINE SEDIMENT– SAND and GRAVEL, some silt, trace clay, trace to some cobbles and boulders, nonplastic, compact, grey, moist.	TP-04	1.0 –1.4	Grab
1.4	Test pit terminated at 1.4 m on BEDROCK.			
Estimated Cobbles (%) 10 - 15		Estimated Boulders (%) 5 - 10		Estimated Max Diameter (m) 0.3

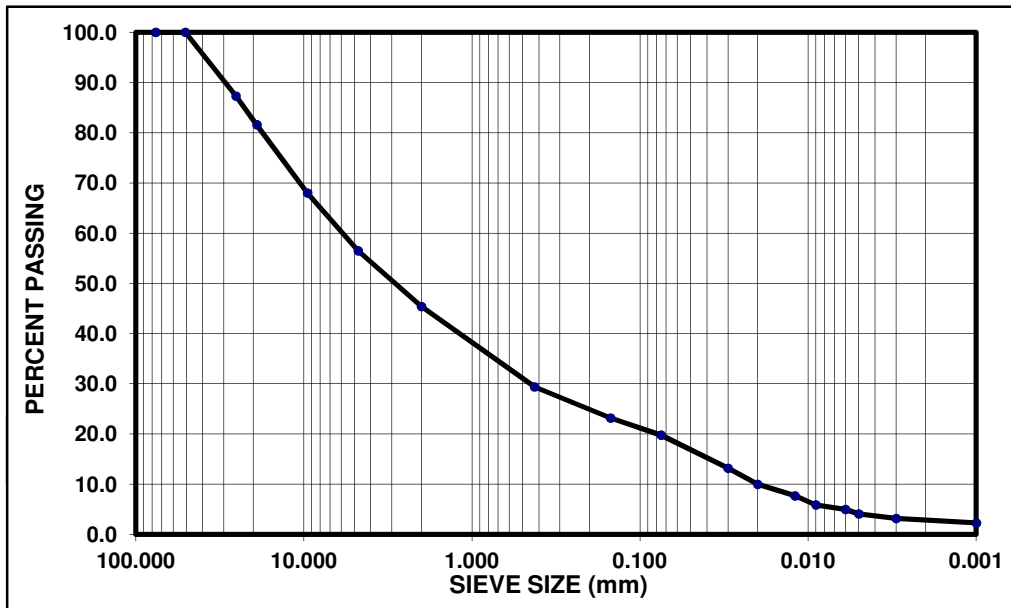
General Notes

1. Test pit terminated at 1.4 m on BEDROCK.
2. Test pit dry upon completion; test pit walls moist.
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 21.



GRADATION ANALYSIS REPORT

Project No:	TF11104105.1000	Date Sampled:	15-Jun-12
Project:	Geotechnical Investigations and Resistivity Testing - Sub-Station Sites	Date Tested:	20-Jun-12
Client:	Nalcor Energy - Lower Churchill Project	Sample Description:	Gravel and Sand, some Silt, trace Clay.
Sampled By:	B. Walsh	Sample Depth:	1.0 m - 1.4 m
Test Pit ID:	TP-04	Sample Type:	Test Pit
Lab ID No.:	4592		



SIEVE SIZE (mm)	PERCENT PASSING	Material	%
76.200	100.0	Gravel	43.5
50.800	100.0		
25.400	87.3		
19.050	81.6		
9.525	68.0		
4.760	56.5	Sand	36.7
2.000	45.4		
0.425	29.4		
0.150	23.2		
0.075	19.8	Silt	17.1
0.0300	13.2		
0.0200	10.0		
0.0120	7.7		
0.0090	5.9		
0.0060	5.0		
0.0050	4.1	Clay	2.7
0.0030	3.2		
0.0010	2.3		

ATTERBERG LIMITS	
Liquid Limit	NA
Plastic Limit	Non Plastic
Plasticity Index	NA

Comments: The as received moisture content of the sample was determined to be 12.6%.

Estimated in the field: % Boulder: 5 - 10 % Cobble: 10 - 15

AMEC Environment & Infrastructure

Per: *Farah Alise*

Reporting of these test results constitutes a testing service only.
Engineering interpretation or evaluation of the test results is provided only on written request.

Construction Materials Laboratory
36 Pippy Place
St. John's, NL Canada A1B 3X2
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Fax. (709) 722-5025



Test Pit: TP-05

Firm:	Nalcor Energy			Date: June 16, 2012
Project:	Geotechnical Site Investigation - Proposed Site, Shoal Cove, NL			
Contract No.:	LC-SB-014	Location:	N 5690249	E 525631
		Inspector: Brad Walsh		

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.6	PEAT – rootlets, organic rich soil, bog, loose, dark brown to black, moist.	-	-	-
0.6 – 1.6	MARINE SEDIMENT – Silty SAND AND GRAVEL, trace to some cobbles, trace boulders, compact, grey moist..	-	-	-
1.6	Test pit terminated at 1.6 m on BEDROCK.			
Estimated Cobbles (%) 10		Estimated Boulders (%) 5		Estimated Max Diameter (m) 0.3

General Notes

1. Test pit terminated at 1.6 m on BEDROCK.
2. Test pit dry upon completion; test pit walls moist.
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 21.



Test Pit: TP-06

Firm:	Nalcor Energy			Date: June 16, 2012
Project:	Geotechnical Site Investigation - Proposed Site, Shoal Cove, NL			
Contract No.:	LC-SB-014	Location:	N 5690159	E 525745
				Inspector: Brad Walsh

PHOTOGRAPHS



Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.2	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.2 – 1.4	FRACTURED BEDROCK – Fractured, angular pieces of bedrock, < 0.9 m maximum diameter, sand, silt and gravel intermix.	-	-	-
1.4	Test pit terminated at 1.6 m in FRACTURED BEDROCK.	-	-	-
Estimated Cobbles (%) -		Estimated Boulders (%) -		Estimated Max Diameter (m) -

General Notes

1. Test pit terminated at 1.6 m in FRACTURED BEDROCK.
2. Test pit dry upon completion.
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 21.



Test Pit: TP-07

Firm:	Nalcor Energy			Date: June 15, 2012
Project:	Geotechnical Site Investigation - Proposed Site, Shoal Cove, NL			
Contract No.:	LC-SB-014	Location:	N 5690133	E 525606
				Inspector: Sheldon Andey

PHOTOGRAPHS

NO PHOTO AVAILABLE	NO PHOTO AVAILABLE
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Soil and Groundwater Conditions

Depth (m) From - To	Description	Sample ID.	Sample Depth (m)	Sample Type
0.0 – 0.3	TOPSOIL/ROOTMAT – rootlets, organics, trace silt and sand, loose, dark brown to black, moist.	-	-	-
0.3 – 1.4	MARINE SEDIMENT – SILTY SAND, some gravel, trace cobbles, compact, grey, moist.	-	-	-
1.4	Test pit terminated at 1.4 m in BEDROCK.	-	-	-
Estimated Cobbles (%) 5 - 10	Estimated Boulders (%) -	Estimated Max Diameter (m) 0.1		

General Notes

1. Test pit terminated at 1.4 m in BEDROCK.
2. Test pit dry upon completion.
3. UTM coordinates obtained using a handheld Lowrance GPS unit referencing NAD83, Zone 21.



APPENDIX C
PHOTOGRAPHIC JOURNAL



APPENDIX C1
SOLDEIRS POND SITE

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
SOLDIERS POND, NEWFOUNDLAND
PHOTOGRAPHIC JOURNAL**



Photo 1: Synchronous condenser trench in early stages of excavation.



Photo 2: Till excavated from trench.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
SOLDIERS POND, NEWFOUNDLAND
PHOTOGRAPHIC JOURNAL**



Photo 3: Large boulder excavated from trench.



Photo 4: Ground conditions at the west end of the trench.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
SOLDIERS POND, NEWFOUNDLAND
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Photo 5: Till excavated from the trench.



Photo 6: Trench upon completion.



APPENDIX C2
CHURCHILL FALLS SITE

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
CHURCHILL FALLS, LABRADOR
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Photo 1: Existing access road running through the site.



Photo 2: Existing access road running through the site.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
CHURCHILL FALLS, LABRADOR
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Photo 3: Typical ground conditions.



Photo 4: Typical ground conditions.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
CHURCHILL FALLS, LABRADOR
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Photo 5: Typical ground conditions.



Photo 6: Typical ground conditions.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
CHURCHILL FALLS, LABRADOR
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Photo 7: Typical ground conditions.



Photo 8: Typical ground conditions.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
CHURCHILL FALLS, LABRADOR
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Photo 9: Typical ground conditions.

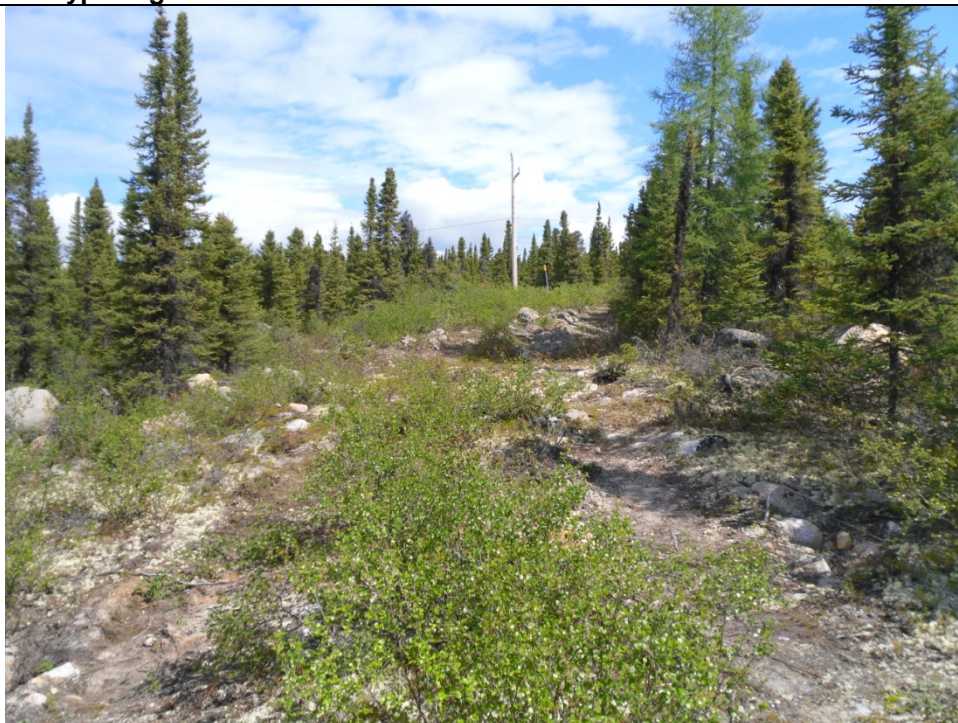


Photo 10: Typical ground conditions.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
CHURCHILL FALLS, LABRADOR
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Photo 11: View of Route 500 from the site.



Photo 12: Typical ground conditions.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
CHURCHILL FALLS, LABRADOR
PHOTOGRAPHIC JOURNAL**



Photo 13: Typical ground conditions.



Photo 14: Typical ground conditions.



APPENDIX C3
FORTEAU POINT SITE

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
FORTEAU POINT, LABRADOR
PHOTOGRAPHIC JOURNAL**



Photo 1: Typical ground conditions at the original proposed site.



Photo 2: View of the revised site.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
FORTEAU POINT, LABRADOR
PHOTOGRAPHIC JOURNAL**



Photo 3: View of the revised site.



Photo 4: Typical ground conditions at the original proposed site.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
FORTEAU POINT, LABRADOR
PHOTOGRAPHIC JOURNAL**



Photo 5: Typical ground conditions at the original proposed site.



Photo 6: Typical ground conditions at the original proposed site.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
FORTEAU POINT, LABRADOR
PHOTOGRAPHIC JOURNAL**



Photo 7: View of the revised site.



Photo 8: View of the revised site.



APPENDIX C4
SHOAL COVE SITE

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
SHOAL COVE, NEWFOUNDLAND
PHOTOGRAPHIC JOURNAL**



Photo 1: Cut - over in the northeast section of the Site.



Photo 2: Cut - over in the northeast section of the Site.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
SHOAL COVE, NEWFOUNDLAND
PHOTOGRAPHIC JOURNAL**



Photo 3: Exposed limestone bedrock.



Photo 4: Site Conditions.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
SHOAL COVE, NEWFOUNDLAND
PHOTOGRAPHIC JOURNAL**



Photo 5: Exposed limestone bedrock.



Photo 6: Typical site conditions.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
SHOAL COVE, NEWFOUNDLAND
PHOTOGRAPHIC JOURNAL**



Photo 7: Typical site conditions.



Photo 8: Typical site conditions.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
SHOAL COVE, NEWFOUNDLAND
PHOTOGRAPHIC JOURNAL**



Photo 9: Typical site conditions.



Photo 10: Typical site conditions.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
SHOAL COVE, NEWFOUNDLAND
PHOTOGRAPHIC JOURNAL**



Photo 11: Typical site conditions.



Photo 12: Typical site conditions.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
SHOAL COVE, NEWFOUNDLAND
PHOTOGRAPHIC JOURNAL**



Photo 13: Typical site conditions.



Photo 14: Typical site conditions.

**GEOTECHNICAL SITE INVESTIGATION AND RESISTIVITY TESTING
PROPOSED STATION SITE
SHOAL COVE, NEWFOUNDLAND
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Photo 15: View of the Site looking north.



Photo 16: View of the Site looking north.



APPENDIX D

AMEC REPORT No. TF1010482

“



L'Anse au Diable North Side

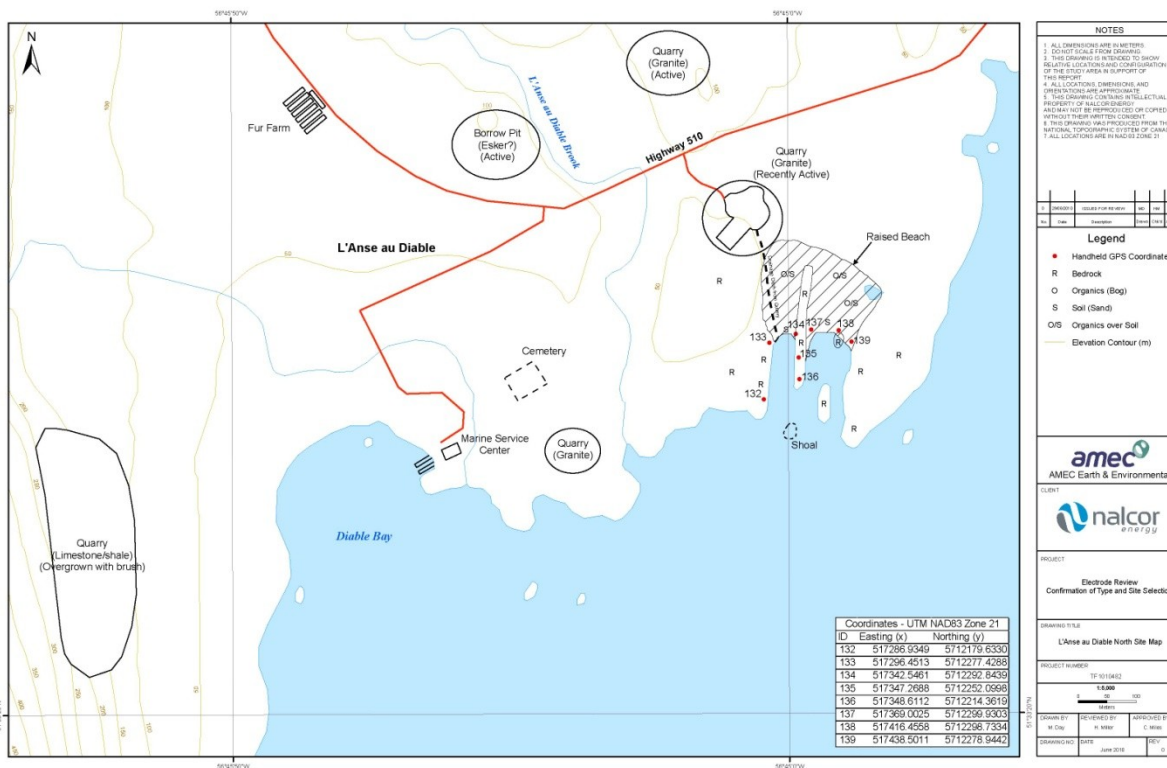
This site is in a south facing cove with somewhat rectangular dimensions of 130 m to 150 m wide and length of approximately 150 m. The majority of the shoreline is exposed granite gneiss bedrock. A pancake shoal that is exposed at low tide exists at the east side of the entrance to the cove. A bedrock ridge that is probably awash at high tide exists near the west of centre of the cove that extends south for about 2/3 of the length of the cove. Sand has accumulated within the inner reaches of the cove and the shoreline north of the cove. Several raised beach strand lines are visible extending about 100 m north of the present day beach. The visibility through the water was excellent during the field visit. The bottom comprises a mix of exposed rock, sand and boulders. Water depth at the southwest, outside end of the cove was visibly estimated to be about 6 m deep adjacent to the cliff.

The area north of the beach area is generally wet with bog land developed containing small ponds. A small intermittent stream flows south to enter the beach area at about the centre of the cove. The water flowing from this stream disappeared into the beach sand.

A quarry is developed in the hillside about 200 m north of the cove. A drainage ditch has been dug from this quarry and leads southward to the beach area. The small volume of water from this ditch disappeared into the beach sand.

The rock in the vicinity of the cove in the lower elevations was close to very close jointed granite gneiss. Rock in the higher elevations was sub-horizontally, thin to massive bedded limestone and shale.

There are four quarries and a borrow pit located within 1 kilometre of the site. Three of the quarries are in granite gneiss rock show signs of recent activity while the third one is in limestone/shale and is overgrown with a thick growth of brush.





View of Cove looking south



View of cove looking east



View of cove looking northeast. The clear water at the mouth of the cove is visually estimated to be 6 m to 10 m deep.



A bedrock shoal is located just outside the mouth of the cove.



The substrate at the inner east end of the cove comprises a mix of sand and boulders.



Water about 6m deep exists on the west shoreline at the mouth of the cove.



Typical bare granite gneiss rock surrounds the outer reaches of the cove.



View looking south with small stream in foreground, a small quarry and cemetery at mid photo, and the Marine service Centre and L'anse au Diable main Cove in the background. There is a larger quarry located on the hillside in the background.



View of the upland area west of the cove showing the fur farm on the left of the photo and the borrow pit near left of centre and the granite gneiss quarry in the background. The community of Capstan Island is in the background. The highway is Route 510.



View looking west towards a quarry and Route 510 in the left background.



Active granite gneiss quarry located 300 m northwest of the cove.



APPENDIX F
LIMITATIONS



AMEC Environment & Infrastructure
LIMITATIONS OF REPORT

The interpretations given in this report are based on information determined at the test locations. The information contained herein in no way reflects on the overall viability of the project. Subsurface conditions between and beyond the test locations may differ from those encountered at the test locations, and conditions may become apparent during development, which could not be detected or anticipated at the time of the site investigation.

Except as otherwise maybe specified, AMEC disclaims any obligation to update this report for events taking place, or with respect to information that becomes available to AMEC after the time during which AMEC conducted the assessment.

The interpretations given in this report are applicable only to the project described in the text, and the comments made in this report relating to potential of the site(s) are intended only for guidance. The number of samples may not be sufficient to determine all the factors that may affect the viability of the project. This work has been undertaken in accordance with normally accepted geoscientific practices. No other warranty is expressed or implied.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. AMEC Americas Limited accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

.....



Lower Churchill Project

Contract-Specific Environmental Protection Plan Template

SLI Document No. 505573-0000-68RA-I-0011-01

Nalcor Reference No. LCP-SN-CD-0000-EV-PL-0006-01-B2

Date: 27-Sep-2012

Prepared by:

A handwritten signature in blue ink, appearing to read "Lesley Reid", written over a horizontal line.

Lesley Reid

Environmental Coordinator Transmission Lines and
DC Specialties

Verified by:


A handwritten signature in blue ink, appearing to read "David Haley", written over a horizontal line.

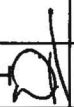
David Haley
Environmental Manager

Approved by:

A handwritten signature in blue ink, appearing to read "Normand Bechar", written over a horizontal line.

Normand Bechar
Project Manager

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Revision					
N°	By	Appr.	Date	Revised pages	Remarks
01	LR	DH 	27-Sep-12	ALL	Issued for Final
00	LR	KD	01-Nov-11	ALL	Issued for Final


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1 SCOPE


This Contract Specific Environmental Protection Plan (C-SEPP) template shall be used to complete a C-SEPP by the Contractor and shall describe the Contractor's procedures and methods to be implemented during site activities to minimize pollution, protect and conserve natural resources, restore damage, and control noise and dust within reasonable limits. The C-SEPP must be accepted by both SLI and Nalcor, as part of the Work Plan, prior to the start of any on-site activities or mobilization to the site.

A Project Wide Environmental Protection Plan (P-WEPP) has been prepared and is part of the Contract Documents. The P-WEPP will serve as a resource to Contractors as they prepare their own C-SEPP. Select contract packages will include this C-SEPP template/outline and specific instructions on how the C-SEPP is to be properly completed. Contractors are responsible for developing, implementing, and maintaining their own C-SEPP.

The C-SEPP shall include the following information:

- a) Description of construction sequence and work methods.
- b) Roles and responsibilities.
- c) Mitigation procedures for all areas of environmental concerns.
- d) Procedures for environmental monitoring.
- e) Maintenance requirements for environmental control structures.
- f) Procedures for post-activity clean-up and demolition.
- g) Contingency planning for environmental concerns.

The C-SEPP shall also include any permits, registrations or notifications required by Federal, Provincial or aboriginal stakeholders for the proposed activities. The Contractor may be required to prepare additional environmental documentation prior to any fieldwork for non-time critical removals. The Contracting Officer will determine the type of environmental documentation required at each site.

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2 C-SEPP OUTLINE/PROPOSED TABLE OF CONTENTS

2.1 Contractor's Name

Provide name of company

2.2 Brief Description/Scope of Work of Contract

Include scope of work, methods of construction, etc.

2.3 Schedule of Work

Include a detailed schedule of work including sequence of activities (GANTT type chart).

2.4 Responsibilities


List all responsible personnel (i.e. Project Manager, Environmental Coordinator, Health and Safety Manager, Field Supervisor, Regulators, etc.) including work specific roles and responsibilities including accountabilities and qualifications and interface roles and responsibilities between Contractor and Subcontractors. A table similar to that shown below would be acceptable.

Name	Title/Responsibility	Contact Information

2.5 Emergency Contacts

List emergency contacts required for the protection of environmental and human health. A table similar to that shown below would be acceptable.

Name	Governing Agency	Title/Responsibility	Contact Information

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2.6 Description of Resources

Identify resources required (personnel, facilities, equipment, consumables or other requirements) required to complete contract.

2.7 Installations Required

List any temporary or permanent installations such as bridges, culverts, cofferdams, settling ponds, etc.


2.8 Applicable Policies and Training

List any environmental policies, compliance procedures and rules for contractors and subcontractors to follow. Also list any environmental training, including site specific training available to employees, or managers, as well as subcontractors. Attach any applicable documentation regarding policies or training.

2.9 Site Specific Environmental Concerns:

List any potential environmental concerns and sensitive issues associated with specific construction activities. The items listed below must be identified and located, on a site plan or sketch that shall be submitted with the C-SEPP. In the case of linear developments, this shall be located on a plan and profile by kilometer markings (or structures in the case of transmission lines). The plan shall identify the following:

- a) Endangered/threatened species or identified critical habitat within the project site.
- b) Wetlands within the project site.
- c) Cultural and archaeological resources within the project site.
- d) Water resources (all water bodies or watercourses such as ponds, lakes, streams) within the project site.
- e) Coastal zones within the project site.
- f) Trees and shrubs that will be removed within the project site.
- g) Existing waste disposal sites within the project site.
- h) Timing restrictions regarding construction of various construction sites.

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2.10 Plans


The following full plans are to be prepared:

- a) Sedimentation and Erosion Control Plan
- b) Rehabilitation Plan
- c) Compliance Monitoring Plan
- d) Dewatering Plan
- e) Blasting Plan


2.11 General Environmental Protection Procedures

A complete list of activities requiring mitigation measures, as outlined in the P-WEPP is provided below (1 – 35). List or reference specific procedures and methods for environmental protection and mitigation as they apply to the specific contract. Note: all activities will not apply to all contracts.

- 1) Scheduling and timing of Construction Activities
- 2) Construction Entrance
- 3) Linear Developments
- 4) Winter Construction
- 5) Equipment Operations and Movement
- 6) Vessel Operations (Barge/Boats)
- 7) Helicopter Traffic
- 8) Clearing of Vegetation
- 9) Pumps and Generators
- 10) Surveying
- 11) Drilling
- 12) Surface Water and Groundwater Use
- 13) Storage, Handling and Disposal of Fuel and other Hazardous Materials

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- 14) Sewage Disposal
- 15) Solid Waste Disposal
- 16) Working within 15 meters of a Body of Water
- 17) Watercourse Crossings – Fording, Culverts and Bridges
- 18) Buffer Zones
- 19) Alterations to a Body of Water/Instream Works
- 20) Working In/Around Marine Environmental
- 21) Grubbing and Disposal of Related Debris
- 22) Quarrying and Aggregate Removal from Borrow Areas
- 23) Trenching
- 24) Excavation, Backfilling and Grading
- 25) Erosion Prevention and Sediment Control
- 26) Site Water Management
- 27) Dewater Work Areas
- 28) Blasting and Waste Rock Disposal
- 29) Concrete Production
- 30) Dust Control
- 31) Noise Control
- 32) Resource Specific Mitigations
- 33) Commissioning
- 34) Reservoir Impoundment
- 35) Site Rehabilitation

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The activities listed above coincide with Section 5.0 of the P-WEPP, and if applicable to the specific contract, they should be reviewed and included in the C-SEPP. The Contractor should confirm that they agree with the specific measure noted in P-WEPP Section 5 or propose an alternative for consideration.

2.12 Monitoring/Auditing


Describe any monitoring activities required. Monitoring may include surveillance monitoring, compliance monitoring, wildlife monitoring, etc. The following details should be included:

- a) Analytical parameters and laboratory to be used for samples.
- b) Sampling locations.
- c) Frequency of sampling.
- d) Reporting (frequency of reports and what to include).
- e) Corrective Actions (how to identify, document and execute).

2.13 Environmental Contingency Measures

List specific environmental contingency measures to be implemented should the environmental protection procedures be unsuccessful in protecting the environment. Contingency measures should be included for the following:

- a) Fuel and hazardous materials spills (including details on spill response equipment).
- b) Forest fires (including details on spill response equipment).
- c) Wildlife encounters and nuisance presence.
- d) Discovery of historic resources.
- a) Alternative protection procedures for erosion and sediment control and site water management (measures to be implemented in the event initial mitigations are not successful).

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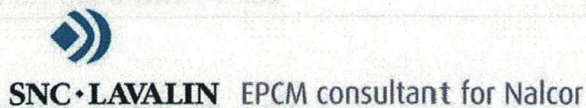
2.14 Permits, Registrations, Notifications, Approvals and Authorizations

List all permits, registrations, notifications, approvals and authorizations that are required. A table similar to that shown below would be acceptable.

Required Registrations/Approvals/Permits/Authorizations/Notifications	Issuing Department	Individual Obtaining Permit

2.15 Document Control

Provide details on document control methods.



Date	Department Manager	Department

HEALTH AND SAFETY MANAGEMENT PLAN

Nalcor Doc. No. LCP-PT-MD-0000-HS-PL-0001-01

<p>Comments: This document supercedes LCP-SN-CD-0000-HS-PL-0001-01</p>	<p>Total # of Pages: (Including Cover): 138</p>
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B3	19-Jun-2013	Issued for Use				
B2	05-Oct-2012	Issued for Use				
B1	07-May-2012	Issued for Use				
Status / Revision	Date	Reason for Issue	Prepared by	Functional Manager Approval	Quality Assurance Approval	Project Manager (Generation + Island Link) Approval

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Inter-Departmental / Discipline Approval (where required)

Department	Department Manager Approval	Date
	Name	
	Name	
	Name	
	Name	

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Executive Summary

Nalcor Energy is committed to develop the Lower Churchill Project (LCP or the Project) with complete dedication to minimizing the risks of injury or ill health to personnel and damage to property or the environment as low as reasonably practicable. Nalcor Energy believes that safety and health performance is fundamental to the achievement of project success, as well as its overall business and project objectives. It is therefore the Project Delivery Team's expectation and requirement that all personnel associated with the Project will play an integral role in the implementation of its occupational safety and health strategy, performing at the highest possible levels and fostering continuous improvement in the areas of safety and health.

This Safety and Health Plan provides guidance on how the Lower Churchill Project work scope can be safely executed. This Plan is focused for all levels of LCP management and specifically identifies the strategies and practices that project personnel will employ to ensure that health and safety performance excellence is achieved. Individual responsibility and total commitment to a strong safety culture are well defined and established elements for achieving Incident and Injury-Free performance on the Project are in place.

Nalcor believes sound health and safety performance is fundamental to successful business performance. It is therefore the requirement and expectation of the Project Delivery Team that all personnel associated with the Project shall play an integral part in the full implementation of the health and safety management strategy, performing at the highest possible levels and fostering a focus on continuous improvement in health and safety. Eliminating all work related injuries, while effectively managing and executing the project, is what ultimately defines us, as well as the overall success of the project.

Nalcor believes that achieving its safety commitment of "Zero Harm- Nobody Gets Hurt" requires a proactive health and safety management system is in place at the work-face level for all contractors and suppliers. The Health and Safety Management vision of the Lower Churchill Project is the ***"Relentless pursuit of an injury and illness free workplace where nobody gets hurt."*** Project excellence is not achievable without performance excellence in safety.

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Key Focus Areas:

Nalcor recognizes that the following focus areas of the health and safety program are the key to the success of its Health and Safety effort. All Health and Safety Plans associated with the Project should include the following key focus areas and the intent of the initiatives:

- **Management Commitment:** Management must convince the workplace that safety is a core value by actively and visibly participating in the health and safety effort and by providing adequate resources.
- **Workplace Participation:** All personnel must actively participate in the health and safety effort to promote understanding, ownership and commitment.
- **Effective Communication:** Open and honest communication across all levels of personnel, supervision and management must be achieved. The safety process must reinforce and foster mutual feedback and respect.
- **Positive Reinforcement:** Positive reinforcement and constructive feedback must be promoted to ensure that desired worksite behaviors occur frequently.
- **Performance Measurement:** Leading indicators must be captured, analyzed and communicated to indicate how the workplace is proactively committed to the achievement of an injury/incident free working environment.
- **Caring about the Worker:** Focus must be placed on the worker as an individual. A work environment, which is safe and maintains a high level of employee morale and positive attitude must be created and maintained.
- **Empowerment:** Personnel must be empowered to immediately stop any unsafe behaviors or conditions that they find during the course of their work. Personnel must correct these unsafe behaviors or conditions as soon as practicable.
- **Accountability:** All personnel must understand that each individual is responsible for his or her own safety. First line supervision must understand that they are accountable for the safety of their direct reports and that they must undertake the coaching role.
- **Competency:** All personnel must be fully competent to perform their daily work activities in a safe and productive manner.
- **Pro-activity:** A pro-active approach to the health and safety effort must be emphasized and practiced. This will allow unsafe workplace behaviors and conditions to be addressed before they turn into incidents.
- **Risk Management:** A process to identify and mitigate hazards must be implemented. When hazards are identified, steps must be taken to eliminate or reduce exposure by designing in safety, changing work procedures, requiring additional PPE or raising safety awareness.

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- Systemic Approach: Ensure that all systems are designed to include a clear description of scope and objectives; processes and procedures used in the work activity, identify workers and management responsible for the execution of the processes and procedures, a measurement and verification process and a feedback system that analyses measurement and verification information for continuous improvement.
- Partnership: Learn from others to evaluate and implement the best possible health and safety practices used for implementation.

Key Strategies for Achieving the Project’s Safety Management Vision

1. *Ensuring clear accountability for safety performance with line management. This may be accomplished through:*

- Clearly defined roles and responsibilities within the job description of each member of line management;
- The establishment of Safety performance targets for each member of line management;
- Periodic performance reviews (at least annually) shall be carried out to assess overall safety performance and accountability of line management; and
- Line management health and safety performance initiatives, creativity and timely achievement of established targets will be recognized/rewarded, as appropriate. Poor overall performance will be noted and discussed with individual with an action plan to enhance overall performance.

2. *Implementing a formal leadership training program for all levels of management and supervision. This strategy will be accomplished by ensuring that:*

- All project management and supervisory personnel attend and actively participate in the SLI safety leadership training program as soon as practicable.
- Project management and supervisors are encouraged to attend follow-up training sessions as and when provided.
- All Leadership Training Program attendees are encouraged to implement lessons learned from the training into the work environment, as well as engaging others in working discussions with Health and Safety as the issue.
- Leadership is encouraged to interact with other leaders/managers to discuss lessons learned and implementation strategies.

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3. *Demonstrating tangible commitment and involvement by Senior Management towards the “relentless pursuit” of safety performance excellence is essential. This will be realized by:*

- Providing the appropriate level of resources, equipment and personnel to execute each work task safely.
- Actively participate in FELT Leadership, which includes strong, visible management commitment; recognizing management’s role of being a teacher, trainer and coach; always maintaining effective communications; and undertaking timely and meaningful auditing and re-evaluation processes.
- Establishing and maintaining Health and Safety as our core value through continually safeguarding the well-being of project personnel, the general public, and the environment through safe and environmentally responsible work practices associated with the design, construction, transportation and commissioning. Health and Safety must not be prioritized along with other business priorities.
- Continually striving to maintain an accident and incident free working environment at all project and contractor work sites, and ensuring total compliance with all Health and Safety applicable regulations.
- Always challenge and correct wherever possible any Unsafe Acts, Conditions or Procedures in a timely manner;
- Be actively involved in the SWOP process.

4. *Selecting competent contractors for executing the work, while coaching and guiding them in the delivery of the Project in order to achieve our Vision. This is best accomplished by the following:*

- The Project Delivery Team, through line management will ensure that contractor Health and Safety performance is monitored and unsatisfactory Health and Safety performance and mitigating action are addressed in contract terms and conditions and duly executed as and when appropriate.
- The Project Delivery Team will ensure an effective and workable procedure is in place to evaluate and select third party services by: Ensuring that prior to commitment the risks are appropriately reviewed, mitigating measures identified/addressed;
- The Project Delivery Team will define third party performance expectations, communicate and monitor contractor performance requirements that:

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- Establish and execute contracts and agreements that clearly incorporate Health and Safety requirements;
- Become actively involved in monitoring, mentoring and coaching Contractors, Ensure Contractors’ roles and responsibilities are clearly defined;
- Establish Health and Safety performance targets, metrics and measures; Ensure Health and Safety performance with contractors are regularly reviewed and communicated and Integrate appropriate actions/performance enhancement plans to improve overall contractor performance.
- The Project Delivery Team and Line Management will periodically coordinate and/or conduct internal and external Health and Safety audits on contractors and third party performance.

5. *Involve all workers in safety management. This will be initiated by the following:*

- Ensuring that all employees and contractor understand that they have a stake in the overall success of the project --- Health and Safety is everyone's responsibility.
- Actively encourage employee involvement by holding them accountable and ensuring everyone does their part through periodic monitoring, inspections, assessment and audits.
- Encouraging participation into the Joint Occupational Health and Safety Committee (JOHS).
- Incorporating daily safety inspections as part of the employee/contractor job task.
- Ensuring employees and contractors are informed about safety inspections, injury and illness statistics, and other safety-related issues.
- Management and line supervisors should assign meaningful tasks to employees and contractors that support safety.
- Management and line supervisors should place value in employee/contractors input and feedback with regard to improving the safety and health program, as they often know more about safety problems and solutions than managers do.
- Holding employees accountable by:
 - Including safety and health responsibilities in job descriptions; including compliance with safe work practices a part of performance evaluation;
 - Setting and measuring achievements toward meeting safety targets;
 - Ensuring employees/contractors with reckless or unsafe behaviours are appropriately disciplined and recognizing employees and contractors who contribute to keeping the workplace safe.

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6. Utilizing safe work practices/behaviors to avoid accidents. This is best accomplished utilizing the following practices:

- Site Health and Safety Orientations must be carried out prior to work commencement at the construction site. The Health and Safety orientation is the most important communication tool that management has to clearly convey the safety expectations and responsibilities of the job task and working environment. To ensure everyone knows how hazards will be effectively identified, communicated and controlled.
- Ensure safe work practices are clearly defined, documented and communicated to employees and contractors.
- Utilize SWOP (Safe Workplace Observation Program) as a means of not only recognizing unsafe work practices and behaviours, but recognizing the application of safe work practices and behaviours. Please refer to Appendix "C", page 76 for additional information about the SWOP.
- Incorporate and communicate Lessons Learned from incidents and near misses. Encourage reporting and investigating near-miss incidents and glean lessons learned and communicating them to other potentially affected personnel.
- Target safe work practices and procedures with the primary goal of eliminating incidents and injuries in the workplace.
- Employ frequent opportunities for reminders of established safe work practices and behaviors to employees and contractors.
- Solicit feedback and input from employees and contractors regarding enhancement of safe work practices/behaviours for tasks they are frequently involved with executing. Ensure that this feedback is heard, evaluated, addressed and timely feedback is provided in all cases.
- Review safe work practices periodically (at least annually) to ensure they are effective, meet regulatory requirements.

7. Risk management and control practices can best be incorporated in daily work activities utilizing the following practices:

- A TBRA (task-based risk assessment) is a risk management tool that should be used to evaluate risk prior to a new or complex work activity. The TBRA identifies personnel interaction with the work activity, the tasks to be performed, and the hazards associated with those tasks. The TBRA identifies known and potential hazards and emphasizes risk reduction.

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- Step Back 5X5 is a process that encourages workers to identify hazards associated with all tasks before starting a job. It helps to promote a hazard management culture through continual self-evaluation. It is based on the principle of “engaging the mind before engaging hands” by: Stepping back 5 paces from the job; Investing 5 minutes (nominal) to step through the job mentally and identify plans to control hazards before starting the job. It is an informal personal planning process and essentially a mental JHA applied before starting all jobs.
 - Systematically listen to those personnel that understand the risks of a particular task not only when a crisis occurs, but as the right way to manage activities on the project.
 - Develop safe working rules, practices and procedures based on risk experience, safety knowledge and competent work direction.
 - Assess all anticipated known risks prior to starting a new activity or one that is conducted very rarely.
 - Ensure employees and contractors are effectively trained in risk management practices and procedures, as well as actual application of risk management in actual practice. This includes processes, methods and tools available.
 - Stimulate and maintain the desire and commitment of line management, contractors and employees to perform risk management practices in daily work activities.
8. *Establishing strong functional expertise in health and safety management who are fully engaged in both strategic direction-setting and day-to-day project delivery activities. This can be accomplished by the following:*
- Selecting trained, capable, educated and experienced health and safety personnel to provide appropriate guidance and direction for the overall health and safety management effort strategically and on a daily basis.
 - Providing strong functional and technical expertise to support the execution and implementation of health and safety practices, policies, and processes relative to contractor and employee safety.
 - Focusing function and technical support on effective contractor Health and Safety management throughout the course of the project.
 - Preparing and reviewing project safety and security management plans.
 - Supporting the project level execution of contractor qualification and performance assessment processes.
 - Supporting and contributing to the health and safety performance reporting processes.
 - Supporting and facilitating construction, contractor and employee Health and Safety training.

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- Monitoring regulatory developments, evolving issues and industry best practices, and proactively facilitates the continuous improvement of the Major Projects health and safety management system.
- Providing coaching and mentoring to applicable Project Management to enhance Major Project’s Health and Safety objectives.

9. *Focus on measuring leading indicators (e.g., field observations, interventions and worksite inspections. This can be achieved through due consideration of the following:*

- Project Management actively supports the concept of utilizing leading indicators as a measure for proactively controlling loss/damage.
- A ‘balanced scorecard’ providing information on a range of Health and Safety activities will be utilized for the project rather than a single performance measure.
- Measurement of leading indicators provides information on how the Health and Safety Management System operates in practice, and identifies areas where remedial action is required and provides a basis for continuous improvement and provides a mechanism for feedback and consequential motivation.
- Employees and Contractors must clearly understand exactly what proactive/leading indicators are being measured and what significance the use of the measurement will have on producing the desired performance result.
- Leading indicators are to be utilized as a means of publicizing data with the project workforce which focuses attention on a particular program area and is by doing so will lead to safety improvements in a short period.
- Key Project activities in the Health and Safety Management System that need to be promoted, reinforced and visibly drive the culture will be selected and measured, wherever possible.

10. *Development of an incident management and emergency response management plan/program that reflects the uniqueness/specifics of the work and associated work locations. This can be achieved with consideration of the following:*

- Identifying all reasonable/probable risk events/scenarios specific to the Lower Churchill Project that may require incident management and/or emergency response. Examples for the LCP will include (but not limited to): fire, explosion, flooding, civil unrest, equipment failure, vehicle/transportation incidents (including helicopter incidents), extreme weather, missing or lost personnel.

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- Ensuring adequate resources are available at the site location or, where possible, mutual aid agreements are established which would allow appropriate resources to be moved to the site in the event they are required.
- Identifying Key Incident/Emergency Response Personnel, Communications Links, Roles and Responsibilities, Emergency Support Services, Logistics coordination, Alert/Emergency Criteria. Current contact numbers must be continuously updated/maintained.
- Ensuring key communications links are established, communicated, maintained and tested via drills on a frequent basis.
- Developing procedures which provide clear instructions to Emergency Response Team with a focus of minimizing and/or containing damage and risk to others.
- Ensuring external agencies such as the RCMP, RNC are contacted as and when appropriate and stipulated in the incident/emergency management procedures.
- Business Recovery measures are identified and implemented after the incident/emergency is stabilized and under control.
- Fully investigate all emergency response incidents (and other incidents as appropriate) to identify lessons learned and communicate these to affected personnel.

1.0 Purpose

The purpose of this document is to outline the overall Health and Safety Management Plan for the management of Occupational Health and Safety on the Project. This LCP Health and Safety Management Plan defines the LCP expectations for health and safety planning and performance and describes how the Project will establish the Health and Safety Management System and implement the associated initiatives. It serves to provide the guidance, framework, and details of how the Safety Credo will be embedded with the LCP.

This Health and Safety Management Plan has been developed in full alignment with the Safety and Health Management System and all applicable Nalcor Energy Resources safety and health policies. The Safety and Health Management System and applicable processes and procedures will be utilized throughout the Project. In the event that any contract/subcontract company or functional group has control mechanisms, safety work practices than are identified in the plan, the more rigorous of the two will be implemented.

This Health and Safety Management Plan will help ensure that work conducted at all stages of the LCP complies with the intentions of the overall Health and Safety Management System, Health and Safety Policy and the Safety Credo.

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The Project Delivery Team must fully understand and effectively apply the LCP Health and Safety Management Plan, as well as supporting documents, policies, programs and procedures, to all phases of design, construction, commissioning and full power. The ultimate objective to ensure that all risks are minimized to as low and reasonably practicable (ALARP) and a relentless pursuit of an incident free working environment is maintained at all times.

The LCP Health and Safety Management Plan must be utilized effectively by all Lower Churchill Project Delivery Team Members. Contractors and subcontractors must have Health and Safety Plans that align with this plan. For the Strait of Belle Isle Crossing (SOBI), the Contractor executing the work will bridge to this Health and Safety Plan via coordination mechanisms.

2.0 Scope

The Project Delivery Team provides the overall project management for the planning and execution of the LCP, will fully utilize this Health and Safety Management Plan. It is intended that this Health and Safety Management Plan be applied to all parties associated with the LCP, including Nalcor Energy LCP Employees, Contractors, Suppliers, and Consultants. It is a key functional component of the overall LCP Project Management System. Nalcor Energy LCP will require each of its contractors to have an effective and functional health, safety and environment management system in place which is reviewed during the contract bidding evaluation phases of all planned and executed contract activity. Consistency of the contractor Health and Safety Management System with the Nalcor Energy LCP Health and Safety Plan shall be addressed through a bridging document. Periodic due diligence audits will be conducted by Nalcor Energy LCP Health and Safety personnel to ensure all objectives, programs and practices monitored are maintained and achieved.

The LCP Health and Safety Management Plan is applicable for all phases of the Lower Churchill Project, including Planning, Design (Preliminary and Detailed), Procurement, Construction, Over-site, Completion and Ready for Operations. This includes the following Sub-Projects of the LCP, Phase I:

- Muskrat Falls Generation
- Labrador-Island Transmission Link
- Labrador Transmission Assets

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This Health and Safety Management Plan is intended to incorporate all applicable Nalcor Health and Safety Practices, Policies, Procedures and Programs as well as achieve compliance with applicable legislation and regulations, which includes the Newfoundland-Labrador OHS Act and Applicable Regulations. Variations in the standards must be communicated to all LCP Personnel, which includes all Contractors and Sub-contractors.. As such, this Plan will function as an overarching document and focal point standard by which the SLI Health and Safety documents and subcontractor documents must bridge and adhere to.

3.0 Definitions

Hazard

The potential to cause harm, including ill health and injury, damage to property plant, products or the environment, production losses or increased liabilities.

Integrated Management System (IMS)

A framework of “coordinated” and “controlled” functional management resources, processes, procedures and tools that organize and direct the LCP with regards to established “project success criteria”, as defined in the LCP Project Charter.

Project Delivery Team

The Project Delivery Team includes managers who functionally report up to the LCP Project Director.

Management System (functional)

This system identifies management resources, processes, procedures and tools necessary to facilitate the achievement of the accountabilities/responsibilities of a functional group. The LCP functional groups correspond to the various functional responsibilities such as Health and Safety, Environmental, Quality, Engineering, Commercial Services, Project Services, etc., as identified in the Project Charter.

4.0 Abbreviations and Acronyms

A/I	Accident/Incident
ALARP	As Low as Reasonable Practicable
ATV	All-Terrain Vehicle
CoF	Certificate of Fitness
CSA	Canadian Standards Association
DnV	Det Norske Veritas

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FMEA	Failure Modes and Effects Analysis
FTA	Fault Tree Analysis
H&S	Health and Safety
HAZID	Hazard Identification Review
HAZOP	Hazard Operability Review
HSE	Health, Safety and Environment
ER	Emergency Response
ISO	International Organization for Standardization
PDT	Project Delivery Team
JOHS	Joint Occupational Health and Safety
LCP	Lower Churchill Project
LITL	Labrador Island Transmission Link
LMS	Learning Management System
LTA	Labrador Transmission Assets
MF	Muskrat Falls
MOC	Management of Change
MSDS	Material Safety Data Sheet
NE	Nalcor Energy
OHSAS	Occupational Health and Safety Assessment Standard
PMT	Project Management Team
PPE	Personal Protective Equipment
PTW	Permit to Work
QRA	Quantitative Risk Assessment
RCMP	Royal Canadian Mounted Police
RFO	Ready for Operations
RNC	Royal Newfoundland Constabulary
SCAT	System Causation Analysis Technique
SLI	SNC Lavalin, Inc
SOBI	Strait of Belle Isle
SWOP	Safe Workplace Observation Program
TDG	Transportation of Dangerous Goods
TBRA	Task Based Risk Assessment
TLV	Threshold Limit Value
TSA	Task Safety Analysis
WHMIS	Workplace Hazardous Material Information Sheet

5.0 Managing Health and Safety on the Lower Churchill Project

Nalcor bears ultimate responsibility for Health and Safety Management and performance within the Lower Churchill Project. In terms of practical implementation of Health and Safety arrangements described in this Plan, the LCP Vice President expects his Management Team to take the lead in ensuring that all applicable arrangements are implemented within their areas of authority.

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Nalcor Energy's Safety and Health Internal Responsibility System (IRS) is the cornerstone on which the Safety and Health Program is based. It is also a set of legal obligations for managing occupational health and safety. The defining principle of the IRS is that everybody within the organization from members of the Board of Directors to a temporary front line employee has a role and responsibility for safety and health. A second, and equally important, principle is that solutions to safety and health issues in the workplace come from employees themselves i.e. internal to the organization. While it is recognized that external assistance may sometimes be required, e.g. OH&S Branch of Government, it should be the exception rather than the rule.

An IRS works when:

- There is an unbroken chain of responsibility for safety and health flowing down through the organization and accountability for fulfilling safety and health obligations flows upward through the organization;
- Each employee takes the initiative on safety and health issues and works to solve problems and make improvements on an ongoing basis; and
- Depending on their position within the organization, their qualifications and authority, each employee accepts responsibility and accountability for their defined role.

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Figure 1.0: Nalcor’s IRS

Nalcor’s Internal Responsibility System



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The Health and Safety function exists to provide the necessary support, advice and guidance to assist personnel discharge their health and safety obligations. The Health and Safety function also audits the Lower Churchill Project systems and activities to provide assurance that our Health and Safety implementation is compliant with applicable legislation or other relevant standards and improvement opportunities are identified and acted upon.

This Plan is built on the following Nalcor Energy commitments:

- The Nalcor Energy “Safety Credo” (Section 7)
- The Nalcor Energy “Guiding Principles” (Section 7)
- The Nalcor Energy “Core Elements” (Section 7)

The following chart represents the overall hierarchy for Lower Churchill Project Health and Safety Management Documents, Plans, Policies and Procedures.

5.1 Health and Safety Management Interface

For MF, LTA and LITL, LCP Site Personnel will interface via daily, weekly and monthly meetings and stewardship sessions with the Project Delivery Team to ensure that:

- Safety and health goals and objectives and scope are fully understood and discussed by all management positions responsible for safety and health.
- The Project Delivery Team and all LCP personnel must clearly understand their roles and responsibilities for all project activities.
- All Management personnel on the project must clearly understand the processes and procedures linked to their areas of responsibilities.
- Joint construction and facility inspections must be conducted in an atmosphere of mutual cooperation to promote visible participation and endorsement of safety and health plan objectives whenever possible.
- The interface process must be reviewed on a periodic basis; continuous improvement plans are formatted and implemented as and when required.

For the Strait of Belle Isle (SOBI) Marine Crossing, the Contractor(s) executing the work will interface via daily, weekly and monthly meetings and stewardship sessions as warranted with the Project Delivery Team. The objectives of these interface sessions are as follows:

- Safety and health goals and objectives, as well as work scope are fully understood and discussed by all management positions for safety and health.

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- The Contractor(s) management personnel must clearly understand their roles and responsibilities for all project activities, as well as the processes/procedures linked to their areas of responsibilities.
- Site inspections must be conducted periodically in an atmosphere of mutual cooperation to promote visible participation and an endorsement of safety and health plan objectives whenever possible.
- Plans for continuous improvement must be developed, implemented and progress tracked periodically.

Upon completion of principal Construction, The critical phases of commissioning and RFO (Ready for Operations) will require that additional Health and Safety Roles and Responsibilities must be carried out to ensure safe transition from Construction to Operations. These include, but are not limited to, the following:

- Health and Safety Management Plan for RFO developed and communicated in advance of RFO Activities.
- Risk Assessments/Task Analysis are executed during commissioning phases.
- Emergency Response Planning and Drills (Training and Establishing Roles and Responsibilities with Operations during Transition Period)
- Develop Health and Safety Procedure for Handover to Operations Personnel with roles and responsibilities clearly defined.
- Ensure appropriate Health and Safety Resources are in place to provide adequate oversight.
- Communications procedures must be developed, clearly defined and communicated to all affected parties.
- Ownership of process procedures must be clearly defined in a procedure
- Post Testing Debriefs must be carried out, fully documented and maintained on file.
- Health and Safety Equipment for RFO must be clearly defined, purchased and available on site in adequate timeframe to ensure coverage is 100% at minimum.

The following chart depicts how Health and Safety will interface with the Lower Churchill Project during three distinctive project phases engineering/ design/procurement; early works phase construction; and construction phase. Health and Safety Management Plans for the Lower Churchill Falls Operation will be developed, communicated and implemented prior to project handover/operations.

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Health and Safety Focus Areas during Principle Construction Phases		
Engineering/ Design/ Procurement	Early Works Phase Construction	Construction Phase
<ul style="list-style-type: none"> Health and Safety Planning Documents (Safety, Medical, Security, ERP) 	<ul style="list-style-type: none"> Early Works- Health and Safety Plan – Site Plans 	<ul style="list-style-type: none"> Construction Phase - Health and Safety Plan – Site Plan
<ul style="list-style-type: none"> Constructability Reviews (per Component) 	<ul style="list-style-type: none"> Risk Assessments 	<ul style="list-style-type: none"> Logistics/Transportation Oversight
<ul style="list-style-type: none"> Contract Evaluations/Input/ Procurement 	<ul style="list-style-type: none"> Task Safety Analysis (TSA's) 	<ul style="list-style-type: none"> Task Safety Analysis (TSA'S)
<ul style="list-style-type: none"> Design Reviews 	<ul style="list-style-type: none"> Emergency Response Planning/Training/Drills 	<ul style="list-style-type: none"> Emergency Response Planning/Training/Drills.
<ul style="list-style-type: none"> Risk Assessment Reviews- Confirm all Health and Safety Hazards/Risks are identified and mitigations are to be in place. 	<ul style="list-style-type: none"> Oversight Audits and Inspections (worksites, security, medical, regulatory compliance) 	<ul style="list-style-type: none"> Oversight Audits and Inspections
<ul style="list-style-type: none"> Contract Work Scope Development 	<ul style="list-style-type: none"> Health and Safety Training (Energy Isolation –Lock-out/Tag-Out; Confined Space; Step Back) 	<ul style="list-style-type: none"> Critical Lifts- Planning, Analysis, Execution
<ul style="list-style-type: none"> Risk Register 	<ul style="list-style-type: none"> Health and Safety Kick-off Meetings and Orientations 	<ul style="list-style-type: none"> Document Management
<ul style="list-style-type: none"> Training Plan 	<ul style="list-style-type: none"> Ensure all operations are meeting Nalcor LCP Standards 	<ul style="list-style-type: none"> Coaching
<ul style="list-style-type: none"> Equipment Selection and Procurement 	<ul style="list-style-type: none"> Logistics/Transportation Oversight. 	<ul style="list-style-type: none"> Health and Safety Training (Confined Space, Energy Isolation, Step-Back)
<ul style="list-style-type: none"> Establish High Level Health and Safety Performance Standards 	<ul style="list-style-type: none"> Establish High Level Health and Safety Performance Standards 	<ul style="list-style-type: none"> Establish High Level Health and Safety Performance Standards
<ul style="list-style-type: none"> Define Vulnerabilities in Design, Construction, Procedures and Mitigations 	<ul style="list-style-type: none"> Track incident trends and implement mitigation measures. 	<ul style="list-style-type: none"> Track incident trends and implement mitigation measures.

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5.2 Lower Churchill Project Requirements- Health and Safety Integration

Health and Safety has been identified as a cornerstone of the overall Lower Churchill Project Requirements. It must be fully integrated into all phases of the project. Nalcor has elected to adopt the OHSAS 18000 (an internationally recognized ISO formatted standard for Occupational Health and Safety) as its standard for health and safety policies, procedures and programs for the corporation and the Lower Churchill Project.

The OHSAS methodology and requirements require full integration of Health and Safety into in all stages and aspects of the Lower Churchill Project. The Newfoundland and Labrador Occupational Health and Safety Act and associated regulations must always be considered as one of the documents to be consulted in support of the integration.

Effective planning for health and safety is essential if the LCP is to be delivered on schedule, without cost overrun, and without experiencing incidents or damaging the health of site personnel. A focus on continuous review, oversight and improvement must be undertaken and maintained to ensure the flawless execution of this project. The following chart reflects how health and safety will be integrated into the Lower Churchill Project:

Figure 3.0: Integrating Health and Safety with Lower Churchill Project Requirements:



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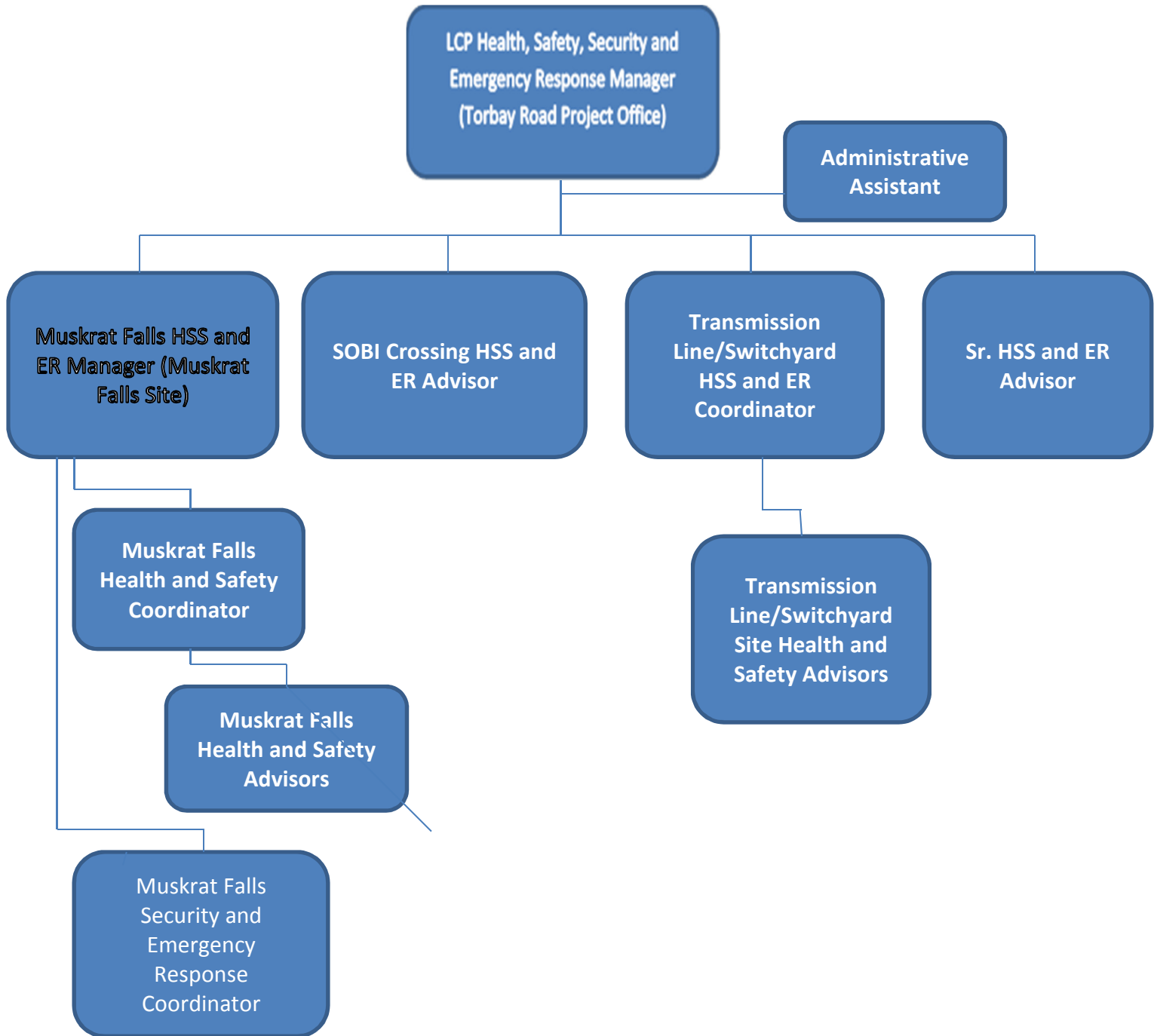
5.3 Health and Safety Organization – Lower Churchill Project

The Health and Safety Organization within the Lower Churchill Project will be provided with the appropriate level of support throughout the course of the project. The overall responsibility for safety performance on the project will be the responsibility of Nalcor Energy Corporation. However, Health and Safety support will engage the resources of all personnel to fully support through total buy in to the project standards, programs, policies and procedures.

As noted on the organizational chart on the next page, the Health and Safety Organization will include health and safety professionals from Nalcor, SLI and sub-contractors. The Health and Safety Organization is made up of the following support functions and organizations:

- The Project Delivery Team will have project oversight in terms of establishing governing corporate policies, procedures and programs. Corporate support includes oversight/auditing, policy and procedure development, safety and health initiatives and functional/directional support.
- The **Health, Safety, Security and Emergency Response Manager for the Lower Churchill Project**, located in St. Johns Torbay Road Office, will be providing functional support and expertise to the project as well as monitor and manage the overall health and safety direction of the Lower Churchill Project. Ensures consistency in direction, competencies, regulatory compliance, as well as implementation and application of Health and Safety policies, programs, procedures and strategies. The **LCP Senior HSS and ER Advisor** will report directly to the LCP HSS and ER Manager and provide technical HSS and ER Support for the LCP, as and when required.
- The **Muskrat Falls Health, Safety, Security and Emergency Response Manager** (located at the Muskrat Falls Site) will report directly the Muskrat Falls Site Manager with a functional reporting to the LCP HES, Safety, Security and Emergency Response Manager. **The Muskrat Falls Health and Safety Coordinator** will be responsible for monitoring, tracking and reporting day to day activities at the Muskrat Falls Site and will have **Health and Safety Advisors** reporting to this position. The Muskrat Falls Security and Emergency Response Manager will report to the Muskrat Falls HSS and ER Manager and providing support to Transmission Line/Switchyard Activities and Operations as well.
- The **SOBI Crossing HSS and ER Advisor** will report directly to the SOBI Crossing Project Manager with functional support from the LCP HSS and ER Manager.
- The **Transmission Line/Switchyard HSS and ER Coordinator** will report to Component #3 and #4 Site Managers with functional support from the LCP HSS and ER Manager. This position will also manage and direct activities of the **Transmission/Switchyard Health and Safety Advisors**, who will provide on-site Health and Safety Support.

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**Lower Churchill Project
Health, Safety, Security and Emergency Response (HSS&ER)
Functional Organization Chart**

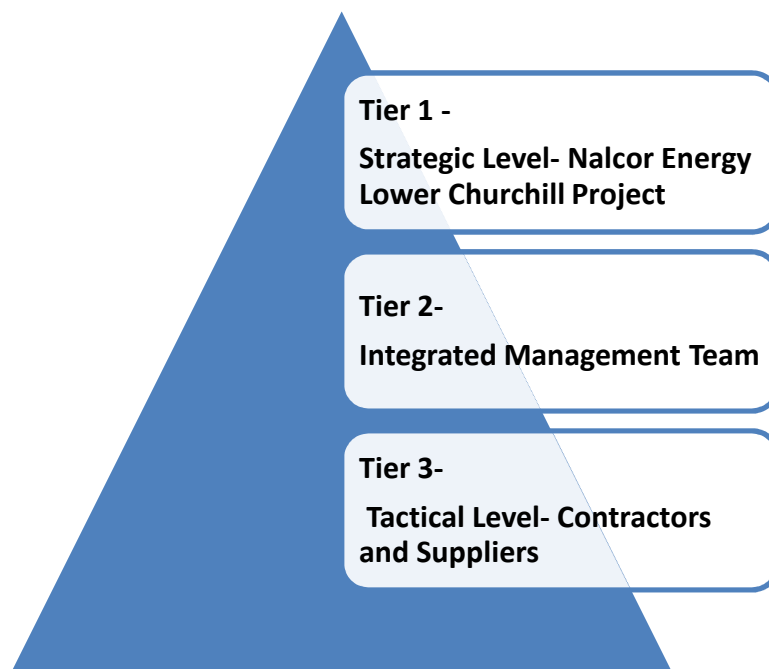
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6.0 Roles and Responsibilities:

This section denotes specific roles and responsibilities for key positions within the project team. If each individual filling these positions effectively executes these roles/responsibilities, the building of an effective health and safety culture will be assured.

The following chart (along with the explanation below it) identifies the three distinctive tiers with respect to how Occupational Health and Safety is typically managed in an Integrated Management Model and will be managed for the Lower Churchill Project. The Tiers identify the level of involvement for Nalcor Energy, the Project Delivery Team, as well as Contractors and suppliers- with each taking on a broader role. The chart also clearly defines roles and responsibilities within each tier level.

Figure 4.O: Occupational Health and Safety Management Roles and Relationships for Project Delivery Team Scope- Lower Churchill Project



Tier 1: Strategic Level

- Communicates and demonstrates Zero Harm- Nobody Gets Hurt Commitment.
- Establish LCP Safety Management System and Strategic Management Plan
- Establish expectations of Consultant’s Health /Safety Plan through Coordination Procedures
- Review and Approve Health and Safety Plan and Site Plans

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- Chair Project Level Health and Safety Steering Committee.
- Monitors Performance and coaches Consultants, Contractors and Suppliers to achieve desired outcomes.

Tier 2: Project Delivery Team

- Responsible for scope level management of work.
- Develops a LCP Health and Safety Management Plan based upon Nalcor’s Health and Safety Management Plan
- Develops Site Specific Health and Safety Plan for all work sites.
- Establishes the necessary plan enablers (people, processes and tools)
- Selects subcontractors and suppliers who are able to execute their work scope safely.
- Demonstrates Zero Harm- Nobody gets hurt commitment.
- Reviews and approves sub-contractors Health and Safety Management Plans
- Charters and Chairs site Health and Safety steering committee.
- Monitors performance and coaches sub-contractors to achieve desired outcomes.

Tier 3 Tactical Level

- Develops a Project Health and Management Plan based on its company Health and Safety Management Plan
- Develops Site Specific Health and Safety Plan(s) for its work site
- Utilizes its people, processes, and tools to manage work-face safety.
- Focuses on Task Based Hazard Management and Work Competency
- Participates in Health and Safety Steering Committees
- Proactively engage the worker to promote a “Zero Harm- Nobody Gets Hurt” mindset.

6.1 Project Director

The Project Director is responsible for ensuring the Lower Churchill Project – Health and Safety Management Plan is fully implemented and effective, providing input on strategy development for each project deliverable, sanctioning the manpower and resources necessary for implementation of the LCP Health and Safety Management Plan and holding personnel accountable for its implementation and continued maintenance. The Project Director communicates and coordinates with Nalcor Corporate Staff, as well as Project Staff on a daily basis.

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The Project Director's responsibilities from a Health and Safety perspective include (but are not limited to) the following:

- Clearly communicate health and safety expectations for the project.
- Demonstrate tangible commitment and involvement toward the relentless pursuit of safety performance excellence.
- Provide leadership for full implementation of safety and health policies, management systems and safety requirements to achieve health and safety objectives.
- Ensuring compliance with all applicable regulatory requirements is achieved and maintained.
- Be responsible for safety and health of personnel.
- Be a good role model for others to follow. Continually promote a high level of health and safety awareness.
- Periodically audit the health and safety programs effectiveness with the target for continuous improvement.
- Ensure all incidents are reported and investigated as required and corrective action taken to prevent recurrence.
- Ensure all core competencies and training needs are identified and training objectives outlined and achieved.
- Take all reasonable measures to prevent injuries to all personnel on the site (including visitors), who are exposed to hazards on the worksites under their control.
- Actively participate in safety plan activities
- Recognize significant safety achievements/accomplishments
- Reinforce health and safety as integral core values.
- Enhance workplace morale and attitudes

6.2 Project Managers

The Project Manager is responsible for ensuring the Lower Churchill Project – Health and Safety Management Plan is fully implemented and effective, providing input on strategy development for each project deliverable, sanctioning the manpower and resources necessary for implementation of the LCP-Health and Safety Management Plan and holding personnel accountable for its implementation and continued maintenance. The Project Manager communicates and coordinates with the Project Staff on a daily basis.

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The Project Manager’s responsibilities from a Health and Safety perspective include (but are not limited to) the following:

- Clearly communicate health and safety expectations to the respective Project Management Team.
- Provide effective leadership and guidance at the Project Management Level for full implementation of safety and health policies, management systems and safety requirements to achieve health and safety objectives.
- Demonstrate tangible commitment and involvement toward the relentless pursuit of safety performance excellence.
- Ensuring compliance with all applicable regulatory requirements is achieved and maintained during project planning, design, construction and overall execution of the project.
- Support and attend (where possible) the formal health and safety leadership training periodically.
- Be responsible for safety and health of all project personnel.
- Be an engaged role model for others to follow. Continually promote a high level of health and safety awareness.
- Assist the Project Director, as well as the Safety and Health Manager, to audit the health and safety programs effectiveness with the target for continuous improvement.
- Ensure all incidents are reported and investigated as required and corrective action(s) taken to prevent recurrence and communicated to others to prevent recurrence.
- Ensure all core competencies and training needs are identified and training objectives outlined and achieved within the Project Management Team.
- Take all reasonable measures to prevent injuries to all personnel on the site (including visitors), who are exposed to hazards on the worksites under their control.
- Actively participate in safety plan activities as well as periodic reviews.
- Recognize significant safety achievements/accomplishments
- Reinforce health and safety as integral core values.
- Enhance workplace morale and attitudes through effective communications, recognizing accomplishments and outstanding safety and health performance.

6.3 LCP Health, Safety, Security and Emergency Response Manager

The Nalcor Energy LCP Health and Safety Manager is responsible for ensuring the LCP-Health and Safety Management Plan is developed in conjunction with those developed by Nalcor Energy Corporate policies and best practices, regulatory guide lines, major contractors, and

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communicated to the Project Director, as well as all Nalcor Energy LCP managers, supervisors and employees, contractors, subcontractors and consultants.

The LCP Health and Safety Manager’s responsibilities include (but are not limited to) the following:

- Clearly communicate safety and health expectations for the project.
- Be responsible for promoting safety and health practices, policies and procedures for all personnel.
- Be responsible for establishing strong functional expertise in health and safety management, who are fully engaged in strategic-direction setting and day-to-day project delivery activities with Area/Scope Managers and Construction Managers.
- Provide technical expertise and guidance pertaining to safety and health related issues, conditions, incidents and actions.
- Take all reasonable measures to prevent injuries to all personnel on the site (including visitors), who are exposed to recognized hazards on the worksites under their control.
- Demonstrate tangible commitment and involvement toward the relentless pursuit of safety performance excellence.
- Coach Management and Supervisory Staff on effectively incorporating safety and health practices, policies and procedures as and when necessary
- Provide safety feedback to workers, supervisors, and managers
- Be a visible and effective role model for others to follow. Continually promote a high level of safety and health awareness.
- Actively participate in safety planning activities
- Coordinate formal Health and Safety leadership training for all levels of management and supervision.
- Recognize significant safety achievements/accomplishments in a timely manner
- Continually reinforce safety and health as integral core values.
- Enhance workplace morale and attitudes through effective interaction.
- Periodically audit the health and safety programs effectiveness with a target of continuous improvement and establish key performance indicators.
- Ensure all incidents are reported and investigated as required and corrective actions are taken to prevent recurrence. Communicate lessons learned from incidents and near misses to potentially affected personnel to better prevent recurrence.
- Ensure all core competencies and training needs are identified and training objectives achieved.

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- Monitor effectiveness of hazard evaluation and reporting process.
- Actively participate in the audit/assessment process, providing guidance, support and professional expertise.

6.4 LCP Health and Safety Management Team

The LCP Health, Safety, Security and Emergency Response Management Team responsibilities from a Safety and Health perspective include (but are not limited to) the following:

- Ensuring that supervisors, leaders and employees comply with the requirements of the LCP-Health and Safety Management Plan to the extent applicable to their respective mandates.
- Attend and participate in formal Health and Safety Leadership Training targeted at all levels of management and supervision.
- Ensuring that health and safety programs comply with contractual and regulatory requirements.
- Reinforcing that workers are informed of site specific hazards and conditions and are adequately trained in safe work practices and procedures.

6.5 Supervisors, Leaders and Employees

Supervisors, Leaders and Employees are responsible for:

- Fully understanding the LCP-Health and Safety Management Plan and communicating the specific requirements applicable to their team members and contractors ensuring that deliverables are met within the stipulated timeframes.
- Line Management will be held accountable for the Safety and Health Performance of their subordinates and contractors.
- Communicating health and safety expectations to your subordinates and always being a good role model and example.
- Actively participate in Health and Safety Plan activities.
- Ensuring compliance with all corporate policies, procedures and practices included in this Management Plan and applicable regulatory requirements.
- Confirming that all workers are suitably trained and adequately qualified and have sufficient knowledge and experience to perform their work safely.
- Participation in hazard assessments carried out at the work sites.

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- Promptly report high potential health and safety near-misses and incidents.
- Monitor the worksite and correct any unsafe conditions or unsafe worker behaviors promptly.
- Attend and participate in formal Health and Safety Leadership Training targeted at all levels of management and supervision.
- Ensure recognized hazards are eliminated to the extent practicable and ensuring any remaining identified hazards are adequately controlled/communicated to affected personnel. Identify and correct unsafe behaviors and conditions as soon as practicable.
- Always provide constructive feedback to subordinates.
- Continually assess leading and lagging performance indicators for trending to define and implement continuous improvement opportunities.
- Ensure appropriate personal protective equipment is readily available at the worksite, correctly used, stored and maintained and replaced when necessary.
- Be a safety resource and informal trainer/coach.
- Understand the capabilities and limitations of subordinates.
- Make every effort to enhance workforce morale and attitudes.

6.6 Project Delivery Team, Employees, Consultants and Staff

Project Delivery Team, Employees, Consultants and Staff are responsible for ensuring the LCP Health and Safety Management Plan is maintained and followed and identifying areas for continuous improvement to their respective managers and supervisors. Additionally, they are responsible for the following:

- Acquaint themselves with the recognized hazards that may exist in the activity they will be undertaking or the locations they will be working and the appropriate mitigating measures.
- Be a good role model to co-workers.
- Actively participate in Safety Plan Activities.
- Refuse to undertake unsafe work or utilize unsafe equipment believed to be unsafe.
- Perform all tasks with due regard to safety, as well as health and safety of co-workers, the public and the environment. Pre-plan safety as an integral core value.
- Participate in safety orientations, training sessions, programs and meetings and make positive suggestions to improve worker safety (utilize the SWOP program)
- Comply with all applicable safety policies, procedures, programs and regulatory requirements.
- Always use the required personal protective equipment and clothing.

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- Report all safety, health and environmental incidents, as well as near-misses to your supervisor.
- Continually evaluate your own competency and make every effort to enhance your skills and capabilities.
- Know your co-worker's abilities and limitations, as applicable.
- Always use the appropriate safety and personal protective equipment required for the job.
- Report all unsafe conditions, imminent danger and potential hazards to your supervisor immediately.

6.7 Contractors and Sub-contractors

Contractors are responsible for familiarizing themselves with the LCP-Health and Safety Management Plan and workers are orientated to the safety plan to ensure that health, safety and environmental objectives are achieved and maintained. All Contractors and Sub-contractors providing a service or support to the LCP-Health and Safety Management Plan are required to work in accordance with the provisions of this Plan.

Additionally, they are responsible for the following:

- Acquaint themselves with the hazards that may exist in the activity they will be undertaking or the locations they will be working as well as appropriate mitigating measures.
- Refuse to undertake unsafe work or utilize unsafe equipment believed to be unsafe.
- Perform all tasks with due regard to safety, as well as health and safety of co-workers, the public and the environment.
- Participate in safety orientations, training sessions, programs and meetings and make positive suggestions to improve worker safety.
- Comply with all safety policies, procedures, programs and regulatory requirements.
- Always use the required personal protective equipment and clothing.
- Report all safety, health and environmental incidents, as well as near-misses to your supervisor.
- Report all unsafe conditions, imminent danger and potential hazards to your supervisor immediately.

NOTE: All personnel related to the project are responsible for their own safety, the safety of their fellow workers and for applying these LCP-Health and Safety Management Plan principles to their work task each day.

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Utilizing a well-defined bid and selection process; Nalcor Energy-Lower Churchill Project Contractors are responsible for providing fully certified equipment onshore and offshore (where applicable) that meets its class designation including the equipment, crews, and Health and Safety management systems. The contractor also operates and maintains the right to the obligations defined in the Contractor's Health and Safety Policies and Procedures to ensure that health safety and environmental management is integrated into all of its business activities, all contractors will:

- Advise each manager, supervisor, employee and contractor of his/her Health and Safety Roles and responsibilities prior to job commencement;
- Comply fully with all applicable Health and Safety laws and regulations;
- Provide safe working rules, practices and procedures based on risk experience, safety knowledge and competent work direction;
- Assess all anticipated known risks prior to starting a new activity or one that is conducted very rarely;
- Ensure employees are qualified and trained to perform the tasks they are assigned;
- Make every effort to eliminate or minimize potential damage to equipment, vessel or environment;
- Investigate all incidents/accidents and take corrective action as appropriate;
- Ensure an immediate and effective response to emergencies is established and maintained and that all personnel understand their roles and responsibilities;
- Provide competent and trained professional staff to support Health and Safety activities;
- Monitor and report Health and Safety performance with a focus on continuous improvement; and
- Establish a strong Health, Safety and Environmental culture within all working groups/teams and contractor for The Lower Churchill Project.

Every employee of the main contractor has the responsibility to:

- Promptly report all hazards, incidents and near miss occurrences;
- Practice good "common sense" safety principles;
- Provide constructive ideas and concerns so as safety efforts and initiatives might be further strengthened;
- Become actively involved in the Health and Safety Program; and
- Comply with all federal, provincial and local regulations directly related to health, safety and environmental.

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The above objectives will be accomplished by implementing the Health and Safety Plan in conjunction with the Lower Churchill Project and Contractor Health and Safety Policies and Procedures, as well as the Newfoundland and Labrador OHS Act and associated regulations.

NOTE: In the event of a conflict within this plan and the contractor's plans, the most stringent requirement will always take precedence.

6.8 Accountability

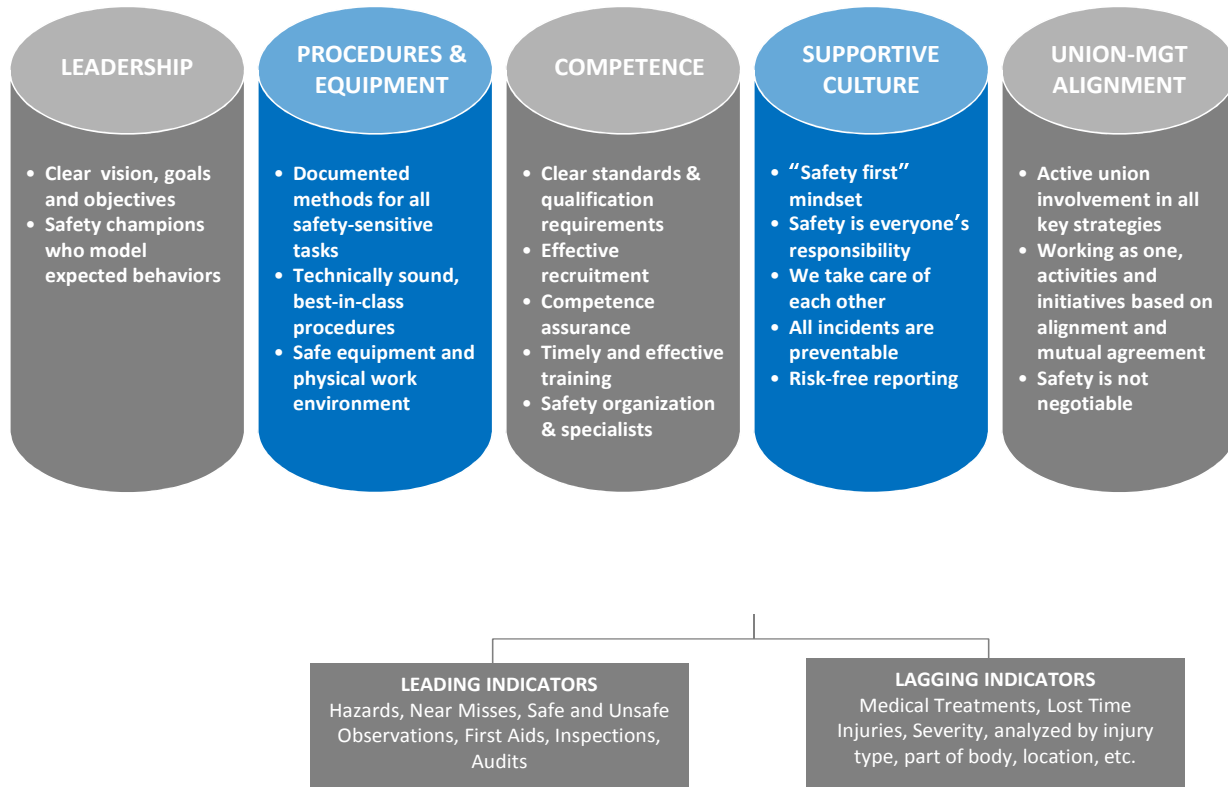
All Personnel working on the Lower Churchill project are accountable for:

- Establishing and maintaining Occupational Health and Safety through continually safeguarding the well-being of project personnel, the general public, and the environment through safe and environmentally responsible work practices associated with the design, construction and transportation of the Nalcor Energy-Lower Churchill Project structures and equipment;
- Continually striving to maintain an accident and incident free “Zero Harm – Nobody Gets Hurt” working environment at Nalcor Energy-Lower Churchill Project and its contractors work sites and
- Ensuring total compliance with all Health and Safety applicable regulations.
- All Personnel involved in the Nalcor Energy-Lower Churchill Project are accountable for keeping to the following Safety Rules:
- Ensure Health and Safety always remain core values within all aspects of the project and are not prioritized along with other business priorities;
- Always follow established Safe Practices and Procedures – if they are not safe, advise your Supervisor and have them changed or modified;
- Always challenge and correct wherever possible any Unsafe Acts, Conditions or Procedures that you observe or otherwise come to your attention;
- Report all Safety Observations and Undesired/Near Miss Events and use your Safe Workplace Observation Program (SWOP) cards; (see it – fix it – report it)
- Only start on a task when you have all the authorizations and permits in place; and
- Always STOP/Intervene a task if you are not satisfied that it is safe to continue or it presents a risk to others.

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7.0 Health and Safety Management System Framework

Figure 5.0: Health and Safety Management System Framework



The foundation of the Health and Safety Functional Management System Framework has been established and implemented based on the following:

- Safety Credo (Section 7.1- Figure 6.0))
- Health and Safety Policy, (Sections 7.2 and 7.3)
- Guiding Principles and Performance Objectives, (Section 7.4)
- Occupational Health and Safety Management Plan (A Management Plan that describes in detail of how the specific guiding principles and objectives will be achieved using specific enablers.),
- Enablers (People, Practices, Procedures and Tools that enable the implementation of the Plan.),
- Roles and Responsibilities (Section 8)
- Individual Behaviors and Actions. (Engaging personnel to act in a manner so as to minimize risk to the individual, the environment and stakeholders.).

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7.1 Safety Credo

Our approach to managing safety on the Lower Churchill Project is rooted within the Safety Credo. Every member of the Lower Churchill Project is expected to work in accordance to the Safety Credo (Section 9.0) and to utilize the available tools and procedures that are required to complete their job safely.

The safety of our employees, contractors, visitors and the public is our first and most important priority. Our goal is a workplace where nobody gets hurt -- zero harm -- and a working environment where each and every employee is always concerned for their own safety and the safety of others. Everyone on the Lower Churchill Project is personally committed to these basic safety values as the foundation for our success as a safety leader.

The Safety Credo has three (3) basic rules to live by:

- I always follow safety requirements and best practices
- I always take time to complete my work safely
- I always take action when I see unsafe acts or conditions

Figure 6.0: Safety Credo



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7.2 Health and Safety Policy

A written general policy statement can effectively reflect corporate management’s positive attitudes and acceptance of overall responsibility for health, safety and environmental protection. It demonstrates to NE-LCP managers, supervisors, employees, contractors, subcontractors, consultants and visitors that the health and safety of workers and the preservation of the natural environment is a priority and takes precedence over expediency and shortcuts.

The LCP Health and Safety Policy reflects the Project Delivery Team’s commitment to Health and Safety and forms the basis upon which the Health and Safety Management Plan, and as well as the LCP Health and Safety Management Plans of all Contractors, Suppliers, and Consultants working on the LCP is based.

This Policy and the goals embodied within it outline management’s commitment to maintaining a safety culture within our organization, in the organizations of our contractors and subcontractors and in all project activities. It mandates the tangible demonstration of this commitment through compliance with the Health and Safety Policy and by making continual improvement an integral part of activities.

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7.3 Nalcor Energy Corporate Occupational Health and Safety Policy



**Nalcor Energy
Occupational Health and Safety Policy**

The safety of our employees, contractors, visitors and the public is our first and most important priority. Our goal is a workplace where nobody gets hurt -- zero harm -- and a working environment where each and every employee is always concerned for their own safety and the safety of others. In support of this goal, Nalcor Energy and its employees are committed to the following guiding principles

- 1) Employees will govern their actions in accordance with Nalcor Energy's Internal Responsibility System for safety. This includes adherence to the principles of employee and role related responsibilities for their personal safety and the safety of their co-workers, contractors, visitors, and members of the public.
- 2) Nalcor Energy shall establish and maintain an Occupational Health & Safety Management System (HSMS) which:
 - a. meets or exceeds legislated requirements and is compliance with accepted industry standards and practice; and
 - b. documents health and safety objectives for Nalcor Energy; and
 - c. contains a mechanism for performance measurement and continuous improvement; and
 - d. facilitates both the formal and informal involvement of employees in the development, maintenance, and improvement of occupational health and safety within the organization.

 President and CEO
 Nalcor Energy

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7.4 Guiding Principles

The guiding principle upon which this Health and Safety Management Plan is built includes the following:

- All incidents are preventable.
- Ownership by senior management and on-site supervision is mandatory through direct involvement, a review of Health and Safety programs and efforts, and a focus on continuous improvement. Management must lead by example.
- Ensure appropriate resources and personnel are provided and available to execute the work safely and without adverse impact to health.
- Safety is a line organization function and cannot be delegated.
- As reasonable and practicable, Project Delivery Team has an obligation to eliminate or mitigate all known hazards and to ensure workers are fully competent and are supervised by a competent individual in the tasks to be performed.
- Management must understand and incorporate various safety practices and processes within the LCP and recognize when work activities, practices and procedures come in conflict with one another and instituting measures for mitigation.
- All Project Delivery Team personnel and contractor personnel associated with the work have the right to be aware of the hazards, the right to participate, and the obligation to stop unsafe work without retribution.
- All personnel associated with the work are empowered to contribute to the Health and safety efforts.
- Safety performance requires establishing procedures and programs, conducting training, contractor employee involvement, routine self-evaluation, and continuous improvement.
- Prospective contractors must clearly understand that past health and safety performance will be part of the criteria used to select contractors to perform work for the LCP.
- When necessary, a contractor is expected to improve or implement processes where gaps exist between their programs and the LCP's expectations.
- Continuous improvement must be a permanent objective for the LCP. Opportunities for improvement must be identified, evaluated and applied systematically and logically.

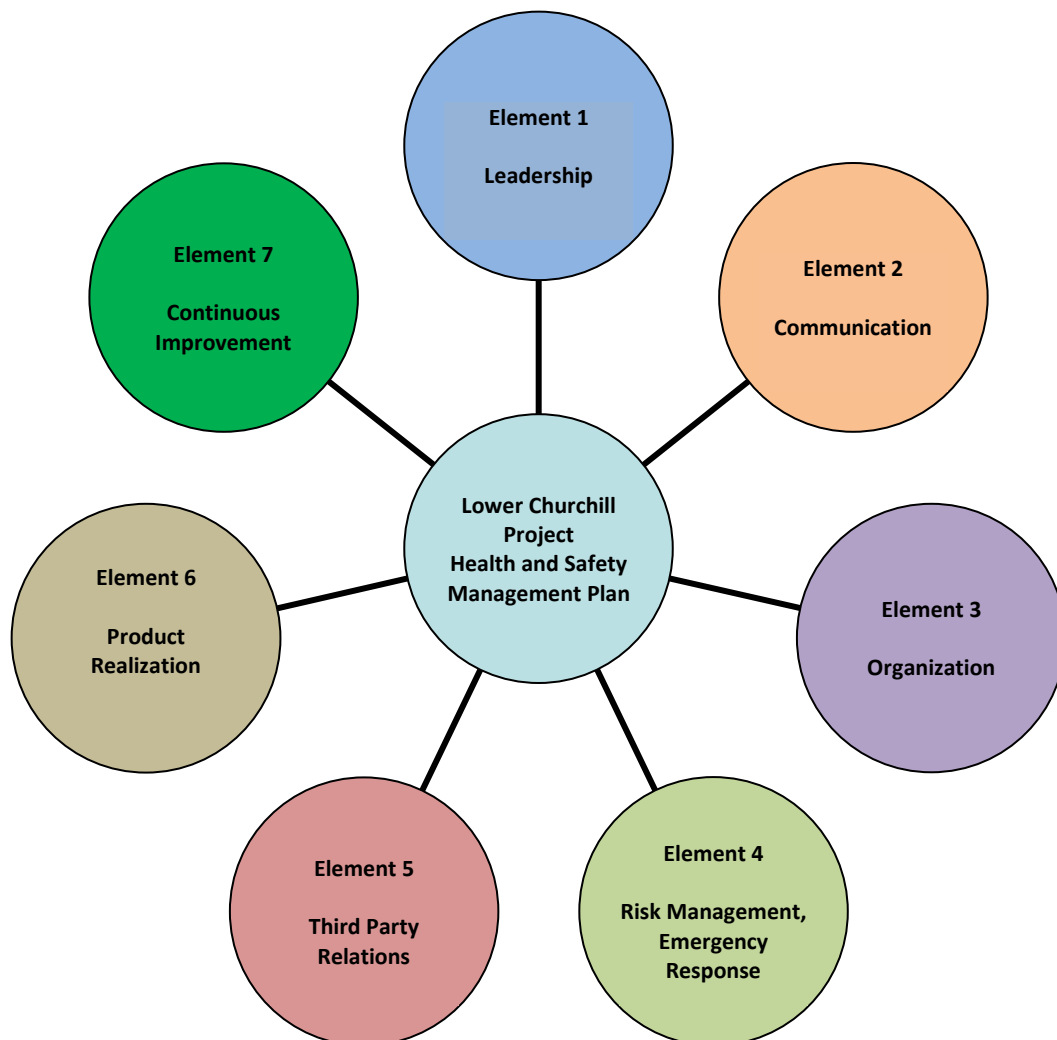
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7.5 Health and Safety Management Plan Format

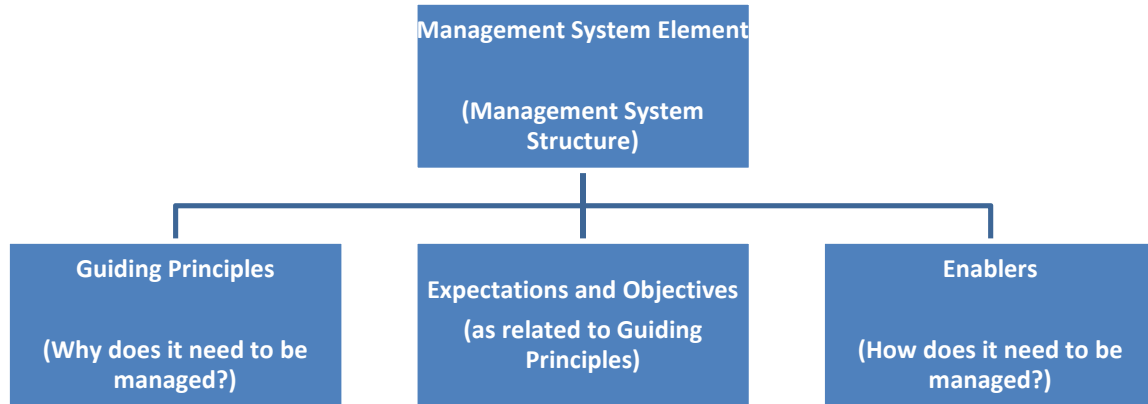
The LCP Health and Safety Management Plan is structured in accordance with the OHSAS 18001 Plan-Do-Check-Act Model for continuous improvement. It also incorporates the seven core elements of Health and Safety Management as noted below:

Figure 7.0: Seven Core Elements of Health and Safety Management

The Health and Safety Management Plan is structured to be both user-friendly and a useable resource. The basic format of the Plan includes a listing of sub-elements, guiding principles and enablers as defined below:



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7.5.1 Element 1: Leadership (Commitment, Personal Behavior, Accountability):

The Project Delivery Team is responsible for supporting the development, implementation and assessment of safety and health initiatives and control mechanisms addressing emerging issues and providing feedback as and when appropriate. The Project Management Team must establish the overall tone of Health and Safety Management and its foundation of the project’s overall culture.

Leadership Expectations: It is expected that all members of the Project Delivery Team will:

- Ensure that a positive Health and Safety Culture and Management System are established, implemented, communicated and supported at every level of the organization
- Communicate health and safety performance expectations to others.
- Visibly demonstrate their commitment to the achievement of the Project’s Health and Safety goals and objectives.
- Be interested, visible and active in promoting Health and Safety processes and initiatives.
- Deal promptly and appropriately with Health and Safety improvement actions and suggestions within their area of control.
- Give appropriate consideration of Health and Safety performance as a key indicator of overall performance requiring equivalent management effort.
- Establish and maintain the standard for acceptable Health and Safety behaviors within the project by setting a model example themselves.

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- Nominate Health and Safety Management Representative responsible for the overall coordination of the Management System and ensure the representative is trained in each of the Management Elements, expectations and roles responsibilities.
- Allocate appropriate resources to achieve our health and safety priorities and objectives.
- Where applicable, a clear Zero Tolerance policy is communicated to all employees (Examples include Drug and Alcohol Policy, Workplace Violence/Horseplay, etc.)
- A clearly defined disciplinary program must be communicated to all employees and applied fairly and uniformly.
- A clearly defined substance abuse prevention policy is posted and included in orientation literature
- Business Code of Conduct is posted and in place

Demonstrating Health and Safety Leadership: The Project Management Team can demonstrate Health and Safety Leadership by the following:

- Carry out site visits with the principle objective to review, discuss or promote Health and Safety issues.
- Establish, Manage and Track Project and Individual Health and Safety performance toward established goals and objectives. Promote overall Health and Safety Performance Awareness.
- Make health and safety a key agenda item at Management Meetings.
- Taking a proactive approach to the prevention of incidents as an integral part of our operations overall.
- Become actively involved in Health and Safety Coordination and Steering Committee (JOHS).
- Strive to achieve all aspects of personal health and safety performance contract.
- Include health and safety roles, responsibilities and accountabilities in manager’s job descriptions.
- Include health and safety performance as an integral part of the performance appraisal process.
- Include the nominated health and safety Management Representatives on the organization chart.
- Ensure effective health and safety Orientation Programs are in place covering Safety Standards, Policies, Procedures and Core Values.
- Enable Supervisor health and safety Responsibility to be provided periodically.
- Provide Behavior based health and safety Training Programs periodically.
- Ensure Behavioral observations are performed.

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- Encourage health and safety Surveys be performed, analyzed and used to establish corrective actions, as appropriate.

Taking Personal Responsibility: The Project Delivery Team, as well as personnel at all levels, must take personal responsibility for Occupational Safety and Health. To accomplish this, all personnel should exhibit the following:

- Sincere caring for others, their safety and their well-being.
- Be aware of their influence as a role model at work and during their spare time.
- Sound health and safety behavior on and off the job.
- Intervene constructively with at-risk behaviors and conditions
- Are attentive to others behavioral changes, and respond appropriately
- Follow defined Health and Safety policies, procedures, rules and standards.

Understanding Accountabilities: Everyone associated with the Lower Churchill Project, its operations and activities is accountable for their actions. Deviations from standards of acceptable behavior are dealt with in a fair and consistent manner. Personnel at all levels of the organization must:

- Understand what is expected and are held accountable for their actions and inactions.
- Use their authority and responsibility to react to all observed or known at risk behaviors or unsafe conditions.
- Respond in an open and fair manner to incidents reported and issues raised.
- Practice tolerance for mistakes but are aware of and accept consequences for reckless behaviors.
- Must be open and receptive to constructive feedback from others.

7.5.2 Element 2: Communications (processes, information and documentation)

Effective and open communications are essential to the success of any project. Successful internal communication is crucial to the development of an informed and motivated workforce. Efficient external communications preserves Nalcor’s reputation and enhances our business standing and credibility.

Communications Expectations: For effective communications, arrangements must be made which ensure that Managers can:

- Identify, develop and maintain systems for the control of information necessary for working safely and assure regulatory compliance with health and safety issues.

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- Ensure that personnel are properly informed of health and safety risks and control measures.
- Encourage employees at all levels to raise health and safety concerns without reprimand and shall respond to these concerns in a timely and appropriate manner.
- Fully support consultation on health and safety matters to explore opportunities for influencing issues.
- Ensure health and safety campaigns and initiatives receive adequate publicity.
- Support health and safety representatives and committees to contribute to the Project's health and safety performance.
- Establish an effective channel between management, employees, third parties and clients concerning existing, new or evolving health and safety issues.
- Encourage Personnel at all levels to give feedback, propose improvements, share information and best practice.
- Support proper liaison with clients, contractors, sub-contractors and external bodies on health and safety issues occurs.
- Ensure that the LCP is represented on industry bodies and positioned to influence and shape Health and Safety policy and regulatory matters.
- Health and Safety achievements are given due publicity and recognition.

Establishing Effective Health and Safety Communications: Effective communications can be achieved through effective training, interaction, forums, policies, programs and health and safety meetings. The following Health and Safety Communication tools have been put in place to enable effective communications:

- Periodic health and safety meetings/daily toolbox talks carried out at the worksite.
- Health and Safety Representatives committee meetings (JOHS Committee)
- New Employee Orientation Sessions
- Periodic Project newsletters
- Health and Safety bulletins and alerts (Communicating Lessons Learned)
- Industry forum representation and participation
- Management site visits with focus on Health and Safety
- Meetings with clients, contractors/subcontractors on health and safety issues.
- Emphasize and promote health and safety publicity campaigns
- Effective communication channels are in place without filtering mechanisms
- Forward communications which outline changes to health and safety practices, policies and procedures

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- Training programs reviews carried out periodically to ensure current technology, applicable risks and regulatory requirements are addressed
- Employees suggestion program
- Encourage use of a Safety slogan/theme program
- Participate and support Safe Work Observation Program (SWOP)
- Track leading and lagging indicators

Expectations concerning Information and Documentation Management: The availability of accurate, relevant and current information and documentation is a key contributor to successful health and safety performance. Processes for capturing and sharing knowledge are in place to deliver the best available health and safety practice to our operations. Effective information and documentation management systems are in place such that:

- Drawings and other pertinent documentation necessary for health and safety compliant operations are identified, current and readily accessible.
- All applicable regulations, codes and standards are identified, current and readily accessible.
- Document retention and archiving requirements are established and satisfied.
- The currency of the system and procedures is ensured.
- Roles and responsibilities in relation to information and documentation management are clearly understood.
- Appropriate use is made of electronic information management systems.

Effective Information and Documentation Management Mechanisms: The following mechanisms and management systems can be utilized to effectively store, research, retrieve and retain Project Information and Documentation:

- Integrated Management System
- Document management system
- Health and Safety plans and interface documents
- Health and Safety library and databases
- Internet
- Communicating Health and Safety Regulatory Changes and Interpretations
- Document Retention Procedures/Programs.
- Document Disaster Recovery Procedures

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- Periodic Assessment/Audits of Informational Systems for Effectiveness, Compliance with Policies and Procedures.
- Regulatory Compliance Plan in place.
- Lessons learned capture and implementation process.

7.5.3 Element 3: Organization (competence, personal development, roles/ responsibilities):

The success of Health, Safety and business performance within the Lower Churchill Project is largely influenced by the competency of employees, contractors and sub-contractors. While the maintenance of a stable, competent and motivated workforce is also a critical factor. In order to ensure competency and personal development, Managers will assure that:

- Effective recruitment, selection and placement processes are in place and fully functional.
- Health and Safety competence requirements are identified, gaps analyzed and training programs are in place to close the gaps.
- A health and safety mindset and competence requirements are applied in recruiting, selection, succession planning and promotion at all levels.
- Personal appraisal/performance and development reviews are undertaken for employees.
- LCP employees are encouraged and supported in their career development.
- To the extent practicable, succession planning is in place.
- Ensure that a comprehensive training program is in place for all individuals to ensure the correct level of competence and health and safety awareness is attained prior to any change in their job duties.
- Health and safety training is provided by competent personnel and its effectiveness is properly reviewed.

Means to Accomplish Workforce Competency and Personnel Development: Occupational Health and Safety must be included as a part of overall:

- Recruitment, selection and placement procedures.
- Resource forecasting and allocation.
- Project site inductions.
- Position/role descriptions including competency requirements.
- Succession planning.
- Competency Assurance Systems/Testing and Verification.
- Personal appraisal and development programs, including a review of overall health and safety performance

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- Training need analysis
- Training matrices / plans
- Program effectiveness evaluation including review of assigned tasks and targets with respect to health and safety roles.
- Competence training in health and safety policies and procedures, hazards awareness and required certifications

Understanding Roles and Responsibilities within the Organization: The defining and understanding of individual roles and responsibilities are key to the achievement of our project health and safety objectives. It is very important that the appropriate level of resources is allocated and responsibilities are clearly defined and communicated. To do so, arrangements must be in place to ensure that:

- Health and Safety roles and responsibilities are a clearly defined and integrated part of all job task roles, and are clearly communicated and understood.
- Appropriate resources are allocated to enable Project Delivery Team to reach its Health and Safety objectives.
- Appropriate health and safety resources are allocated in relation to project execution.
- A health and safety function is in place to support the organization, is identified on organization charts, and reports at the highest appropriate level within the organization.
- Health and Safety committees and representatives are appointed, their roles are defined and they are involved in health and safety processes at all levels

Policies, Procedures and Programs for Assuring Competency/Personal Development: The following policies, procedures and programs are in place within the Lower Churchill Project to assure competency and personal development:

- Recruitment, selection and placement procedures.
- Resource forecasting and allocations.
- Position descriptions which include clearly defined health and safety competency requirements.
- Orientation/ Induction training program focusing on these expectations given to all employees
- People surveys and interviews.
- Site health and safety procedures.

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- Health and Safety resources included in budgets.
- Health and Safety function identified on organization chart and participates in business management meetings as appropriate.

7.5.4 Element 4: Management of Risk/Emergency Preparedness/Health (risk assessment, emergency preparedness, occupational health, MOC)

The Lower Churchill Project must ensure that Occupational Health and Safety Risks arising from, or associated with its activities are identified, addressed and effectively managed, so as to eliminate or reduce them to a level that is as low as reasonably practicable (ALARP). An effective means of risk management must be in place and fully functional and ensure the following:

- Health and Safety risks are identified and their consequences and probabilities properly assessed to ensure that risks, so far as reasonably practicable, are assessed based on probability of occurrence, risk, severity, consequences to personnel and the environment and are controlled utilizing the following hierarchy (preferred actions to least desirable actions): a) Risk Elimination, b) Engineering Design to Mitigate Risk, c) Incorporate Safety Devices for Risks that cannot be mitigated, d) Provide Warning Devices or e) Personal Protective Equipment.
- Appropriate risk reduction or mitigation measures are identified and implemented and managed to completion.
- Risk assessments are facilitated and undertaken by competent personnel including, where necessary, expertise external to the Project.
- Risk assessments are subjected to an appropriate review and validation process.
- Risk assessments are properly documented and action items closed in a timely manner.
- Affected personnel are made aware of, and understand risk assessment results and recommendations relating to their activity.

Enabling Measures to the Risk Assessment/Mitigation Process: The following processes can assist with the execution of an effective risk assessment/mitigation task:

- Risk Policy is in-place and supporting risk management program which includes the assessment of Health and Safety related risks.
- Ensure identified risks are addressed at the appropriate level within the project organization, given the nature and magnitude of the risk.

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- Ensure adequate risk control equipment/practices are included as part of design, construction and operations.
- Risk register and risk mitigation / control plan are in-place and updated periodically.
- Risk mitigation /control measures are effectively communicated to all affected personnel.
- Throughout the project execution phases perform various health and safety specific risk assessment / management activities.
- Conduct risk/hazard assessments, including the following techniques: HAZID (Hazard Identification), HAZOP (Hazards Operability Analysis), QRA (Quantitative Risk Assessment), FTA (Fault Tree Analysis), FMEA (Failure Modes and Effects Analysis).
- Conduct constructability assessments with due consideration of Health and Safety Factors/Issues.
- Conduct Task Based Risk Assessments (TBRA- Refer to Section 13.1))
- Implement Step Back 5 x 5 (Utilizing the 5x5 Risk Matrix to evaluate a particular work tasks)
- Implement WHMIS
- Conduct Manual and Equipment handling risk assessments (Refer to Section 13.1)
- Conduct ergonomic assessments
- Conduct fire risk assessments
- Implement hazard recognition and reduction methods included in training

Changes in operations, organization, facilities, systems and procedures must be properly evaluated and managed in such a way as to minimize any potentially adverse Health and Safety impacts. Best Practices should be captured during the transitional phase. For changes of this nature, the following measures must be in place to allow for proper assessment and control:

- Organization, staffing, roles and responsibilities for change management
- Management systems, processes and procedures
- Facilities, plant, process and equipment
- Work scope/tasks include change management documentation requirements.
- Regulations, procedures and standards
- Changes are appropriately documented, reviewed, approved, communicated and authorized prior to execution
- Change implemented is periodically monitored and reviewed and any action items resulting from the review are addressed in a timely manner prior to change closure

Enabling measures for Managing Risk as a result of Changes to Organization, Facilities, Systems and Procedures:

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- Management of change process
- Personnel transfer/promotion processes
- Change control processes and procedures
- Levels of authority for change approval
- Monitoring, audit and review processes
- Change item action tracking
- Document/Communicate Changes
- Review/Approval Process
- Work scope changes
- Matrix of compliance related to authority rules and regulations.
- Monitoring, audits and review process
- Revision controlled technical documents

Emergency Preparedness is essential in order to protect personnel, the environment and assets. Emergency Response Plans are in place to allow us to respond effectively and efficiently in the event of an actual emergency. In order to effectively respond to an emergency, the following systems, plans, procedures and training must be in place:

- Emergency response plans are based on an assessment of potential incidents and threats, and are documented and well understood by all affected parties
- Emergency response management plans/programs must reflect the uniqueness/specifics of the work and associated work locations.
- Personnel with emergency response roles and responsibilities are fully trained and competent
- Appropriate emergency response facilities and equipment are provided and maintained in fully operable condition.
- Personnel security is assessed and included in emergency response plans.
- Interface arrangements with contractors, subcontractors and the community include well defined emergency response responsibilities.
- External communication roles concerning emergency responses are documented and understood by all parties.
- Emergency response drills and exercises are undertaken regularly.
- The competency of those involved in ER is assessed on an ongoing basis.

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Emergency Response Plan Effectiveness/Efficiency: To best ensure the effectiveness and efficiency of the Emergency Response Plan, the following will be implemented at the Project Office and/or Field Construction Sites:

- Coordination procedures and documents clearly defining Emergency Response roles and responsibilities with contractor interface.
- Emergency Response procedures and plans have been established and organization will be fully trained
- New employee / visitor orientation includes Emergency Response overview and discussion of specific roles and responsibilities.
- Periodic Emergency Response drills and exercises will be carried out with the target of continuous improvement.
- Emergency Response training conducted including hands-on and simulated exercises, as appropriate.
- Duty rosters established and maintained current insuring that all key positions will be fully manned.
- Emergency Response facilities on site established and maintained in fully operable condition (e.g. first aid equipment, firefighting equipment, and emergency phone numbers posted at conspicuous locations).
- Evacuation plans prepared and in place and known to appropriate personnel.
- Equipment inspection records established and maintained current.
- Media interface training for emergency situations.

Occupational Health: The Lower Churchill Project will actively monitor its activities to ensure that appropriate measures and programs are in place to protect our employees from harm as a result of occupational health hazards. To accomplish this, Managers will ensure that:

- Prevent occupational illness or injury to the Project Team and field workforce by managing medical, public health and occupational health risks.
- Minimize the seriousness of injuries and illnesses by ensuring access to quality primary and emergency medical care.
- Ensure that well planned, well documented and drilled procedures are in place for responding to remote medical incidents requiring significant medical attention and/or evacuation.
- Verify that all National, Provincial and Local Health Regulations are incorporated in Project plans and facility designs.

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- Ensure satisfactory health management of Project sites through Health inspections and surveillance.
- All employees are encouraged to raise occupational health issues and concerns as they arise.
- Establish expectations that construction and installation contractors implement procedures and programs for ensuring healthy working conditions for personnel during the course of the project.
- Ensure communication of known health related hazards and remedial measures to all affected personnel.
- Ensure that project activities do not inadvertently affect the health of project personnel or local communities.
- Appropriate corrective/ preventative measures are implemented in a timely manner.
- Follow-up actions are taken to ensure appropriate provisions are adopted and fully implemented.
- Identify and implement regulatory and best practice medical practices, procedures and programs.

Implementing Health Measures and Programs: Methods for Implementing Measures and Programs designed to protect all personnel from harm as a result of Occupational Health Hazards include the following:

- Employee Health Questionnaires
- Food Services Contractor Health Plans must be prepared and periodically reviewed/updated which include organization charts, medical emergency response, worker immunizations/medical evaluations, known health risks, training requirements and health inspections, food handling, preparation and storage requirements.
- Ensure all personnel are fully trained and prepared for working conditions in Newfoundland and Labrador.
- Applicable periodic physicals
- Health communications through bulletins, e-mails, programs, training and procedures.
- Follow-up medical examinations, as identified and applicable.
- Medical evaluations for known and specified regulated activities
- Health Risk Assessments
- Worksite Health Assessments
- Worksite Health Inspections
- Health Awareness Training

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- Health Related Awareness Bulletins
- Budget for medical and health assessments related to remote project locations, during planning phase.

7.5.5 Element 5: Third Party Relations (Clients/Partners, Contractors/Suppliers, Community)

Establishing and Maintaining Effective Client/Partner Relationships: Effective Client and Partner interfaces and working relationships are critical for the Lower Churchill Project and for our common Health and Safety Performance. We work closely with clients and partners to manage our roles and align expectations and goals. Arrangements must be in place to ensure that:

- Health and Safety expectations, objectives, responsibilities, roles and interfaces are clearly defined, documented and agreed between the involved parties.
- An open dialogue on Health and Safety issues is retained at appropriate levels within the organization.

Client/Partner Interface Processes: Processes that enable more effective Client/Partner Interfaces include the following:

- Health and Safety meetings (or segments of meetings)
- Bridging documentations
- Audit plans
- Reporting processes
- Role and responsibility definitions.

Third Party Contractors and Suppliers: The risk presented by third parties (contractors/sub-contractors and suppliers) can have a significant impact on the Project's health and safety performance and reputation. Such risks need to be properly managed to minimize potentially adverse effects. Third party health and safety performance is reflected in the overall LCP performance. To maximize Health and Safety Performance, the following must be considered and implemented:

- Third parties are selected based in part on consideration of their Health and Safety performance, planning, programs, policies and procedures.

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- Health and Safety programs and overall compatibility with the Project’s Management Systems.
- Third parties Health and Safety standards must be broadly similar to those of the Project and are appropriate to the risk criticality of the services and products provided.
- Suppliers and sub-contractors are involved at an early stage to allow risks to be identified and properly managed.
- The Project requirements with respect of Health and Safety Responsibilities and performance are defined and communicated to third parties.
- Third parties have clearly defined roles and responsibilities for their individual managers.
- Interfaces between the Project and third parties is clearly defined and effectively managed.
- Monitoring of third party performance includes Health and Safety and deficiencies are identified and corrected and preventative measures are put in place.
- Contractors/subcontractors and suppliers understand that consequence for poor Health and Safety performance, or lack of agreed improvements, can be up to and including stop work orders and in extreme cases termination of work
- Lessons learned from third parties are captured and openly shared within the Project Delivery Team.

Effective Selection Processes: Processes that enable the effective selection of contractors and suppliers include the following:

- Selection strategy documentation for major and minor package suppliers
- Contractor pre-qualification and selection process
- Pre-bid Meeting reviewing Health and Safety Expectations with bidders
- Pre-contract award Health and Safety assessment
- Safety performance terms and conditions included in contracts
- Health and Safety Coordination Procedures contained in all contracts
- Health and Safety development program/improvement plan
- Regular meetings with all contractors
- Site visits to Contractor/Supplier Worksites
- Interface documentation review
- Performance monitoring plans and strategies
- Periodic Performance Audit and associated follow-up
- Contract and/or project close-out reports
- Contractor Health and Safety Plan prepared to address the specific scope of work

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Relationships with Neighboring Communities: Keeping good community relations are crucial for our long term success. In the course of the Lower Churchill Project, we must be focused on being a good neighbor and seek to find opportunities to contribute to the well-being of communities in which we operate. Effective means of ensuring good relationships are maintained with Neighboring Communities include ensuring the following:

- Risks to the communities associated with the Lower Churchill Project are openly communicated to the appropriate parties in a timely manner.
- Our project contributes in a positive manner to the communities where we operate.
- We cooperate with authorities, non-government organizations and industry organizations on health and safety matters.

Maintaining Effective Relationships: Good relationships with the Neighboring Communities of the Lower Churchill Project worksites are very important to the overall success of the project. Effective means of maintaining Community relationships include the following:

- Emergency response plans (including the focus on the neighboring community)
- Open facility and family days with health and safety focus, as and when appropriate.
- Health and safety initiatives with local schools, and voluntary groups
- Stakeholder management plans that include consideration for health and safety issues through all phases of the project.

7.5.6 Element 6: Product Realization: (Equipment and Materials)

Interfaces and relationships with clients and partners are critical for the Lower Churchill Project overall Health and Safety performance. The Project Delivery Team will work closely to manage our roles and align expectations and goals. To accomplish this, the following arrangements must be in place:

- Proper selection and specification of the facility, equipment and materials take place.
- Effective procurement processes and quality control systems are in place to minimize risk importation.
- Facility, equipment and materials provided are safe, compatible, of good quality and fit for their intended service and are renewable/recyclable (whenever possible).

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- Fully compliant with equipment inspection, certification, quality assurance and maintenance requirements.
- Appropriate information, instruction and training on the safe use, handling storage and environmentally sound methods of disposal of plant, equipment and materials are made available to affected personnel.

Ensuring Project Facility, Equipment and Materials meet Project Expectations: Ever effort will be made to ensure that applicable standards, standard industry practices and regulatory requirements utilizing the following processes:

- Specification and procurement processes are in place and reviewed periodically.
- Operating, inspection and maintenance procedures including health and safety stipulations.
- WHMIS assessments/product data sheets.
- Certification plans are in place and reviewed periodically.
- Information, instruction and training are current, available and reviewed.

7.5.7 Element 7: Continuous Improvement (Incident Investigation and Analysis, Audits, Measurement Review and Improvement Initiatives):

A continuous improvement mechanism must be implemented to consistently evaluate the mechanisms and controls being utilized to achieve the key safety elements. The following are effective means of evaluating the key safety elements:

Audits and Assessments: Audits/assessments are often utilized as a prudent means to monitor compliance and help elevate continuous improvement. On the LCP, Project and Regulatory requirements will be audited periodically to ensure effective management. Audits, assessments, and performance review activities and systems are various means to assure compliance with both internally and externally imposed standards within the project. Arrangements for audits and assessments will include the following:

- Audit programs that specifically address Health and Safety practices, policies and procedures that are in place and ensure they are followed.
- Audit scopes and frequencies are risk based.
- Audits are conducted by competent persons.
- Findings and actions are agreed with auditors and well documented.
- Audit results are communicated to the appropriate level of management.

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- Lessons learned are shared with appropriate parties.
- Audits will be carried out to regularly assess compliance with the elements of the Health and Safety Management Plan.
- Periodically, assess compliance with health and safety regulatory requirements will be evaluated.
- Audits may also be performed by personnel outside the project, having health and safety expertise and auditing expertise.
- Auditors are identified, notified and involved in the planning and process to the appropriate level.
- Findings are properly communicated to auditors and to an appropriate level of Project management, along with any trends noted.
- Findings resulting from an audit are assessed, documented, prioritized and monitored until satisfactorily resolved.
- Audit entitlement/expectation is agreed with clients and documented in contract and interface documents.
- Properly constituted management reviews will be undertaken periodically.
- Effective health and safety audit procedures are in place to evaluate compliance with work procedures, work rules and permits for critical tasks/activities

Audit Effectiveness: To ensure overall audit effectiveness, the following procedures, programs and follow-up must be in place:

- Documented Audit programs and defined schedules
- Auditing procedures and well defined protocols
- Auditor training program
- Timely Audit reports, Responsible Individuals Assigned Actions (as appropriate), Target Dates for Completion and Follow-up
- Internal and external audits are conducted
- Periodic Review of Audits, Audit Trending and Communicating Trends to Management.
- Interface documents
- Multi-faceted/disciplined teams to perform the audit.

Measurement and Review: Interfaces and relationships with clients and partners are critical for our overall health and safety performance. We will work closely with clients and partners to manage our roles and align expectations and goals. This will be further enhanced using the following:

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- Leading and lagging health and safety indicators are measured, reviewed and used as input to generate improvement initiatives.
- Health and Safety feedback from all parties is used as input to improvement plans.
- Health and Safety driven management reviews are conducted periodically.
- Improvement plans include data from all available and applicable sources.
- Processes exist to manage health and safety improvement actions to completion.
- Health and Safety improvement plans are considered in the Project strategy process.

8.0 Contractor Management

For onshore and offshore (where applicable for the SOBI work) construction, exploration and development operations the work activities will be performed using contracted equipment and personnel. The competency and behavior of the contractors along with their integration into the operation as a whole can have a major impact on health, safety and environmental performance. Where applicable, LCP will ensure union management on health and safety are working cooperatively in the achievement of its vision. The Nalcor Energy-Lower Churchill Project will strive to engage reputable and fully qualified contractors who have demonstrated an ability to conduct their activities in a manner consistent with the Nalcor Energy Health and Safety core elements as outlined above. The Lower Churchill Project has established certain minimum requirements and expectations that will ensure contractors conduct their activities in a safe and environmentally sound manner. These requirements form the basis of the Nalcor Energy guidelines and are conveyed to prospective contractors during the bid process.

8.1 Contractor Selection Criteria

All contractors are formally evaluated on their health, safety and environmental performance prior to awarding of a contract. To assist Nalcor Energy LCP in evaluating the quality and effectiveness of contractors' health and safety management systems, each prospective contractor will complete and submit, in support of the bid proposal, Nalcor Energy LCP Bid Evaluation Questionnaire that provides an overview of the contractors Health and Safety management system in terms of the following:

- Health and Safety Policy and commitment
- Management Involvement and Leadership
- Hazard Assessment and Risk Control
- Appropriate Safe Practices, Procedures and Rules

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- Training Program including Orientation and Competency
- Communications/Health and Safety Meetings
- Incident Reporting, Investigation Policy and Analysis
- Regulatory Requirements/Compliance Plan
- Personal Protective Equipment (PPE) Policy and Program
- Environmental
- Emergency Preparedness
- Accident Statistics and Records
- Modified Work Programs/ Early Return to Work
- Maintenance Policy and Programs
- Substance Abuse and Testing and Accommodation Programs
- Subcontractor Management and Control Programs.

8.2 Contractor Health and Safety Performance Measurement

Details and frequencies of any monitoring, audits and review of health and safety performance are contained in the Contractor's overall Performance Reporting Procedures and the contractor's management systems.

Health and Safety statistics are prepared on a monthly basis by the Health and Safety Coordinator and forwarded to the Project Delivery Team for review. Additionally, a monthly update will be provided to the project management team including the contractor's workforce to provide feedback on Health and Safety performance and facilitate opportunities for continuous improvement.

The Lower Churchill Project will ensure the timely follow-up and completion of corrective actions identified through field inspections, audits, incident investigation and safety meetings. It is the responsibility of the Senior Manager on a work site or marine vessel to ensure that all corrective actions are implemented and closed out in a timely basis. It is the responsibility of the Contractor Health and Safety Manager to ensure that actions items are traced for verification of close out. As and when necessary, the Project Delivery Team will coach and guide the contractor in the delivery of the Project in order to achieve its Vision.

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9.0 Appendices:

Appendix “A”-Rights and Responsibilities of Employees

Appendix “B”: Health and Safety Training

Appendix “C”: Hazard Identification and Evaluation

Appendix “D”: Changes/Modifications to Procedures/Equipment

Appendix “E”: Work Standards, Practices and Procedures

Appendix “F”: Personal Protective Equipment

Appendix “G”: Working in Cold Environments

Appendix “H”: WHMIS

Appendix “I”: Transportation

Appendix “J”: Work Site Hazards (Wildlife Management

Appendix “K”: Workplace Security

Appendix “L”: Nalcor Corporate Safety and Health Standards

Appendix “M”: Electrical Safety

Appendix “N”: Nalcor Corporate Safety and Health Programs

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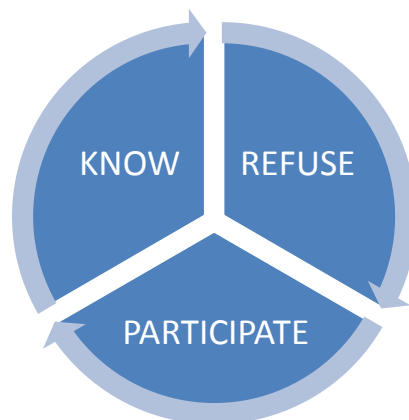
Section 9.0 – Appendix “A”
Rights and Responsibilities of Employees

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Appendix “A”-Rights and Responsibilities of Employees

Each and every employee has certain rights under provincial Occupational Health and Safety law, including:

- Right to Know about the hazards within their workplace - All persons have the right to know of any working condition that may in any way pose a health safety and environmental hazard or risk within the workplace; (e.g. WHMIS).
- Right to Refuse hazardous work - All personnel have the right to refuse work when they have reasonable grounds to believe that the work may be hazardous to them, to their fellow worker and to the facility/vessel.
- Right to Participate in the development, implementation and improvement of environmental health, and safety programs - All persons have the right to participate in identification and management of Health and Safety issues; e.g. JOHS Committee



Right to Know

The Nalcor Energy-Lower Churchill Project, in cooperation with its major contractors, will use a variety of processes to ensure all employees, including contractors, sub-contracted employees and following consultants are informed of any hazards that may be present in the workplace. These programs include the following:

- Employee Training and Orientations
- Occupational Safety & Health Committees/Representatives

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- Group Safety Meetings
- Task Based Job Safety Analyses
- Permit to Work System
- Onsite Emergency Drills
- Signage and Placards
- Safety Alerts and Bulletins

Additionally, applicable Health and Safety documents and relevant legislation including the Contractor Safety Plan will be made readily available to all personnel.

Right to Refuse

As per section (45) of the Newfoundland and Labrador Occupational Health and Safety Act – Chapter O-3 (1992):

1. A worker may refuse to do work that the worker has reasonable grounds to believe is dangerous to his or her health or safety, or the health and safety of another person at the workplace:
 - a. Until remedial action has been taken by the employer to the worker's satisfaction;
 - b. Until the committee or worker health and safety representative has investigated the matter and advised the worker to return to work; or
 - c. Until an officer has investigated the matter and has advised the worker to return to work.
2. Where a worker refuses to do work under subsection (1) his or her employer may reassign the worker to other work that is reasonably equivalent to the work he or she normally performs and the worker shall accept the reassignment until he or she is able to return to work under subsection (1).
3. Where a worker is reassigned to other work under subsection (2) the employer shall pay the worker the same wages or salary and grant him or her same benefits the worker would have received had the worker continued in his or her normal work.

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4. Where a worker has reasonably refused to work under subsection (1) and has not been reassigned to other work under subsection (2) the employer shall pay the worker the same wages or salary and grant the worker the same benefits the worker would have received had the worker continued to work, until he or she is able to return to work under subsection (1).

5. A reassignment of work under subsection (2) is not discriminatory action under section

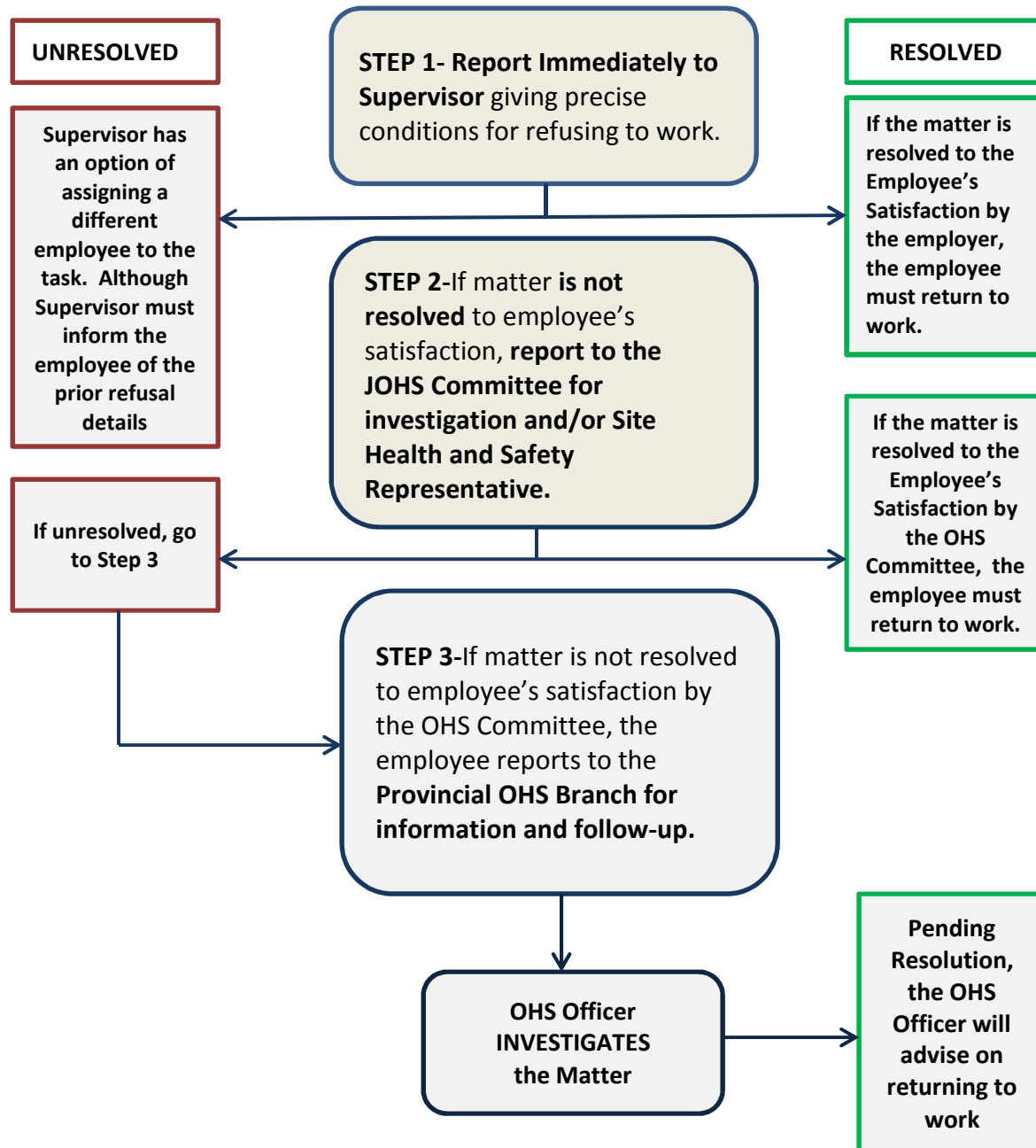
Discriminatory Action Prohibited

Section 49 of the Health and Safety Act of Newfoundland and Labrador states that an employer or union shall not take a discriminatory action against a worker by dismissing him or her or by deducting wages, salary or other benefits, or by taking other disciplinary action against him or her:

- Because of the worker’s participation in or association with the committee, worker health and safety representative or workplace health and safety designate at the workplace, or because the worker is a worker health and safety representative or workplace health and safety designate;
- Because the worker has testified or is about to testify in a proceeding or inquiry under this Act or regulations;
- Because the worker has given information to the Workplace, Health, Safety and Compensation Commission, an officer or another person concerned with the administration of the Act or the regulations concerning the health, safety and welfare of workers at his or her workplace; or
- Because the worker has reasonably refused to work under his or her right to do so.

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Right to Refuse- Three Step Process For Resolution (as per OHS Act):



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Right to Participate (JOHS Committee)

Under PART IV of the OCCUPATIONAL HEALTH AND SAFETY ACT - COMMITTEES, REPRESENTATIVES AND DESIGNATES section (25) of the act identifies the Operations of committees, representatives and designates;

An employer shall ensure that:

- An occupational health and safety committee is established;
- a worker health and safety representative is appointed; or
- a workplace health and safety designate is designated; and
- a copy of the Act/ regulations under the Act are easily accessible.

Minutes of all regular meetings and special committee meetings shall be recorded in the form prescribed by the commission and one copy shall be kept on file with the committee, one copy shall be filed with the commission, one copy shall be posted in a prominent place in the workplace and one copy shall be forwarded to Nalcor Energy-Lower Churchill Project Health and Safety Group.

A worker health and safety representative or a workplace health and safety designate shall report to the commission in the form required by the commission.

An occupational health and safety committee shall:

- Meet within 2 weeks of its establishment;
- Elect co-chairpersons as required by subsection 38(6) of the Act;
- And notify the commission of the elected co-chairs.

Health and Safety (JOHS) Committee

It is the policy of the Nalcor Energy-Lower Churchill Project as well, as a regulatory requirement,` to ensure that all personnel are provided an opportunity to be involved in EHS development and improvement efforts. Formal Health and Safety Committees provide leadership and direction for the company and its business units and allow for participation and input at all levels. The Health and Safety Committee structure is designed to establish positive,

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two-way communication throughout the organization and facility. The organization and function of the Health and Safety Committee shall be designed to meet the intent of applicable Newfoundland and Labrador legislation. The Committee shall:

- Consist of at least equal worker and management representation; Conduct meetings on a regular monthly basis or (every 3 weeks for rotational crews where applicable);
- Prepare Committee meeting minutes and post minutes on the vessel or in onshore office bulletin boards for worker review and submit signed copies of these minutes to the Operator and the regulator; and
- Shall seek to identify aspects of the workplace that may be unhealthy and/or unsafe.

In addition, as required under the Occupational Health and Safety Regulations, the Committee shall

- Be notified and consulted where there is a likelihood that the safety or health of an employee is, or may be, endangered by exposure to a hazardous substance;
- Be informed of all injuries and other “Hazardous Occurrences”; and
- Participate in incident investigations.
- Have the right to accompany an officer of the division when health and safety inspections are being conducted.

NOTE: During the Nalcor Energy-Lower Churchill Project all Safety Committees shall hold meetings on a monthly basis. If there are worker crews who change shift (e.g. every 3 weeks for rotational crews where applicable) each crew will have in place a safety committee.

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Section 9.0 – Appendix “B”

Health and Safety Training

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Appendix “B”: Health and Safety Training

The following Health and Safety Training Opportunities will be provided to Employees, Consultants and Contractors to ensure core competencies are established and maintained.

Health and Safety Induction/Orientation

Prior to mobilization to any of the Lower Churchill Project work sites an Health and Safety Inductions/Orientations will be conducted for all LCP senior management personnel, employees, contractors, subcontractor, visitors and consultants. The Induction/Orientation shall provide an overview of the LCP and Contractor Health and Safety Programs and the Induction/Orientation will include the following:

- Project Overview
- Health and Safety Goals and Objectives
- Health and Safety Responsibilities
- Alcohol and Drug Policy
- Communications
- Training & Competency
- Hazard Identification and Reporting
- Personal Protective Equipment
- Site Specific Safety Policies
- Inspections and Audits
- Incident Reporting and Investigation
- Environmental Protection and Waste Management
- Emergency Preparedness
- Site Security

Informal Communications and Promotion

In addition to the induction and orientation, communication of Health and Safety Performance related information:

- Monthly Health and Safety Performance Updated
- Notices and Bulletins

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- Safety Alerts
- Posters

Personnel Qualifications Competency and Training

The Lower Churchill Project will ensure all project personnel are suitably qualified and trained as per the Contractor's "Training Matrix". The company training matrix will identify the training requirements for each position within the contractor's organization and will comply with Provincial and Federal legislative requirements and guidelines. Internal controls will be established by the Lower Churchill Project to ensure all appropriate personnel comply with the requirements and contractual arrangements and will require all contractors to cooperate in this effort.

Contractor's formal and in-house competency and training programs must consider the level of training required for the position and responsibilities of the personnel involved. The aim of their training programs is to provide an understanding of their procedures, equipment, risks and potential hazards that may occur. Details respecting Contractor's Competency and Training process shall be guided by the following:

- Selection and Control of Contractor Personnel;
- Competence Assessment and Records;
- Training;
- Induction Programs.

Health and Safety Training Matrix

Contractors will maintain independent training matrices which identifies the training requirements for each position in their respective organizations. The training matrix will be maintained up to date to ensure that personnel onshore/offshore have received the required regulatory and job specific training.

Service companies will be required to maintain a training matrix to ensure that all personnel who are working onshore/offshore on vessel are trained and competent in their positions. Training Matrices must be made available on work vessels (as appropriate) and at the worksites onshore/offshore.

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Section 9.0 – Appendix “C”

Hazard Identification and Evaluation

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Appendix "C": Hazard Identification and Evaluation

Job tasks will be reviewed and assessed for hazards/risks and risk management will be applied and utilized to reduce the risk as low as practicable. The following Nalcor risk methods and programs will be utilized on the Lower Churchill Project:

Be Safe Program



BeSafe is a behavior-based safety program designed to develop skills in employees so that they can have respectful safety discussions with others. It is part of Nalcor's second phase of a safety culture initiative aimed at strengthening personal responsibility for safety. It provides a standard conversational structure with which respectful discussions can occur around positive safety behaviours or potentially unsafe behaviors.

It allows employees to: Clearly and respectfully communicate safety concerns or observations, reinforce positive safety behaviours and engage in a collaborative problem solving approach to identify options to overcome potentially unsafe behaviours.

The objectives of the *BeSafe* program are to: understand key components of Nalcor's Safety Culture including Personal Responsibility for Safety, understand what **BeSafe** is and why it is needed and practice **BeSafe** discussions

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BeSafe is a 3-step process that provides guidance on safety conversations.

1. Say Something	B E S	Behaviour is the focus Express your observations Safety is the motivation
2. Discuss Options	A F	Acknowledge the other person’s view Form an agreement
3. Express thanks	E	Express gratitude

Task Based Risk Assessment (TBRA)

The “Task Based Risk Assessment (TBRA)” will provide LCP personnel with guidance and information with respect to the assessment of risk associated with hazards that will be present in the activities of the Lower Churchill Project. A TBRA will be conducted and/or reviewed when the following circumstances apply:

- When a job is being undertaken for the first time and the risks are unknown
- For non-routine jobs or new jobs where experience is limited
- Any job that is intuitively deemed to be a high risk
- IF IN DOUBT- CARRY OUT A JOB SAFETY ASSESSMENT (TBRA)

During the planning and preparation phase, TBRA, including hazard identification and hazard analysis, will be conducted by a multi-discipline team that brings expertise and knowledge in Construction, Drilling, Engineering, Operations and Health and Safety. All contractors involved in Task Based Risk Assessments will follow their own Risk Matrix System if compatible and acceptable to the Lower Churchill and Nalcor Energy corporate “Tasked Based Risk Assessment” procedure. The identification of occupational work hazards will be conducted utilizing but not limited to the following guidelines;

- Hazard Identification
- Specific Hazard Assessment
- Identify Hazard Effect and who may be affected
- Identify Risk Rating
- Identify Controls
- Review Residual Risk After Controls Are Applied
- Document and Record
- Approval to Proceed

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- Permit to Work Systems
- Regular Site Inspections by the Contractor Health and Safety Personnel and
- Audit of compliance and effectiveness to Safety Management Systems periodically assisted or conducted by Lower Churchill Project Health and Safety Personnel.

The need for continual monitoring and identification of hazards both at the operations and management levels is recognized as important by Lower Churchill Project and Contractors. These systems are in place to ensure that all incidents are reported, the causes investigated and any necessary amendments made to operating practices or training of personnel are detailed in the Health and Safety Management Systems.

All Health and Safety risks, including risks associated with change, must be identified and effectively managed. Task Based Risk Assessment identification includes evaluating and prioritizing risks utilizing the Lower Churchill Project Risk (or contracted company) matrix to establish a definitive overall risk characterization and then eliminating or controlling the risks. These systems confirm that there is a two-way flow of communication/ information between all project personnel.

In addition to pre-tour meetings, toolbox/tailgate meetings, work permits, etc., a TBRA gives the crew performing a particular job the opportunity to formally identify the dangers and hazards associated with that job and also what potential injuries and/or damage could result from them. Further, it allows the crew performing that job to clearly communicate what is to be done in order to eliminate or isolate those dangers and hazards so the work can be completed safely. Wherever possible, an alternative means of accomplishing the activity that removes the risk entirely shall be sought.

Inspections and Audits

Lower Churchill Project Inspections and Audits shall be conducted on the contractors to identify potential health and safety issues. The purpose of the inspection and audit process is to:

- Identify and correct actual or potential hazards;
- Ensure continued compliance with regulations and company standards;

The following is a summary of potential inspections/audits for the marine vessels and equipment:

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- Transport Canada Inspections;
- Classifications Survey;
- Nalcor Energy-Lower Churchill Project Inspections and Audits.

A Health and Safety Inspection Checklist is included in Appendix “O”

Behavioral Based Safety Program

A Behavioral Based Safety Program is a tool used to continuously improve safety performance through the identification, observation and reduction of at-risk behaviors and the elimination of incidents. Contractors who have these programs in place will use their programs to enhance overall safety performance in the work place (e.g. STOP, etc.). These programs shall be similar to the Lower Churchill Project and Nalcor Energy Corporate “Safe Workplace Observation Program (SWOP) (see it – fix it – report it)”. This tool is for all employees to use when identifying or observing hazards in the work place. The workers shall immediately correct and/or report potential hazards to their immediate supervisors and shall use the Nalcor Energy-Lower Churchill Project SWOP program or the contractor’s similar booklet to record the hazard observation and actions taken to mitigate such hazards.



The Lower Churchill Project has a goal of becoming a safety leader. One of the key components in achieving “best in class” safety performance is a well developed system for the reporting, review, and analysis of sub standard conditions and practices (acts) as well as loss and “near miss” incidents.

The Safe Workplace Observation Program (SWOP) has been designed with a simple concept in mind: If an individual sees something that does not appear to be safe, if appropriate, they must

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take immediate action to correct it and then report the situation to their Supervisor for follow-up.

By reporting your “Observations” an individual will be helping to ensure that the conditions, practices (acts), or situations that create hazards in the workplace are identified, analyzed, and corrected before a significant loss can occur.

Since it is also important to recognize when something is done well, SWOP also has a commendation component to recognize the importance of celebrating successful safety performance.

Permit to Work (PTW)

Nalcor Energy-Lower Churchill Project takes into consideration that contractors will operate their business aspects at the work site and will require contractors to employ a permit to work system.

A “Permit to Work” system is a formal written system which provides a means of managing non-routine and higher risk tasks and activities. The permit to work procedures provide a method for supervisors and crew members to follow when undertaking certain types of tasks recognized to generate particular exposures to personnel or the site. The PTW system also furnishes management a formal method to administratively coordinate and control work that may adversely impact other concurrent work, impair safety systems or otherwise endanger personnel at the work site. The permit to work also provides a means of formal communications between personnel involved with the permitted job and those personnel that may be affected by it, and supervisors who have influence on how, when and where the work is done. The PTW system shall:

- Limit the scope of the task;
- Ensure supervisors and crew members follow procedures, are well informed, understand and follow the applicable safety precautions and recognize the need for and use of required safety equipment; (E.g. Personal Protective Equipment)
- Control the work within specified time limits;
- Encourage pre-task planning in order to minimize risk to personnel at the work site, and reducing the inconvenience and interference to other operations/activities as well as reduce any adverse impact;

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- Enhance awareness of personnel responsible for overall safety by providing documented details of any known risks, of potentially hazardous activities in progress and appropriate mitigating measures;
- Provide a continuous control and record of ongoing work activities, detailing the nature of the work, required precautions/safeguards, and the responsible competent person in charge, this control and recording will be identified in a detailed “Permit to Work” system/process;
- Ensure that upon completion of work, equipment and site are left in a fully operable state, as well as a tidy and safe condition; and
- Provide formal notification of completion of all work to the Person in Charge (PIC). This notification is a part of a “Permit to Work” system/process.



The issue of a permit to work does not, by itself, make a job safe. A permit to work is not simply permission to carry out a potentially hazardous task, but a critical communications and training tool for all affected personnel. It is part of a clearly defined system which assists in determining how a job can be performed safely; precautions that may need to be taken; specific procedures to safely perform the task; and ways to reduce the risk and hazards related to specific tasks. In accordance with Health and Safety Procedures, the use

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of permits is mandatory for certain operations; these include but are not limited to the following:

- Pressurized systems where there is a possibility of pressure release;
- Any marine vessel work performing over the side work;
- Hot/Cold work;
- Entry into confined space;
- Working on or isolating mechanical, pneumatic or electrical equipment;
- Any diving activities;
- Work involving handling of dangerous materials such as explosives etc.; and
- Heavy lifts.

All new personnel shall receive induction and awareness training on the PTW and contractor JRS where applicable or the Lower Churchill Project TRSA process if required.

Incident Investigation and Reporting

The Lower Churchill Project is committed to providing a safe and healthy workplace for its employees, contractor personnel, subcontractor personnel, vendors and the general public. Safety is our No. 1 priority and it is one of the company's seven core values. Nalcor is committed to **Zero Harm – Nobody Gets Hurt**. We believe this is both achievable and sustainable, while we each have a personal responsibility for safety. The incident management plan must reflect the uniqueness/specifics of the work to be carried out and associated work locations.

Every Accident/Incident is a combination of causes. The Lower Churchill Project through the application of our Health and Safety Management system will endeavor to prevent incidents from occurring. The Lower Churchill Project encourages a culture where accidents/incidents are reported without prejudice. The Lower Churchill Project's Health and Safety Management system will be used to identify and report all accidents/incidents that occur in the workplace. In the event that an accident/incident does occur it will be investigated to the extent required to determine the basic and root cause and to effect appropriate corrective actions.

Accident/Incident investigations will be initiated as promptly as possible. The findings of the investigations will be documented and appropriate recommendation(s) will be developed and communicated to prevent recurrence of similar or other incidents. The appropriate ensuring

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recommendations will be assigned to an individual/position and implemented. All decisions and actions will be communicated.

Any accident/incident that could have resulted in significant injury or property damage (near miss) and all incidents that result in injury or property damage (including spills) will be investigated.

Accidents/Incidents (A/I) Investigations

Accidents and Incidents that must be investigated include the following:

- Fatalities
- Lost Time
- Medical Aid
- Vehicle Accidents/Incidents
- Fires and Explosions
- Chemical and Pollutant Spills
- High Potential Near Miss incident

All employees are required to report any and all accidents/incidents/near miss incidents/spill hazard to their immediate Supervisor immediately. The supervisor will discuss the occurrence with the reporter in order to determine corrective actions. The Supervisor will immediately report the accident/incident/near miss incident/spill hazard to his Manager who will in turn report to the Lower Churchill Project representative on site immediately or within a 24 hour period of being notified of the incident. A final written A/I report shall be forwarded to the Lower Churchill Project representative no later than 14 days after the initial report was made. The A/I report shall identify the basic and root causes, recommendations and responsible person to ensure that recommendations and actions are completed and closed. The Contractors/sub-Contractors shall ensure that mitigations are taken and ensure that such incidents may never re-occur.

Accident/Incident Regulatory Reporting Requirements

Under section 54 of the Newfoundland and Labrador Health and Safety Acts and Regulations requirements:

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1. Where an accident takes place at a workplace:
 - That results in serious injury to a person or results in the death of a person; or
 - That had, or continues to have, the reasonable potential of causing serious injury to or the death of a person

The employer, or principal contractor shall immediately notify the Assistant Deputy Minister of the accident by reporting through the 24 Hour Accident Reporting Line (709) 729-4444.

2. Where an accident is reported under subsection (1), notification shall immediately be given to the committee, the worker health and safety representative or the workplace health and safety designate.

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Section 9.0 – Appendix “D”

Changes and Modifications to Procedures and Equipment

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Appendix “D”: Changes and Modifications to Procedures and Equipment

Modification of Contractors Procedures and or Personnel

Changes and modification applies to changes to programs, procedures, equipment and organizational structure, which may impact the health, safety, environment and financial wellbeing of the project. To better manage and control significant and/or major changes to or within the organization or contracted companies may require a more formal approach to accomplish the desired changes efficiently (e.g. Change Management). Such changes shall be reviewed through the Task Based Risk Assessment process, as any significant and critical changes should be subjected to an analysis, assessment and communication process.

Contractor Equipment Modification

Where significant modification are intended, it is the responsibility of the contractor to ensure that changes process is followed and a formal approval process is initiated for any significant equipment modifications. Depending upon the degree of modification requested a certifying authority’s approval may be required.

Equipment Fitness for Purpose

Any equipment used within the Lower Churchill Project, where applicable, shall have a Certificate of Fitness (CoF) for the area of operations. The contractor shall ensure that equipment complies with any regulatory requirements and industry standards and maintained. For example if a marine vessel is to be used on the Lower Churchill Project it shall meet all Transport Canada classification requirements, either costal trade or ocean going. Any equipment on the vessel that is not under the jurisdiction of Transport Canada may be certified by a certifying company (e.g. DnV). All certificates for vessels/equipment must be made available on the vessel or equipment used onshore must have a current safety inspection certificate and be made available for review.

The Lower Churchill Project will ensure that all Contractor equipment is fit for purpose. Only appropriately certified equipment will be used. If proper certification does not arrive with the equipment, the equipment will not be put into service until such time as verification can be made.

Any additional HS critical equipment requires appropriate certification prior to use (e.g. pressure vessels, materials handling equipment and lifting gear). It is the responsibility of the

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Contractor to ensure that any such additional equipment is fit for purpose and safe to use prior to commencing service.

All lifting equipment (e.g. lifting slings, shackles, pad-eyes, etc.) is visually inspected by a competent person from the contractor prior to use and certified by a qualified 3rd party at least semi-annually. Certification certificates must be at the work site for review by the Lower Churchill Project personnel. A color coding system shall be in place for the purpose of identifying dates for inspection and/or testing. All Kevlar slings must be kept stowed in a secure area of the Tool Room and shall be used for specific uses only and visually inspected prior to each use and again before returning to the Tool Room.

The Lower Churchill Project will foster recognition and agreement from all contractors that reliance on the certification process alone is not sufficient to reduce operational risk of equipment design and construction to “As Low As Reasonably Practicable” (ALARP), and that this requires the personal, active, and visible involvement and participation of all workers and management at all levels.

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Section 9.0 – Appendix “E”

Work Standards, Practices and Procedures

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Appendix "E": Work Standards, Practices and Procedures

The work standards, practices and procedures described in this section are designed to reduce the likelihood of accidents/incidents in the workplace and are consistent with the Lower Churchill Project safety policies and procedures, safety management principles and legislative requirements. This section does not, however, cover all aspects of safety and special circumstances that may arise which will require professional judgment and common sense.

Occupational Health Hazards

The health hazards most commonly encountered in worksite operations include the following:

- **Chemical Hazards** - Hazards resulting from harmful exposure to hazardous chemicals stored, handled or used in the workplace.
- **Illumination Hazards** - Hazards resulting from prolonged exposure to inadequate levels of lighting.
- **Radiation Hazards** - These are hazards resulting from exposure to harmful levels of ionizing and non-ionizing radiation.
- **Biological Hazards** - These are hazards resulting from exposure to living organisms such as viruses, bacteria, fungi and parasites.

Control of Occupational Hazards

The following engineering and administrative controls, safe work practices and personal protective equipment will be used to control exposure to occupational health hazards:

Chemical Hazards

As per the Canadian Federal requirements all worker working in a work place that will be exposed to or working in close proximity to Chemicals and Controlled products will have completed training in Workplace Hazardous Materials Information System (WHMIS), or equivalent training.

Noise Hazards

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Where sound levels in a space exceed 85 dB, the entrance(s) to that space will be fitted with a sign identifying it as a “High Noise Area”. The maximum time exposure of a worker in that space will not exceed the limits prescribed the American Conference of Governmental Industrial Hygienists Threshold Level Booklet. Where it is not reasonable or practicable to maintain the prescribed limits, appropriate hearing protection will be used.

Illumination Hazards

All lighting systems, including emergency lighting, will be properly maintained.

Radiation Hazards

Storage, handling and use of radioactive substances will be licensed by the Canadian Nuclear Safety Commission. The amount of radioactive substances will be kept at a minimum stock necessary to carry out operations, and will be stored away from accommodation areas and passageways in a steel weather-proof container that is properly labeled.

Biological Hazards

Hygiene inspections will be conducted of accommodation areas, including food storage and preparation areas where applicable.

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Section 9.0 – Appendix “F”

Personal Protective Equipment

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Appendix “F”: Personal Protective Equipment

All persons working on the LCP including visitors, will be required to use personal protective equipment (PPE) that is appropriate for the work being performed and the nature of the hazards involved. No person will be permitted to enter an area, or perform any work, where personal protection is required unless that person is correctly attired with the necessary protective clothing or equipment.

All personnel on site will be required to wear standard PPE (i.e, hard hat (with side impact protection), safety boots, high-visibility safety vest, and safety glasses meeting requirements noted below). With respect to the requirements for additional PPE, a risk assessment will be carried out prior to work commencement to determine additional PPE requirements considering site conditions, the nature of the work activity and associated safety risks.

Nalcor Energy requires contractors to ensure that their personnel are instructed in the proper use and care of that equipment.

Cold Temperature Clothing

Clothing must be suitable for the working conditions and must provide protection for low temperatures, high wind velocities and the resulting wind chill factors. The following chart is for determining wind chill factors:

		Air Temperature (Celsius)																
		0	-1	-2	-3	-4	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-55	-60
Wind Speed (km/hr)	6	-2	-3	-4	-5	-7	-8	-14	-19	-25	-31	-37	-42	-48	-54	-60	-65	-71
	8	-3	-4	-5	-6	-7	-9	-14	-20	-26	-32	-38	-44	-50	-56	-61	-67	-73
	10	-3	-5	-6	-7	-8	-9	-15	-21	-27	-33	-39	-45	-51	-57	-63	-69	-75
	15	-4	-6	-7	-8	-9	-11	-17	-23	-29	-35	-41	-48	-54	-60	-66	-72	-78
	20	-5	-7	-8	-9	-10	-12	-18	-24	-30	-37	-43	-49	-56	-62	-68	-75	-81
	25	-6	-7	-8	-10	-11	-12	-19	-25	-32	-38	-44	-51	-57	-64	-70	-77	-83
	30	-6	-8	-9	-10	-12	-13	-20	-26	-33	-39	-46	-52	-59	-65	-72	-78	-85
	35	-7	-8	-10	-11	-12	-14	-20	-27	-33	-40	-47	-53	-60	-66	-73	-80	-86
	40	-7	-9	-10	-11	-13	-14	-21	-27	-34	-41	-48	-54	-61	-68	-74	-81	-88
	45	-8	-9	-10	-12	-13	-15	-21	-28	-35	-42	-48	-55	-62	-69	-75	-82	-89
	50	-8	-10	-11	-12	-14	-15	-22	-29	-35	-42	-49	-56	-63	-69	-76	-83	-90
	55	-8	-10	-11	-13	-14	-15	-22	-29	-36	-43	-50	-57	-63	-70	-77	-84	-91
	60	-9	-10	-12	-13	-14	-16	-23	-30	-36	-43	-50	-57	-64	-71	-78	-85	-92
	65	-9	-10	-12	-13	-15	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	70	-9	-11	-12	-14	-15	-16	-23	-30	-37	-44	-51	-58	-65	-72	-80	-87	-94
	75	-10	-11	-12	-14	-15	-17	-24	-31	-38	-45	-52	-59	-66	-73	-80	-87	-94
80	-10	-11	-13	-14	-15	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95	
85	-10	-11	-13	-14	-16	-17	-24	-31	-39	-46	-53	-60	-67	-74	-81	-89	-96	
90	-10	-12	-13	-15	-16	-17	-25	-32	-39	-46	-53	-61	-68	-75	-82	-89	-96	
95	-10	-12	-13	-15	-16	-18	-25	-32	-39	-47	-54	-61	-68	-75	-83	-90	-97	
100	-11	-12	-14	-15	-16	-18	-25	-32	-40	-47	-54	-61	-69	-76	-83	-90	-98	
105	-11	-12	-14	-15	-17	-18	-25	-33	-40	-47	-55	-62	-69	-76	-84	-91	-98	
110	-11	-12	-14	-15	-17	-18	-26	-33	-40	-48	-55	-62	-70	-77	-84	-91	-99	
		0 to -10 Low			-10 to -25 Moderate			-25 to -45 Cold			-45 to -59 Extreme			-60 Plus very Extreme				

High Visibility Vests, Coats, Shirts, Jackets on the work site must be compliant with the most current CSA Z96.1 standard.

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All personnel working near “energized” electrical equipment or transmissions lines shall wear Fire Retardant Coveralls (Nomex or equivalent). All coveralls must be equipped with high visibility materials/reflective stripping as per the latest CSA Z-96.1 standard.

When construction site personnel are exposed to the hazard of moving vehicles or heavy equipment, they shall wear distinguishing apparel containing highly visible material suitable for daytime or night time use. Work Vests, Coveralls or Jackets must be equipped high visibility, reflective striping as per CSA Standard- Z 96.1, “Guideline on the Selection, Care and use of High-Visibility Safety Apparel (HVSA).”

Protective Headwear

Protective hard hats are designed to protect the wearers’ head from impact (including side impact) and penetration of falling objects. All personnel will ensure that their industrial protective headwear meets the design standards set out in CSA Standard CAN/CSA Z94.1-92 will be worn when outside offices and other exempt areas. Hardhat liners or other apparel suitable to protect the neck and head from cold injury must be worn with the hardhat in extreme cold. All hard hats must be provided with side impact protection.

Protective Footwear

Protective footwear that meets the design standards set out in CSA Standard CAN/CSA Z195-02 (Green Triangle) will be worn when outside offices and other exempt areas. Safety boots must have Grade 1 Toe Protection. Those personnel working in and around electrical power generation and transmission links must wear electrically resistive safety boots (Orange Omega Symbol) In terrain conditions where there is a risk of ankle injury or falls, footwear with ankle support (between 6 and 8 inches boot height) and aggressive treads must be worn on the site.

Eye and Face Protection

Eye and face protective equipment that meets the design standards set out in CSA Standard CAN/CSA Z94.3.1 will be worn where there is a potential for an injury to the eyes, face, ears or front of the neck. Industrial safety glasses with permanent side shields will be worn when outside offices and other exempt areas. Plastic Lenses must be treated to block UV rays. Safety glasses must have non-conductive frames. CSA approved safety eyewear is required at all times on work sites, except in vehicles and camp facilities.

The minimum standard for eye protection is CSA approved safety glasses with fixed side shields. Full-face shields, mono goggles or other types of eye protection must be worn when safety glasses are not adequate to protect from impacts (i.e. grinding, abrasive blasting etc.).

Contact lenses should not be worn in areas where dust is common or strong chemicals are used. Where there is a potential for chemical or particulate exposure to the eyes, ensure an appropriate portable eye-wash system, capable of delivering approximately 0.4 gallons per minute for at least 15 minutes, is readily available. Safety goggles face shields or glasses with

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side shields are also required to be worn to protect from splashes or particle projectiles. Contact lenses should always be removed to adequately flush foreign substances from the eyes. Prescription vision correcting eyeglasses must be CSA approved safety glasses with rigid side shields or worn under approved safety glasses.

Hearing Protection

Hearing protection that meet the design standards set out in CSA Standard Z94.2-02 will be used where sound levels exceed 85 decibel. CSA Standard Z94.2 94 hearing protectors such as earmuffs or earplugs will be available and worn in high noise areas (above 85 dB (A) or whenever there is a risk of hearing impairment. Workers should be made aware of their reduced ability to hear warnings and noises when wearing ear protection.

A contractor whose workers will be exposed to noise levels at or in excess of 85 dB(A) must have a noise management plan. The plan will address how workers will be monitored and protected from excess noises.

Hand Protection

Gloves suited for the work will be worn to protect against cuts, burns, electricity, chemicals and exposure (heat or cold) to the elements. In most cases, cotton work gloves suitable for visitors/inspectors to the work site. For material and equipment handling tasks, leather palmed gloves must be worn to provide adequate hand protection. For handling chemicals or hydrocarbon products, chemical resistant gloves must be worn. For any question regarding types of gloves for a particular task, the supervisor or safety representative should be contacted.

Skin Protection

An apron, full-face shield and rubber gauntlet-style gloves will be provided to every person required to handle caustic soda, acids or other corrosive products. Barrier creams or lotions will be provided to workers who may experience a rash on their skin from chemical irritants.

Fall Protection

Every person who works from an unguarded structure that is more than 2.4 m above the nearest permanent safe level, or is above an open pit, hopper, moving machinery parts or water, will use fall protection equipment that meets the design standards set out in CSA Standards Z259.2.1-98 (CAN/CSA-Z259.10-06 - Full Body Harnesses). Fall protection systems may include barricades, guard rails, work platforms and scaffolding. Contractors must use fall protection to protect themselves from falling. In addition, personal fall restraint and arrest systems will be used where necessary.

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- Ensure that systems are designed and constructed as per regulatory requirements.
- Ensure temporary structures are inspected prior to use, regularly during use and when transferred.
- Ensure all fall arrest systems, devices and procedures comply with regulatory requirements.
- Ensure workers who will use fall protection systems are competent and adequately trained in fall protection systems (i.e. hazards, use, limitations, inspections etc.). The Newfoundland OHS Regulations require that all workers required to utilize fall protection equipment must complete a training program on fall protection as prescribed by the WHSCC.
- Ensure workers have reviewed the fall protection rescue plan and signed off to ensure they understand it.
- Fall restraint systems must be used when working above, over moving machinery or over water where, due to temperature or depth, or current movement, self-rescue is difficult or impossible.
- Ensure lifelines optimize connection points for workers’ personal fall-arrest devices.
- Ensure workers connect lanyards so that the maximum free fall is restricted to 1.2m or otherwise prescribed in current regulatory requirements. Position personnel to prevent pendulum swing falls
- Part of the harness system is a shock absorbing lanyard with locking snaps. Ensure the shock-absorber end is always connected to the safety harness. It is recommended that a full body harness with two shock absorbing lanyards attached to the back “D” ring is worn. NOTE: Fall arrest systems may have various applications during the course of the project and their configurations could be different from what is recommended above. Any deviations to the system noted above should be approved by the LCP Muskrat Falls Health and Safety Manager or LCP Muskrat Falls Health and Safety Coordinator.
- Ensure anchoring points meet the health and safety requirements
- A subcontractor whose workers are exposed to the risk of falling must have a fall protection plan for the work. The plan must assess the fall hazards, fall protection and maintenance of fall protection equipment and the plan must be communicated with all workers at the job site.

Drowning Protection

All personnel working near or over the water are required to wear a personal flotation device meeting CAN/CGSB – 65-CCP-14M. Additionally, all personnel who work over-the-side of a marine vessel or in an area where there is a danger of falling overboard will be required to use a life jacket or personal floatation device that meets the design standards set by the Canadian General Standards Board and the Canadian Shipping Act and Regulations. The floatation device must meet the CGSB Standard CAN/CGSB 65.11-M88 or equivalent.

Respiratory Protection

In areas or spaces where there is a hazard of an airborne hazardous substance or an oxygen deficient atmosphere, respiratory protection equipment that is listed in the NIOSH Certified Equipment List will be required. Training will be provided specific to the equipment to be used

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prior to actual usage. Respiratory Protection must be CSA approved and meet the requirements of CSA Z94.4. (Selection, Use and Care of Respirators)

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Working in Cold Environments

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Appendix "G": Working in Cold Environments

The ability of workers to function and work normally in cold environments is affected by the degree and extent of exposure to sub-zero conditions. Additional precautions must be considered with regard to using lifting equipment in extreme cold temperatures.

Contractors must be adequately prepared to ensure personnel are not put at risk due to exposure to cold conditions. The following standards must be followed when personnel are required to work in cold conditions. The changes to human performance under such conditions are due to two main factors:

1. The environmental temperature
2. The clothing required to maintain a safe core body temperature and to fully function in the environment in the execution of an assigned task.

Cold Safe Work Standards

Rest breaks must be planned for and utilized to allow workers to warm up particularly their extremities. These breaks should not be less than 10 minutes in length and should be taken in a heated area. Outer clothing should be removed to prevent overheating and sweating when in the heated area. Returning to cold work while damp or sweaty may result in rapid chilling. The following recommended work practices should be followed:

Under conditions of continuous work in the cold:

- Heated warming shelters (i.e. bus, vehicles) should be provided. Workers should be encouraged to use these at regular intervals, the frequency of use depending on the severity of environmental exposure.
- When entering the heated shelter, outer and middle clothing layers (as necessary) should be removed to prevent overheating and to permit dampness to evaporate. A change of dry clothing may be necessary.
- Warm fluids should be consumed at the work site to provide energy, warmth, and replace fluids lost during work. Significant fluid loss can occur in the cold due to sensible and insensible sweating, breathing, and the extra energy requirements of working in the cold. Dehydration in the cold is a serious concern, increasing a worker's susceptibility to hypothermia.
- The onset of severe shivering, the feeling of excessive fatigue, drowsiness, irritability or euphoria are indications for immediate return to the shelter.

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Warm up Schedule for Cold Temperatures

AIR TEMPERATURE SUNNY SKY		NO NOTICEABLE WIND		8 KPH WIND		16 KPH WIND		24 KPH WIND		32 KPH WIND	
°C	°F	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks
-26° to -28°	-15° to -19°	Normal work hours and break periods	1	Normal work hours and break periods	1	75 min.	2	55 min.	3	40 min.	4
-29° to -31°	-20° to -24°	Normal work hours and break periods	1	75 min.	2	55 min.	3	40 min.	4	30 min.	5
-32° to -34°	-25° to -29°	75 min.	2	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease	
-35° to -37°	-30° to -34°	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease			
-38° to -39°	-35° to -39°	40 min.	4	30 min.	5	Non-emergency work should cease					
-40° to -42°	-40° to -44°	30 min.	5	Non-emergency work should cease							
-43° & below	-45° & below	Non-emergency work should cease									

Source: American Conference of Governmental Industrial Hygienists, Inc. (ACIGH) 1999.

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Notes:

1. *The schedule applies to any 4-hour work period with moderate to heavy work activity, with warm-up periods of 10 minutes in a warm location, and with an extended break (e.g. lunch) at the end of the 4-hour work period in a warm location. For Light-to-Moderate Work (limited physical movement): apply the schedule one step lower. For example, at -35oC with no noticeable wind, a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period because they generate less body heat when they are less active and therefore, will get colder sooner.*
2. *The following is suggested as a guide for estimating winds velocity if accurate information is not available: 8 kph: light flag moves; 16 kph: light flag fully extended; 24 kph: raises newspaper sheet; 32 kph: blowing and drifting snow.*
3. *If only the wind chill cooling rate is available, a rough rule of thumb for applying it rather than the temperature and wind velocity factors given above would be*
 - a) *special warm-up breaks should be initiated at a wind chill of about 1750 W/m2, and*
 - b) *all non-emergency work should cease at or before a wind chill of 2250 W/m2. Wind chill cooling rate is defined as heat loss from a body expressed in watts per meter squared which is a function of the air temperature and wind velocity upon the exposed body.*

In general, the warm-up schedule provided above slightly under-compensates for the wind at the warmer temperatures, assuming acclimatization and clothing are appropriate for winter work. On the other hand, the chart slightly over-compensates for the actual temperatures in the colder range because windy conditions rarely prevail at extremely low temperatures.

The following table presents a minimum recommended schedule of maximum cold weather work periods that must be followed by a rest period. The table takes into account the combination of wind and temperature, and applies to moderate to heavy work activity. The notes on the page after the table explain how to adjust its recommendations for lighter work activity.

Threshold Limit Values for Work and Warm-up Schedule for 4 Hour Shift

These TLV’s apply only for workers in dry clothing.

Special Precautions

Exposure to vibration may increase a worker’s susceptibility to cold injury because of the way that vibration can reduce circulation, particularly in the extremities.

Work performed in snow or ice-covered terrain may require tinted safety eyewear with side shields for protection from glare.

Workers with health conditions that affect normal body temperature regulation or impair

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circulation e.g. Raynaud's syndrome, diabetes, thrombophlebitis, etc. should take appropriate precautions when working in the cold.

Body parts that have sustained a frostbite injury are sensitive to re-injury. Workers should be aware of this and limit opportunities for re-injury.

If loose or bulky clothing is worn, special care should be taken when working around moving equipment or machinery to prevent clothing entrapment.

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Section 9.0 – Appendix “H”

WHMIS (Workplace Hazardous Materials Information System)

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Appendix “H”: WHMIS (Workplace Hazardous Materials Information System)

The Workplace Hazardous Materials Information System (WHMIS) is a Canada-wide Hazard Communication System that deals with the most basic aspects of health and safety at worksites where chemicals are handled. It is fundamental “right to know” legislation. It enables anyone at a worksite to become knowledgeable about the hazards of the chemicals they handle or are potentially exposed to. Information about hazardous materials or “controlled products” will be provided in two forms:

- Labels or placards on the product containers, and
- Material Safety Data Sheets (MSDS).

Suppliers of controlled hazardous products and employers are both responsible for providing information of the controlled hazardous products and material.

Roles/Responsibilities

Supplier Responsibilities

- Appropriate labeling hazardous materials supplied to the workplace, and
- Preparation of the applicable MSDS.

Employer Responsibilities

- Must make the information available to all workers and ensure that a hazardous substance inventory is maintained for the regulated hazardous materials encountered on the worksite.
- Employers must have a corresponding current MSDS located for easy access by all employees. MSDS expire after three years and must therefore be renewed at the three year point or, the manufacturer can supply written confirmation that since no changes to the product/MSDS have occurred, the life of the existing MSDS is extended by attachment of the written notice.
- Employers must ensure all personnel that would potentially handle or be exposed to controlled products receive adequate training in Workplace Hazardous Materials Information System (WHMIS) and this training is current.

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Worker Responsibilities









- Hazardous products are labeled with supplier labels and/or appropriate worksite labels or other required identification;
- Comply with corresponding current MSDS requirements; and
- Are handled and stored in accordance with Company and legislated requirements.

Labels

- All products shall meet the following label requirements:
- Controlled products, chemicals and other hazardous materials, which have been brought to the workplace, must have a “Supplier Label” attached. If no label is attached or exists, the product should not be accepted, and returned with the carrier;
- The supplier label identifies the product and provides basic hazard information and hazard prevention measures;
- Symbols and written material are used on the labels so that you can immediately recognize the associated hazards;
- Controlled products manufactured at the worksite are to be labeled with “Worksite Labels or placards”. These include controlled products from outside whose original supplier labels may have been damaged, bulk containers of controlled products, and products that have been decanted;
- The worksite label identifies the product and includes basic information on its safe use, handling, storage, and disposal and refers the user to the Materials Safety Data Sheet (MSDS);
- The Hazard Symbol Chart below describe all symbols and classifications to help you prepare a worksite label; and
- For information on the symbols that do or do not apply, consult the respective MSDS. Only those symbols that do apply should be identified on the worksite label.

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WHMIS Hazard Symbols

Symbol	Description
	A: Compressed Gas (Oxygen, acetylene, Propane, aerosol spray cans, etc.)
	Class B: Flammable and Combustible Materials
	Class C - Oxidizing Materials that can emit Oxygen and thereby help other materials burn
 <u>Class D: Poisonous and Infectious Materials</u>	
	D1 - Materials causing immediate and serious toxic effects
	D2 - Materials causing other toxic effects that cause long-term eye/skin irritations
	D3 - Bio-hazardous infectious materials (Live bacteria or viruses)
	Class E - Corrosive materials that cause burns through the skin or eyes, or by inhalation
	Class F - Dangerously reactive materials that can burn or explode if exposed to excessive heat, shock, or mixed with other chemical products.

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Material Safety Data Sheets

MSDS provide detailed information on controlled products. MSDS must be made available at the field office/worksites for all controlled products that you will come in contact with. If you find that a MSDS is not available, contact your supplier immediately; they are responsible for providing you with a current MSDS for the product. WHMIS requires a current MSDS to be supplied by the manufacturer of the product. MSDS have a shelf life of three years.

The nine essential sections of a MSDS are as follows:

1. Product Identification and Use: This includes the manufacturer and supplier's name, address and telephone number, the product identifier, and product use. A distributor buying a controlled product for resale does not have its own identification on the MSDS.
2. Hazardous Ingredients: This provides a list of chemical identifications of all controlled products and their concentrations. Where a concentration is expressed as a percentage, it is generally by weight.
3. Physical Data: This includes the physical properties of the controlled product such as odor, density, boiling point, melting point, etc.
4. Fire or Explosion Hazard: This provides information such as the flammability limit, upper and lower explosive limits, and means of extinction.
5. Reactivity Data: This includes the conditions under which the material is unstable, the names of the substances that the product is incompatible with, and the hazardous decomposition products.
6. Toxicological Properties: This provides information on the possible health effects of the product from acute or chronic exposure, exposure limits, and names of toxicologically synergistic products.
7. Preventive Measures: This provides the required personal protective equipment (PPE), specific engineering controls, emergency procedures, waste disposal, and storage and shipping requirements.
8. First Aid Measures: This includes specific first aid measures for workers.
9. Preparation Information: This provides the name and telephone number of the group preparing the MSDS and the date of preparation.

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Waste Management

For the identification, classification, handling and disposal of waste potentially generated during the Lower Churchill Project, please refer to the LCP Waste Management Plan which is part of the overall LCP Environmental Management Plan.

Transportation of Dangerous Goods (TDG)

Dangerous goods include potentially hazardous materials such as explosives, compressed and liquefied gases, flammable liquids and solids, oxidizing materials, and other substances that are poisonous, infectious, radioactive or corrosive. The Transportation of Dangerous Goods Act (TDG) exists to protect people, the environment, or property when goods are being transported by road, rail, sea or air. Shippers, carriers and receivers are all responsible for ensuring that shipments of dangerous goods comply with federal, territorial, provincial and municipal laws. Payments of any fines assessed are the responsibility of those failing to comply.

Responsibilities of the Consignor

The consignor (the shipper) must ensure that in accordance with TDG Regulations the goods are:

- Classified
- Packaged
- Marked
- Labeled
- Documented
- The consignor must provide to the carriers a copy of the shipping document and placards, if necessary. Consignors must also report any dangerous occurrences in accordance with the regulations.

Responsibilities of the Carrier

Carriers must follow all applicable TDG and other legal requirements. They are responsible for:

- Checking the shipment before accepting it;
- Checking the documentation for accuracy;
- Mounting placards;

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- Maintaining or replacing safety marks, labels, and placards, if necessary;
- Ensuring that the driver has in their possession a current TDG certificate;
- Ensuring proper shipping documents as outlined in the regulations are in the vehicle including MSDSs;
- Delivering shipping documents as outlined in the regulations; and
- Reporting any dangerous occurrences that happen during transport.
- Transport vehicle has provisions for containing and cleaning any minor spills that may occur and the driver has been trained to carry out the task as required

Note: TDG Certificates are required to be renewed every three (3) years.

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Transportation of Dangerous Goods Classifications

Class 1: Explosives

 <p>1.1 Major Explosion</p>	 <p>1.2 Major Projection</p>	 <p>1.3 Major Fire</p>
 <p>1.4 Localized Explosion</p>	 <p>1.5 Insensitive Mass Explosion</p>	 <p>1.6 Extremely Insensitive</p>

Class 2: Gases

 <p>2.1 Flammable Gas</p>	 <p>2.2 Non-Flammable, Non-Toxic Gas</p>	 <p>2.3 Toxic Gas</p>	 <p>Oxidizing Gas</p>
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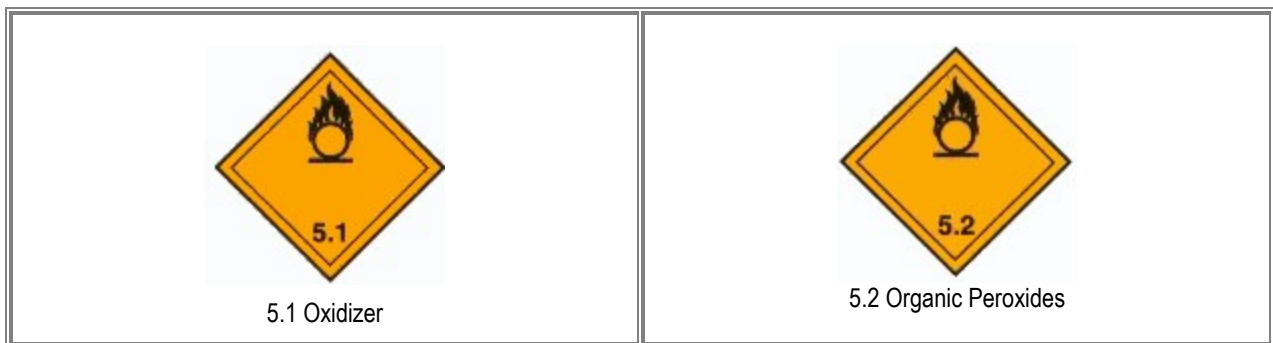


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Class 4: Flammable Substances



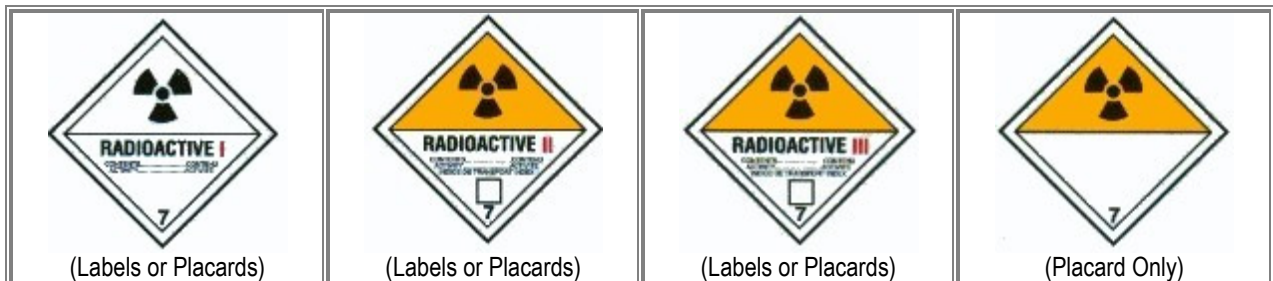
Class 5: Oxidizers / Organic Peroxides



Class 6: Toxic / Infectious Substances



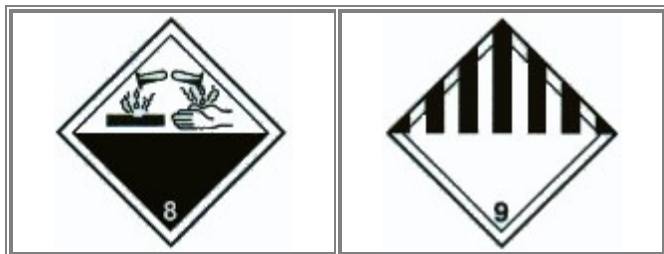
Class 7: Radioactive



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Class 8: Corrosives Class 9: Miscellaneous



UN Number, Packing Groups, Mixed Load

<p>UN Number (Label)</p>	<p>UN Number (Placard)</p>
<p>Packing Groups</p> <ul style="list-style-type: none"> I Great Danger II Moderate Danger III Minor Danger 	<p>Mixed Load (Placard)</p>

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Transportation

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Appendix "I": Transportation

Aircraft Safety – Helicopters/Fixed Wing Aircraft

During the course of the Lower Churchill Project, workers may be required to use helicopters to access remote areas to undertake fieldwork or use charter fixed wing aircraft to access areas when commercially scheduled flights are not available. During new hire orientation sessions, aircraft safety requires discussion by a competent individual. All personnel that are required to fly are aware of safety practices/procedures. The following will serve to acquaint workers with the general procedures governing passenger conduct working in and around helicopters and fixed wing aircraft.

Pre-Flight Information

- Prior to boarding the aircraft, all passengers will participate in the safety orientation conducted by the pilot will conduct. A safety orientation will be conducted whenever a new passenger joins the flight or the aircraft type changes.
- Pilot will provide instructions on operating latches, stowage of gear and prohibited items, location of emergency equipment and survival equipment in that model of aircraft as well as how and when to approach or disembark the aircraft.
- Pilot will identify the location of the survival kit. Confirm the kit is adequate to support the number of people in the aircraft.
- Pilot will advise the emergency landing posture for the aircraft type that is to be used that day.
- All passengers will advise the pilot it is their first flying experience or if they have any personal concerns.
- All passengers must dress accordingly; consider the environment and the weather conditions that might be encountered.
- Advise the pilot of the equipment and hazardous goods that you are going to bring on the aircraft.
- Carry, on your person, a reserve of any special medication you require, as delays may occur.

Embarking and Disembarking – General Aircraft

- Passengers shall approach, board or leave the aircraft only when directed to do so by the pilot or qualified ground crew member.

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- Passengers shall obey all instructions given by the pilot.
- Use hearing protection devices provided.
- Conversation with the pilot should be restricted during the take-off and landing phases of the flight, as should intercom discussions among passengers.
- Smoking is prohibited within 10 meters of the landing pad, aircraft maneuvering or parking areas.

Embarking and Disembarking – Helicopter

- It is preferred that the helicopter be shut down for loading and unloading passengers; in the event this is not possible, passengers shall approach, board or leave a helicopter only when signaled to do so by the pilot.
- Eye protection will be worn while boarding and leaving a helicopter that is not shutdown.
- Passengers shall approach and leave the helicopter within the pilot's field of view and walk in a crouched position while under the main rotor.
- Passengers shall only approach a helicopter, in uneven terrain, by moving up-slope or disembark by moving down-slope.
- Passengers shall not walk behind the rear doors of the helicopter cabin.
- Passengers shall not carry any objects to or from the helicopter above shoulder height.
- Hardhats, baseball caps or other headgear shall be carried to and from the helicopter or be equipped with chin straps for use near helicopters.
- Passengers will leave the helicopter and move away during refueling.
- During arrival and departure of helicopters, stay off the landing pad to avoid exposure to flying particles and secure all equipment within the down wash zone of the landing pad.

Vessel Operations

LCP, Contractor and subcontractor workers may be involved in boat operations during the course of the Lower Churchill Project. All workers shall wear a Canadian Coast Guard approved personal floatation device when traveling by boat and when working over water where there are no handrails or lifelines. Specific site conditions will be assessed for hazards using the appropriate risk assessment tool (JSA, LMRA etc.) and additional procedures be developed and implemented as needed.

Before boarding any sea going vessel, personnel working on the vessel must be trained in:

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- Survival at sea
- Aircraft rescue at sea
- Cold weather and arctic survival

General Vehicle Safety

It is imperative for workers to exercise a high level of safety responsibility when operating a vehicle either on or off the highway or on any of the sites of the Lower Churchill Project.

All drivers will:

- Possess a valid driver's license.
- Drive at or below posted speed limits.
- Use a vehicle suitable for the conditions expected.
- Will make them-selves familiar with the vehicle jacking tools, emergency equipment and ensure the vehicle has a serviceable spare tire.
- Prior to getting into a vehicle, walk around the vehicle to check for obstacles or hazards.
- Wear a seat belt at all times when the vehicle is in motion. When travelling on frozen lakes or rivers the use of seat belts is not mandatory. Vehicle speed must be appropriate for the ice conditions.
- Be responsible for passenger safety. All passengers shall wear seat belts at all times when the vehicle is in motion and it is the responsibility of the driver to ensure such.
- Drivers may acknowledge an in-coming call on a two-way radio and will immediately park in a safe location to continue the conversation. Drivers must park in a safe location to retrieve messages or initiate calls.
- Conduct a "Walk Around" Vehicle inspection prior to operating the vehicle each day.
- Comply with traffic laws when operating the vehicle.
- Obey all flag persons, posted signs and warnings when driving on public roads, private roads, property, sites or plants.
- Weather conditions permitting, turn off the engine and set the parking brake when the vehicle is left unattended.
- Turn off the engine when fuelling the vehicle. Check the oil level each time the vehicle is refueled.
- Report any incident involving the vehicle and/or injury immediately or as soon as reasonably possible to a Supervisor.

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All-Terrain Vehicles and Snowmobiles

All-Terrain Vehicles have been increasingly used to undertake work in terrain where regular vehicles cannot operate. All ATV and snowmobile operators shall:

- Have a valid operator's license.
- Be competent in operating an ATV or snowmobile.
- Prior to using an ATV or snowmobile, walk around the unit and check for obstacles or hazards.
- Operate the ATV and snowmobile according to provincial or territorial regulations.
- Operate and maintain the ATV or snowmobile according to manufacturer recommendations.
- Wear the protective equipment specified in the provincial or territorial regulations and by the manufacturer.
- Inspect the ATV or snowmobile before each use.
- Use ramps to load and unload the ATV and snowmobiles from vehicles or trailers.

Heavy Equipment Hazard Zone

Workers must remain aware of the hazard zone that exists around heavy equipment:

- The work area (including turning radius) surrounding hoes, cranes and drills will be marked with barricade tape.
- Unauthorized workers will remain outside of the marked hazard zone.
- To ensure safety of personnel when loading and unloading materials or products from heavy equipment, "wheel chocks" must be used and the area flagged off.

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Section 9.0 – Appendix “J”

Work Site Hazards (Wildlife Management)

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Appendix “J”: Work Site Hazards (Wildlife Management)

We live in harmony with most wildlife in Newfoundland and Labrador, often without even realizing it. Our forests and barrens are home to many animals. Unless we intentionally seek them out, some people can go a lifetime without being aware of their presence. As long as humans and wildlife respect each other’s’ boundaries, conflicts can be avoided – but we all have to do our part to make sure we don’t encourage behavior that could cause problems for wildlife, such as Coyotes and Black Bears.

Identifying Coyotes

The Eastern Coyote belongs to the Canidae family, which also includes wolf, fox and dog. Like most animals, coyotes usually have a natural fear of people, but they also possess natural intelligence and can quickly get used to life in residential areas as long as they have easy access to food. Although attacks on humans are extremely rare, they can occur if a coyote becomes too comfortable around people and starts associating humans with food.

If a coyote enters your work site/area you should never approach a coyote, if a coyote approaches you take the following steps:

- Give it an escape route.
- Throw rocks, sticks or other objects at the coyote.
- If the coyote continues to approach, back away slowly and move toward buildings or human activity.
- Do not turn away or run. This will encourage the coyote to chase you.

Identifying Black Bears

Black Bears are bulky animal with a moderate-sized head; a tapered, brownish muzzle and long nostrils; rounded ears; small eyes; and a short tail. Coat is usually black, sometimes with a white patch on the throat or chest. Feet are furry with five curved, non-retractable claws. Similar to the coyote, black bears usually have a natural fear of people, but they can quickly get used to life in residential areas as long as they have easy access to food. Although attacks on humans are extremely rare, they can occur if a black bear becomes too comfortable around people and starts associating humans with food.

Little can be done to manage habituated bears. Avoid creating problem bears by making sure food, trash and other attractants are stored properly. Although black bears are usually timid and attacks are extremely rare, they are wild animals and can be dangerous.

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If a black bear enters your work site/area takes the following steps;

- Stay calm.
- Use “Bear Bangers” or similar noise makers
- Give the bear space and an escape route.
- Speak calmly and firmly, avoid eye contact, and back away slowly
- Never run or try to climb a tree.
- If the bear begins to follow you, drop something (not food) to distract it.
- Be cautious around females with cubs.
- If the bear attacks you, fight back and make a lot of noise. Do not "play dead."

Polar Bears

Although Polar bear encounters in Newfoundland and Labrador are rare, they have been sited in both areas over the last few years. Polar bears are among the largest carnivores in the world. They are strong, fast and agile on ice, land, as well as in water. The best way to be safe is to avoid them completely at all times.

Polar Bear live mainly on sea ice or on land within a few kilometers of the coast. In summer, polar bears often travel along coastlines using points of land and rocky islets near the coast to navigate. They also travel inland and have been seen as far as 150 kilometers from the coast.

To best avoid encounters with all bears, it is always important to stay alert. It is recommended that in remote areas to always travel in groups of at least four people and stay together to increase safety. Creating noise while walking through remote areas will communicate your presence. It is important travel in daylight and be aware of your surroundings. Polar bears may be hard to see. Avoid areas of restricted visibility, pushed up sea ice, boulders, driftwood or vegetation. Watch for tracks, droppings and diggings.

Never approach a bear. Polar bears defend their space and may consider you a threat. Never feed bears or other wildlife. A bear that associates humans with food is dangerous. Never approach a wildlife carcass. A bear may be in the area. Leave immediately.

It is possible to have an encounter with a polar bear by chance or because it is attracted to your activity. Polar bears are curious and may investigate any strange object, smell or noise. Always stay calm and assess the situation. Each encounter with a polar bear and bears generally is unique. Good judgment, common sense and familiarity with bear behaviour are important.

- Curious Bears - If a bear knows you are there and shows signs of being curious such as moving slowly with frequent stops, standing on hind legs and sniffing the air, holding its

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head high with ears forward or to the side, moving its head from side to side, or trying to catch your scent by circling downwind and approaching from behind, do not run. Back away slowly. Help the bear identify you as human by talking in low tones. Move slowly upwind of the bear so that it can get your scent. Always leave an escape route for the bear. Do not run.

- **Defensive Bears** - If a bear has been surprised at close range or shows signs of being agitated or threatened such as huffing, panting, hissing, growling, jaw-snapping, stomping its feet, staring directly at a person, or lowering its head with ears laid back, do not run. Back away slowly. Do not shout or make sudden movements. Avoid direct eye contact. Act non-threatening. Be prepared to use deterrents. Do not run.
- **Predatory Bears** - If a bear shows signs of stalking or hunting you such as following or circling you, approaching directly, intently and unafraid, returning after being scared away, or appears wounded, old or thin, do not run. Group together and make loud noises. Be prepared to use deterrents. Be prepared to fight back. Do not run.
- **Bears With Cubs** - Never get between a bear and her cubs. If you come across a bear with cubs, do not run. Group together and leave the area immediately. Be prepared to fight back if she attacks.

If you experience a polar bear attack use any available weapon such as rocks, blocks of ice, knives, skis or poles.

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Section 9.0 – Appendix “K”

Workplace Security

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Appendix “K”: Workplace Security

To address instances where security could be compromised (unauthorized access) at the construction site security practices must be properly implemented. Access to and from construction site locations will be restricted to authorized personnel only and that have a proper site orientation. Temporary vehicle gates will be installed at entrance points to the construction site location and controlled by security personnel.

The following security measures and precautions will be taken during the course of the project:

- The Site Security Provider will be responsible for placement of the security workers during and after work hours as and when warranted.
- All authorized visitors must sign in and out. All visitors must meet training requirements.
- Control of equipment and materials entering and leaving the site will be strictly monitored.
- Any hazardous wildlife sightings, security issues and incidents must be reported immediately to the designated LCP Site Environmental Advisor designated representative.

Any illegal conduct by personnel on the construction site is grounds for immediate removal and subject to be turned over to local RCMP.

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Section 9.0 – Appendix “L”

Nalcor Corporate Safety and Health Standards

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Appendix “L”: Nalcor Corporate Safety and Health Standards

The following is the most current list of Nalcor Corporate Safety and Health Standards:*

- 4.4.3.2.2 **Internal Safety and Health Communications**
- 4.4.6 **Electronic Device Use Standard**
- 4.4.6.1 **Contractor Safety Management**
- 4.4.6.1.1 **Energized Power Line Hazards Permits**
- 4.4.6.1.2 **Work Methods**
- 4.4.6.2 **Confined Space**
- 4.4.6.3 **Electrical Safety Program**
- 4.4.6.3.1 **New Worker Hard Hat Program**
- 4.5.1.1 **Data Trending and Analysis**
- 4.5.3.1 **Incident Investigation and Reporting**

* *A number of the Corporate Health and Safety Standards are undergoing approval process at the current time.*

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Section 9.0 – Appendix “M”

Electrical Safety

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Appendix "M": Electrical Safety

General:

Only a worker qualified to work on electrical conductors and equipment shall be authorized to do the work. (OH&S Regulations, Section 478 (2))

Approved live line techniques as determined through a formal risk assessment shall be utilized when performing such work. OH&S Regulations 478 (3)

The supervisor shall appraise the work and decide whether it can be done safely. If in doubt, he/she shall refer the job to the next level of supervision.

No other work shall be done on a pole or structure upon which live line work is in progress. This rule also applies to the pole or structure on either side of the pole being "worked on".

If possible, work on energized lines or apparatus should be done from below.

When it is necessary for one worker to change his/her working position on a pole or tower, other workers shall not do any work on energized conductors until the worker changing position has reached his/her new position.

Workers doing live work shall devote their undivided attention to the work at hand. Unnecessary conversation shall be avoided.

Neutral wires carried horizontally on the side of the pole below energized conductors shall be removed from the pole or covered with protective cover-up devices before work on the energized conductors is begun.

Neutral circuits shall never be open. Before a job is started, exposed vertical ground wire on wood pole structures within the work area shall be removed or covered with protective cover-up devices. Extreme care shall be exercised to prevent gaffing of protective cover-up devices.

Minimum Approach Distances:

Workers shall maintain a Working Minimum Approach Distance from all Energized parts when working on or near energized Conductors. Working Minimum Approach Distance (MAD) formerly Working Limits of Approach (Qualified Persons) is defined as the shortest distance allowable between energized live conductors and any part of a worker's body, material, or tool the worker is handling.

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Live Line Techniques are required for any approach to energized conductors that is closer than the distance specified in the Working Minimum Approach Distance table. Under no circumstances shall the worker's body, material, or tool the worker is handling come closer to the energized conductor than the distance specified in the Minimum Air Insulation Distance (MAID) formerly Absolute Limit of Approach (Qualified Persons) table, unless an Approved direct contact technique is being utilized.

Nalcor Energy Minimum Approach Distance

Nominal Operating Voltage		Minimum Air Insulation Distance- MAID		Minimum Approach Distance- MAD	
phase to phase	phase to ground	mm	m	mm	m
4.16 kV	2.4 kV	140	0.14	750	0.75
12.47 kV	7.2 kV	140	0.14	750	0.75
13.8 kV	7.96 kV	140	0.14	750	0.75
29.94 kV	14.4 kV	290	0.29	900	0.90
33 kV	19.05 kV	390	0.39	1000	1.00
34.5 kV	19.92 kV	390	0.39	1000	1.00
46 kV	26.56 kV	490	0.49	1100	1.10
66 kV	38.105 kV	600	0.60	900	0.90
69 kV	39.837 kV	600	0.60	900	0.90
138 kV	79.674 kV	900	0.90	1200	1.20
230 kV	132.79 kV	1400	1.40	1700	1.70
735 kV	424.35 kV	5400	5.40	5700	5.70

There is no Minimum Air Insulation Distance at these voltages when working directly on Primary Voltage Circuits using rubber gloves or other approved direct contact techniques. Unless working under the close supervision of a Qualified Person, unqualified persons shall not be allowed to approach exposed energized electrical lines or apparatus any closer than the distance specified below.

Contractors (unqualified persons) are expected to comply with the limits of approach as outlined in the OHS Regulations. The work of contractors must be stipulated in the respective electrical safety programs.

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Minimum Approach Distance (Unqualified Persons)

Nominal Circuit Voltages (phase to phase)	CSA Voltage Range (phase to ground)	Minimum Clearance (meters)
0.75 kV – 25 kV	0.4 – 22kV	3.0
-69 kV	22 - 50 kV	3.0
-138 kV	50 – 90 kV	4.0
-230 kV	120 – 150 kV	4.6
-345 kV	190 – 220 kV	5.2
-735kV	220 - 345 kV	6.7

Live Line Tools:

All Live Line work should be planned and carried out to facilitate removal of live line tools and protective cover-up devices at the end of the workday. Hot sticks and protective cover-up devices are all-susceptible to tracking and corona damage if left on the line for long periods, especially in inclement weather. Whenever possible, the hanging of live line tools on Conductors should be avoided.

Live line tools should not be used in rain, high winds, fog, or snow. In an emergency where fuse cutouts and/or disconnects must be operated, extra precautions shall be exercised such as the: wearing of rubber gloves; use of rain guards on the stick; and application of silicone to the stick immediately prior to use.

When using live line tools, workers shall not place their hands closer to the energized metal parts of the tools than that recommended below:

Normal Circuit Voltage	Minimum Voltage and Clear Stick Distance (meters)
0.75 – 25 kV	0.7
46 kV	0.8
69 kV	0.9
138 kV	1.1
230 kV	1.5
345 kV	2.1
735 kV	4.6

- Except as necessary to secure or release them, hold out ropes or live line tools being used to spread or raise conductors shall be securely fastened and workers shall not hold them.

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- The responsibility for seeing that live line tools are frequently inspected, tested and cleaned shall rest with the Supervisor.
- Live line tools such as grip-all sticks, switch sticks, and tools used in the everyday operations shall be dielectrically tested yearly or anytime they become suspect.
- Live line tools such as wire tongs, tie sticks, link sticks, strain sticks, and tools used exclusively for live line maintenance and generally transported in a proper trailer or carrier shall be dielectrically tested every three (3) years or anytime they become suspect.
- Live line tools showing any leakage shall not be used and shall be tagged with a Defective Tool or Equipment Tag and taken out of service.
- Fiber ropes and slings, used in conjunction with live line maintenance, shall be considered live line tools. Their care and storage shall receive the same attention as other live line tools.

Storage:

All live line tools not being regularly transported should be stored in a dry location and should not be tampered with or handled by un-authorized persons. Live line tools shall be kept free from dirt and moisture, and under no circumstances shall any live line tools be laid directly on the ground.

Transportation:

Live line tools should be transported and remain in the special portable containers designed for their transportation in a manner which prevents mechanical damage and provides protection from the weather.

Servicing:

Live line tools in unsafe condition and requiring treatment or repairs shall be tagged with a Defective Tool or Equipment Tag and exchanged for a tool in good condition. Un-authorized persons shall undertake no repairs.

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Protective Rubber Gloves:

Workers shall not touch or work on any exposed energized lines or apparatus except when wearing personal protective equipment approved for the voltage to be contacted.

Rubber gloves are not to be worn while climbing structures due to the risk of accidental punctures from wood splinters and other sharp pole hardware. However, rubber gloves shall be put on before entering the Minimum Approach Distance to energized lines or equipment and shall not be removed until the worker is completely out of the Minimum Approach Distance zone.

Only approved insulating gloves shall be used. Insulating gloves shall never be worn inside out or without leather protectors. They shall be exchanged any time they become damaged or if the worker to whom they are assigned has reason to doubt their condition. Leather protectors or over gloves shall not be worn except when in use over insulating gloves. When not in use, insulating gloves shall be stored in an approved canvas bag, in a cool dry place, away from high voltage equipment, and never stored inside out.

Insulating gloves shall be inspected for cracks or other damage and shall be given the roll and air test before each use.

Class 0 insulating gloves shall be worn on lines or equipment energized at 50 volts AC or 120 volts DC up to 750 volts AC/DC or when deemed necessary by the Supervisor.

Where the use of Class 0 gloves reduces the dexterity such that a greater hazard is created the work may be performed with insulated tools or equipment only. For example, working on protection and control circuitry behind a substation protection panel requires fine motor skills in a confined area. As such, in this case, the work may be performed without rubber gloves PROVIDED that the worker is using properly rated insulated tools and equipment.

Note: This exception does not apply to work involving aerial service conductors, street lighting, meter removal and other similar activities. In these cases, rubber gloves are mandatory, unless the line or piece of equipment has been confirmed to be de-energized and grounded.

Cover-up Devices:

Protective cover-up devices shall be used on primary voltage conductors, low voltage conductors, telephone circuits, and other wires which are immediately above, below or

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adjacent to the work area. Except for the part of the conductor which is being worked upon, when work is to be done on or near energized lines all energized and effectively grounded conductors or guy wires within reach of any part of the body while working shall have protective cover-up devices applied.

Line hose, hoods, blankets, line guards, etc., shall be visually inspected before each job. In applying protective cover-up devices, workers shall always protect the nearest and lowest wires first. In removing protective cover-up devices, the reverse order shall be maintained. When possible, protective cover-up devices shall be applied from a position underneath the conductor.

Rubber blankets and other protective cover-up devices shall not be placed on the ground without first protecting them from physical damage and moisture by means of a tarpaulin, canvas, or protective mat. To avoid corona and ozone damage, protective cover-up devices shall not be allowed to remain in place on energized lines or apparatus for long periods, nor stored in close proximity of energized equipment.

When not in use, protective cover-up devices shall be protected from mechanical and chemical damage, and shall always be stored in the containers provided or in special compartments on trucks. Nothing else shall be stored in these containers or compartments.

Arc Flash:

Arc Flash is a serious type of electrical explosion that can cause considerable property damage, personal injury, and even death. Any worker who is assigned to work or switch exposed energized equipment rated at 600 volts or above, shall wear the appropriate Personal Protective Equipment as prescribed in the charts below as a minimum.

For more information, please refer to Nalcor Corporate Health and Safety Standard 4.4.6.

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Nalcor Corporate Safety and Health Programs

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Appendix "N": Nalcor Corporate Safety and Health Programs

The following is the most current list of Nalcor Safety and Health Programs

- Hazard Recognition, Evaluation and Control and TBRA Information**-Hazard recognition, evaluation and control is a thorough examination of an operation (workplace) for the purpose of identifying what actual and potential hazards exist, evaluation the level of risk in each exposure and making decisions about the effectiveness of new and existing controls. Hazard recognition, evaluation and control are also a major part of the task based risk assessment process.
- Burning and Welding-** Due to the inherent hazards associated with the use of portable gas or electric arc equipment, burning and welding in any location not specifically designed for such activity is a high risk task. Areas specifically approved for burning and welding are enclosed by non-combustible walls, partitions or spark-tight curtains with non-combustible floors, ceilings and contents.
- Corporate Fall Protection Program** Nalcor Energy (Nalcor) is committed to providing a safe work environment for its employees and preventing occupational injuries due to falls. Fall Protection is an integral part of our commitment to a safe work environment. Any time a worker is exposed to a fall hazard there will be a procedure and equipment to reduce and/or eliminate the hazard of working at height. Fall Protection shall be achieved through a hierarchy of controls that will involve all levels of management, supervisory and field personnel. This hierarchy shall be: elimination of hazards through engineering (design) and procedural practices; control and mitigation of hazards through passive fall protection; travel restraint systems; the use of fall arrest systems; and finally the use of administrative controls. Supervisors and workers shall be expected to assess the risks associated with a task and ensure that proper mitigation is in place to protect them while climbing and working at heights. Where a worker is unsure of the methods, equipment or procedures to reduce the risk they are to seek direction from their supervisor.
- Disability Management Policy Statement** - Nalcor Energy is committed to assisting employees who have been injured on the job to return to work in a timely and safe manner through early intervention and active case management. To fulfill this commitment Nalcor Energy has established a Disability Management Program with a primary focus of providing injured employees a timely return to suitable and meaningful employment consistent with their functional abilities and competencies. The Disability Management Program process, as outlined in the Leadership Element of the Corporate Occupational Health and Safety Management System is consistent with the requirements of Sections 89 and 89.1 of the Workplace Health, Safety and Compensation (WHSC) Act and applicable policies of the WHSC Commission including the requirement to maintain active communication with

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injured employees, to protect the confidentiality of personal information, and to make every effort to accommodate injured employees per the Re-employment Obligations and Duty to Accommodate provisions of the WHSC Commission Policy RE-18. All stakeholders, whether they be management, union leadership, or employees, are responsible for actively developing, participating and cooperating in the disability management process

- **Incident Investigation** - Incident investigation processes are used to gather accurate information about, and analysis of, safety incidents, including “near misses”, to determine the contributing factors to help minimize the risk of recurrence, identify key prevention initiatives, and generate lessons learned. This is documented and communicated internally through the Corporate SafeWorkplace Observation Program (SWOP). While this database specifically addresses safety incidents, SWOP is also utilized to document and track incidents and/or losses related to the environment and property. Employees are required to report all safety incidents, including near misses, to ensure that appropriate preventative measures can be implemented to minimize risks, prevent recurrence and for continual improvement of the safety management system. Refer to Nalcor Corporate Health and Safety Standard 4.5.3.1
- **Noise Level Surveys and Hearing Conservation** - Nalcor Energy shall inform its employees of excessive noise levels in the workplace and provide working conditions and protective equipment to reduce the levels of exposure to those established by the Occupational Health and Safety Act & Regulations.
- **Personal Protective Equipment** - Nalcor Energy requires all employees and contractors wear approved Personal Protective Equipment (PPE) while working in designated work areas and while performing tasks where the use of PPE is compulsory.
- **Safety Footwear and Protective Clothing Allowance** Nalcor Energy will provide financial assistance to employees who, by the nature of their work, are required to purchase PPE, safety footwear and/or protective clothing. Employees covered by a Collective Agreement should refer to the appropriate clause in their Agreement.

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Section 9.0 – Appendix “O”

Nalcor Health and Safety Field Inspection Checklist

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Appendix “O”: Nalcor Health and Safety Field Inspection Checklist

General Information and Directions

The purpose of the H&S Field Inspection Checklist is to provide reference and record for conducting a site/field inspection.

When conducting an inspection of a specific field, use the list of items under each heading as a guide to identify areas of potential hazards or areas which need to be addressed.

Assure that all deficiencies, items marked “Not Acceptable”, are actioned via the Safe Workplace Inspection/Tour section of SWOP. Take note of the item and its corresponding SWOP observation reference number in the table provided.

For further information regarding HSE inspections, please refer to MSD-HS-011 Lower Churchill Project – HSE Inspection Guidelines.

Specific Field Input Directions

Place a checkmark in the box for each item which applies to the inspection (Acceptable, Not Acceptable, Not Applicable).

Any items which have been identified as “Not Acceptable” require corrective action and a SWOP card must be completed for each. Note the item and its corresponding SWOP card reference number in the table provided on the form.

Return the completed inspection form to the LCP-HSE Department along with any SWOP cards which may have been completed by hand. SWOP cards may also be submitted electronically

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Guidelines for Use

Introduction

The purpose of the H&S Field Inspection Checklist is to provide reference and record for conducting a site/field inspection.

Using the Checklist

When conducting an inspection of a specific site/field, use the list of items under each heading as a guide to identify areas of potential hazards or areas which need to be addressed.

Assure that all deficiencies, items marked “Not Acceptable”, are actioned via the Safe Workplace Inspection/Tour section of SWOP. Take note of the item and its corresponding SWOP observation reference number in the table provided.

For further information regarding HSE inspections, please refer to MSD-HS-011 Lower Churchill Project – HSE Inspection Guidelines

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Item	Accept	Not Accept	N/A
SITE GENERAL			
Lighting levels adequate for tasks performed.			
All light bulbs/tubes working and lighting covers adequately clean.			
General condition of walls, floors, floor coverings and ceilings good.			
Ventilation ducts clean and unobstructed.			
Staff/kitchen facilities provided away from work areas.			
Staff/kitchen facilities clean and tidy.			
HOUSEKEEPING			
Areas, accesses and landings free of obstructions/tripping hazards.			
Materials arranged/stored safely (including flammables).			
Tools orderly and clean. Unnecessary tools removed.			
Adequate disposal containers available/maintained.			
Adequate storage facilities provided.			
HYGIENE FACILITIES			
Toilets available and working.			
Cleanup facilities available.			
Areas clean and cleaning records maintained.			
FIRST AID			
Certified First Aider(s) identified and available.			
First aid station(s) available and appropriately equipped.			
Locations of first aid kits labeled and easily accessible.			
EMERGENCY RESPONSE			
Emergency exit routes identified and signed.			
Emergency exit lights operational.			
Emergency exit doors clear and easy to open.			
Required fire extinguishers up-to-date.			
Fire extinguishers identified by signs and 1 m clear area around.			
Evacuation maps displayed and up-to-date.			
Muster stations clearly marked.			
Emergency phones numbers displayed.			
Chief and emergency wardens identified and available.			

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Item	Accept	Not Accept	N/A
Emergency alarms checked and tested.			
Emergency equipment available (eye wash, chemical spill kit).			
PERSONAL PROTECTIVE EQUIPMENT (PPE)			
Adequate PPE provided where necessary (gloves, hard hats, etc).			
PPE properly worn where necessary.			
PPE stored and maintained correctly.			
JOB SITE POSTING / SIGNAGE			
Contractor identification sign.			
Contractor safety program.			
OH&S Act and Regulations.			
H&S Representative (name, trade, employer).			
First Aid Certificate.			
Warning signs and barricades adequately posted.			
HAZARDOUS MATERIALS			
Up-to-date MSDS available (no more than 3 years old).			
MSDS available where chemicals are used.			
Containers appropriately labeled.			
Hazardous materials safely stored and/or segregated.			
ELECTRICAL HAZARDS			
All electrical equipment in good condition.			
Electrical equipment inspected and maintained.			
Power boards used. Not double adaptors and piggyback plugs.			
Leads secured and not potential trip hazards.			
Power tools grounded or double insulated (CSA approved).			
Ground fault circuit interrupters in place.			
Explosion-proof devices where required.			
Equipment locked-out for repair.			
Compliance with corporate work protection code.			
Temporary power supply properly identified.			
Overhead lines flagged and secured.			
HAND/POWER TOOLS AND EQUIPMENT			
Guards in place/functioning.			
Grinding discs – speed rating and condition.			
Appropriate retainers (sockets, chippers, etc.)			


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Item	Accept	Not Accept	N/A
Tools/equipment in good condition.			
Defective equipment tagged as required.			
LADDERS, STAIRWELLS AND RAMPS			
No cracks or defects.			
Non-slip feet/bases.			
Correctly used and tied off.			
Non-metallic ladders used.			
Proper size and type.			
Proper handrail and landings.			
Proper filler blocks in metal stairs.			
Proper cleats on ramps.			
SCAFFOLDING			
Appropriately tagged and signed by installer.			
Footings properly supported and nailed.			
Top rail, mid rail and toe board in place.			
Properly erected.			
Proper access platform.			
Acceptable loading.			
Properly attached and capable of at least 4 times maximum load (suspended).			
Outrigger beam tied to fixed support with adequate counterweight (suspended)			
All mechanical/electrical devices in good condition (suspended).			
Independent lifelines for each worker (extend to ground) (suspended).			
SAFE WORK PRACTICES			
Personnel trained/qualified for the task.			
Permit to Work / Isolations / Lockouts used.			
Working and Height			
Safe Lifting Practices (Mechanical/Manual)			
Confined Space Entry procedures and testing.			
Precautions for work at high pressure in place.			
Hot/Cold Work			
Testing procedures.			

Additional Notes/Observations	SWOP Ref.


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LOWER CHURCHILL PROJECT

Risk Management Requirements for Contractors and Suppliers

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Approved by: 
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Revision					Remarks
N°	By	Verif.	Appr.	Date	
00	YR			08-Dec-2011	
PB	RC/YR			24-Aug-2011	



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1 INTRODUCTION

All key decisions made by the Lower Churchill Project team are risk-based. Package management is not an exclusion from this rule. Package risk management process adopted by the Project supports selection of Contractors and Suppliers in a way that allows reduce overall Project risk exposure. Same time, it promotes and supports development of effective Contractor's/ Supplier's risk management.

1.1 Purpose

To facilitate effective package risk management and put forward Risk Management Requirements for Bidders (Contract pre-award) and Contractors/ Suppliers (Contract post-award).


1.2 Scope

The scope of this document covers management of risks within the package scope both during the bidding process and after a Contract is awarded. It identifies general package Risk Management Requirements (Figure 1), namely, general guidelines to

- reply to the package Risk Questionnaire (pre-award),
- prepare package Risk Management Plan including package Risk Register (pre-award),
- update package Risk Management Plan (post-award),
- produce Monthly Risk Reporting (post-award).

Normally, a requirement to reply to the Risk Questionnaire is part of any package RFP. Whereas requirements to produce Risk Management Plan/ Risk Register or Monthly Risk Report (items A03 and A04 of SDRL) could be included to/ excluded from the package Risk Requirements. If included to the Requirements, the specific content of these documents will be stipulated by the package RFP (pre-award requirements) and the awarded Contract (post-award requirements) depending on the package scope, form / type of contract and package criticality.

If part of the package scope is to be actually performed on Contractor's/ Supplier's behalf by another parties, associated risks should be reflected in documents listed above.

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1.3 Definitions

Bidder: any entity that responds to a package request for purchase (RFP) issued by SNC-Lavalin on behalf of Nalcor Energy.

Contractor: Any entity that is awarded a contract package to provide on-site construction and/or installation services to Nalcor Energy, with SNC-Lavalin acting as the Nalcor's representative for contract administration.

Fixed Price Contract: a form of contract when payment to deem to cover all costs, overheads and profits, wherein the Contractor/ Supplier includes all necessary contingencies for possible risks. Usually includes Liquidated Damages clauses for a case of Contract term's violations. This type of Contracts is characterised by higher Contractor's/ Supplier's risk exposure.

LCP: The Lower Churchill Project.

RAM: Risk Assessment Matrix is tool to measure deviations from package Contract objectives.

RBS: Risk Breakout Structure identifies sources of risks relevant to package delivery, may be based on package WBS and reflect technical, commercial, organizational, economic, etc. aspects.


Reimbursable Contract: a Contract when all costs incurred in the performance of the Contract are reimbursed and a fee is paid to cover profit and overheads. This type of contracts is characterised by higher Owner's risk exposure.

Risk: A risk is a future event that, if occurs, may cause deviations from the Contract.

Risk Management: The systematic application of management procedures and practices aimed at establishing the context for identifying, analyzing, evaluating, addressing, monitoring and reporting risks.

Risk Register: a log of package risks identified and managed by a Bidder or Contractor/ Supplier that includes risk descriptions, risk addressing actions, assessments of the risks before and after addressing, etc.


SLI: SNC-Lavalin Inc.

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SDRL: Supplier Document Requirement List (document "Contractor Document Requirements"/ SLI # 505573-0000-37AG-I-0015). It includes the document requirements for either a Contractor or Supplier depending on a type of a package.

Supplier: Any entity that is awarded a Contract to provide equipment, materials or services to Nalcor Energy, with SNC-Lavalin acting as the Nalcor's representative for contract administration.

Unit Price Contract: a form of contract when payment to deem to cover fixed sum for each completed unit of work including all unit costs, overheads and profits as well as all necessary contingencies. This type of contracts usually used in case of construction packages is characterised by sharing of risks between the Owner and a Contractor/ Supplier. Namely, a Contractor/ Supplier bears the unit price risks, whereas the Owner covers risks associated with uncertainty about number of units.

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2 RISK MANAGEMENT DELIVERABLES

This section contains general guidelines on preparing major package risk management deliverables. Specific requirements and content of the deliverables (e.g., list of risks that are subject to Monthly Risk Reporting, etc.) will be defined by corresponding sections of RFP and the Contract.

2.1 Risk Questionnaire (Pre-award)


Risk Questionnaire contains a number of generic questions about Bidder's existing risk management system applicable to the proposed package Contract. In addition, some package related risk questions are included. They are based on risks preliminary identified by the Package Owner. The Risk Questionnaire is included to all package RFP's as a mandatory requirement. The Risk Questionnaire responses will be considered in the evaluation of Bidders.

2.2 Risk Management Plan (Pre-award & Post-award)

Depending on the package scope, form / type of contract and package criticality, package Risk Management Plan could be part of the Risk Requirements (SDRL item A04) both pre-award and post-award.

If included to the Requirements pre-award, the Risk Management Plan developed by a Bidder as part of the RFP response will be used for evaluation of Bidder's capability and should contain following items:

- Description of risk management process steps adopted by a Bidder for the contract scope of work / service (usually consists of risk identification, risk assessment "as-is" (before addressing), risk addressing, assessment "to-be" (after addressing), retirement and acceptance of risks)
- Description of organizational context of risk management (usually includes responsibilities of team members in the risk management process, types and frequencies of risk review meetings, risk reporting and communications including rules to prioritize risks, etc.)

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- Description of tools used to support the risk management process (usually includes list of risk categories (e.g. Risk Breakdown Structure (RBS)), Risk Assessment Matrix (RAM) and Risk Register)

Figure 2 provides the Risk Assessment Matrix (RAM) recommended to Contractors/ Suppliers for LCP. (Specific descriptions of risk impacts could be amended in some cases to better reflect package scope, budget and schedule.)

Risk Management Plan pre-award should contain full package Risk Register developed by a Bidder as an appendix using RAM of Figure 2.


Upon award of a Contract, the initial Risk Management Plan should be reviewed with the Package Owner. The content of a Risk Management Plan post-award (including list of risks included to Risk Register) is a subject to the Contract's Coordination Procedure. Guidelines to prepare Risk Registers are described in section 2.3.

2.3 Risk Register (Pre-award & Post-award)

A Risk Register is a log of package risks identified, assessed and addressed by a Bidder or Contractor/ Supplier. If indicated in a particular RFP, the full Risk Register should be submitted by a Bidder with its accompanying Risk Management Plan as part of response to Request for Proposals and will be considered by SLI during the evaluation process.

Depending on the form/ type of contract, managing of and reporting on some of the package risks post-award would be delegated to Contractor/ Supplier and becomes part of the package scope. However, reporting on some risks could not be mandatory in terms of these Risk Requirements. Same time, Contractor/ Supplier is encouraged to manage corresponding risks as part of its internal risk management. The list of risks that become part of the Risk Register post-award and subject to Monthly Risk Reporting (section 2.4) should be agreed and reflected in the Contract's Coordination Procedure. Its content depends on form/ type of contract and normally includes only risks of Medium and High level.

In case of fixed price/ unit price types of Contracts of supply packages, only risks of Schedule and Quality impacts normally become subject to reporting by Contractor/ Supplier post-award. Although, in

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case of fixed price/ unit price types of Contracts of on-site construction/ installation packages besides risks of Schedule and Quality impacts risks of Safety and Environment impacts become the subject to the Risk Requirements.


In case of reimbursable types of Contracts, Cost impacts become a subject to Risk Requirements for both supply and construction/ installation packages.

Managing risks of impacts on Reputation is optional in terms of these Risk Requirements for any types of contract. However, a Contractor/ Supplier could be interested in managing corresponding risks on its own by obvious reasons.

The approved list of package risks that become part of the Risk Register post-award and subject to Monthly Reporting (section 2.4) should be reflected in the Contract's Coordination Procedure.

Following items should be included to a Risk Register both pre-award and post-award for each selected risk (Figure 3):

- Risk Identification No.
- Risk title
- Risk definition (recommended is three part risk definition: cause(s) – risk event – impact(s))
- Comments (additional relevant notes and insights on risk definition and description)
- Risk status (it could be proposed, active, retired, accepted)
- Risk owner (a member of the Bidder's or Contractor's/ Supplier's team who is responsible for managing of a risk)
- Risk category (as part of Risk Breakdown Structure it could point to technical, commercial, organizational, economic, etc. types of risks)
- Assessment of probability of occurrence and impact(s) before addressing ("as-is") (according to the RAM)
- Response strategy (avoid, mitigate, transfer, accept)
- Addressing actions (particular steps to support selected addressing strategy including measures in place)
- Action status (it could be proposed, active, on-hold, completed, retired)

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- Comments on progress of the addressing strategy and actions (is used in Monthly Reporting post-award)
- Assessment of probability of occurrence and impact(s) after addressing (“to-be”) as if all the proposed addressing actions were already implemented (according to the RAM)

Note: As a general rule, representatives of SLI and/ or Nalcor Energy do not take part in risk identification and assessment sessions in case of fixed price and unit price types of Contracts, while in the case of reimbursable type of contract their participation would normally occur. Specific level of involvement of representatives of SLI and Nalcor Energy in risk identification and assessment sessions is to be stipulated by the Contract’s Coordination Procedure.

Following contract award the approved Risk Register should be regularly updated by the Contractor/ Supplier during the phases of the package delivery and submitted as part of Monthly Progress Reports.

2.4 Monthly Risk Report (Post-award)

Monthly risk reporting (as part Monthly Progress Reports) is defined by item A03 of SDRL and consists of two parts. Part One is a structured narrative that describes major risk activities and events during the reporting period and should contain:

- Comments on major changes in the risk register (addition of new risks or addressing actions, change of risk ownership or status, retirement of risks, risk re-assessments, etc.) with a focus on Medium and High level risks.
- Highlights of 5 to 7 most important package risk management activities and events (e.g., risk reviews and workshops (internal and with sub-vendors), implementation of addressing actions and possible related issues, successes and failures related to risk management, any occurred risks, etc.)


Part Two is an updated package Risk Register.

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3 RISK MANAGMENT REVIEWS

Standard requirement is to hold Monthly Risk Reviews based on submitted Monthly Risk Reports.


Review requirements, including types and frequency of the risk management reviews and audits post-award, will be initially introduced in the package RFP and finally stipulated by the Contract's Coordination Procedure.

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4 FIGURES

4.1 Summary of the Risk Requirements for Bidders and Contractors/Suppliers


	Requirement	Description	Reference Documents
Pre-Award	Risk Questionnaire	Contains list of generic risk questions as well as package specific ones; requirements are described in section 2.1.	Appendix of RFP
	Risk Management Plan	Provides description of the risk process, organizational context and tools adopted by a Bidder; requirements are described in section 2.2.	SDRL item A04; Appendix of RFP
	Risk Register (part of the Risk Management Plan)	A log of package risks developed by a Bidder including their assessments before addressing, their addressing actions and assessment after addressing; requirements are described in section 2.3.	SDRL item A04; Appendix of RFP
Post-Award	Risk Management Plan	Provides description of the risk process, organizational context and tools adopted by a Contractor/ Supplier and agreed upon in the Contract's Coordination Procedure; requirements are described in section 2.2.	SDRL item A04; Contract's Coordination Procedure
	Monthly Risk Report	A summary of monthly activities carried out by a Contractor/ Supplier aimed at addressing selected risks; the Coordination Procedure of the Contract defines if all package risks are subject to monthly reporting or only selected ones; requirements are described in section 2.4. Normally, Monthly Risk Reports are a subject to Monthly Risk Reviews.	SDRL item A03; Contract's Coordination Procedure
	Risk Register (part of the Monthly Report)	The Coordination Procedure of the Contract defines if all package risks are subject to monthly reporting by the Contractor/ Supplier or only selected ones; requirements are described in section 2.3.	SDRL item A03; Contract's Coordination Procedure

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4.2 Recommended Package Risk Assessment Matrix

Risk Ranking Score = (Impact Score) x (Probability Score)	Risk Level Colour Code	Low	Medium	High
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		IMPACT				
		Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Extreme (5)
PROBABILITY	>90% Almost Certain (5)	5	10	15	20	25
	50% - 90% Likely (4)	4	8	12	16	20
	1% - 50% Possible (3)	3	6	9	12	15
	0.1% - 1% Low (2)	2	4	6	8	10
	< 0.1% Rare (1)	1	2	3	4	5
PROJECT OBJECTIVES	Capital Cost, \$M	< 0.1	0.1 - 1	1 -- 10	10 - 100	>100
	Schedule, Mos (First Power Target Date)	< 0.25	0.25 - 1	1 -- 3	3 -- 12	>12
	Product Quality (Availability, Reliability, Performance)	Potential degradation of element performance, system level not affected.	Decrease in system performance, however still above requirement.	Decrease in system performance eliminates all design and operating margins.	Decrease in system performance that substantially affects performance objectives.	System requirement is not achieved, safety objectives are not achievable. System or element is effectively useless.
	People (Health & Safety)	Minor impact on personnel. First aid only. No lost time.	Potential to cause medical treatment of personnel. Lost time incident.	Injury to personnel that does not result in some permanent disability. Multiple lost time incidents outside established targets.	Serious personal injury resulting in permanent disability. Total lost time well outside established targets to the point where operations are temporarily suspended.	Potential to cause single or multiple fatalities.
	Environmental (Physical)	Slight Effect: e.g. Non-reportable spill or release contained within the immediate work area, negligible financial consequences, no lasting effect.	Minor Effect: e.g. Sufficiently large contamination or discharge to damage environment, but no lasting effect. Single breach of statutory or prescribed limit or single complaint.	Localized Effect: e.g. limited discharges affecting the local area and damaging the environment. Repeated breaches of statutory/regulatory limit or multiple complaints.	Major Effect: e.g. Severe environmental damage. The company is required to take extensive measures to restore the damaged environment. Regulatory restriction or enforcement action probable.	Massive Effect: e.g. Persistent severe environmental damage or severe impact extending over a large area resulting in major financial implications for the Project. Direct impact on public with prosecution possible.
	Reputation	No or very minor media attention. Little or no loss in Package Owner's trust.	Some unfavourable media attention. Some loss in Package Owner's trust which can easily be rebuilt.	Local media coverage only. Some loss in Package Owner's trust that will require commitment to rebuild.	Local and possibly national media coverage. A loss in Package Owner's trust that it is doubtful whether it can be rebuilt.	National and international media coverage. An irreparable loss in Package Owner's trust.

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4.3 Sample Risk Register Template

RISK DEFINITION				RISK ATTRIBUTES			ASSESSMENT "AS-IS"							RISK ADDRESSING				ASSESSMENT "TO-BE"						
ID	Title	Three Part Definition	Comments	Status	Owner	Category	Probability	Cost	Schedule	Product Quality	Safety	Environmental	Reputation	Response Strategy	Action(s)	Action Status	Comments on Progress	Probability	Cost	Schedule	Product Quality	Safety	Environmental	Reputation
R-1	Sub-Vendor's Skilled Labour Availability	Due to heated market conditions in Sub-Vendor's industries, shortage of Sub-Vendor's skilled labour could take place , leading to longer delivery timelines and overall package schedule delays	TBD	Proposed	TBD	Commercial	3	0	4	0	0	0	4	Mitigate-Prevent	TBD	Proposed	TBD	3	0	4	0	0	0	4



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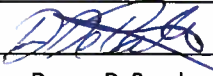

<p>Comments:</p> <p>This document supersedes the LCP Project-Wide Environmental Protection Plan for Component 3 and 4a (NE-LCP Document # LCP-SN-CD-0000-EV-PL-0008-01)</p>	<p>Total # of Pages: (Including Cover): 174</p>
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Status / Revision	Date	Reason for Issue	Prepared by	Functional Manager Approval	Quality Assurance Approval	Project Manager (Generation + Island Link) Approval
B1	23-Jul-2013	Issued for Use	<i>A. Stephen</i>	<i>M. Organ</i>	<i>D. Green</i>	<i>R. Power</i>
A1	02-Jul-2013		A. Stephen	M. Organ	D. Green	R. Power

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Inter-Departmental / Discipline Approval (where required)

Department	Department Manager Approval	Date
Project Manager DC Specialties	 Darren DeBourke	<i>26 Jul 2013</i>
Project Manager Overland Transmission	 Kyle Tucker	<i>24 Jul 2013</i>

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Maintenance of the Project-Wide Environmental Protection Plan (P-WEPP)

This P-WEPP will at times require updating in response to changes in the Project, contractor work methods, group structure, or technological advancements that provide higher level of environmental protection. The subsections below indicate the process with respect to maintenance and implementation of the P-WEPP.

Initiating Revisions

This P-WEPP is a controlled document and revisions may only be processed by the Environmental Manager. It is anticipated that most of the revisions to this P-WEPP will be initiated by the environmental management team at the site or at the Lower Churchill Project office in St. John's.

Project staff shall request revisions through document control. P-WEPP holders and readers/reviewers (within SLI, government agencies, contracting firms, other stakeholders, etc) may request revisions by forwarding a completed Revision Request Form (RRF) (Nalcor Doc # TBD), to the Environmental and Regulatory Compliance Manager. These revision requests will be screened and reviewed by project staff, and forwarded to the Project Manager for approval.

Compliance Instructions

Revision requests that have been accepted by the General Project Manager and Environmental and Regulatory Compliance Manager will be sent to the Regulatory Compliance Leads for distribution to key Project participants as "Compliance Instructions". These instructions shall be signed off by key holders of the P-WEPP and returned within two (2) days of receipt. A log of compliance instructions shall be maintained by the Environmental Coordinator, and these will be incorporated periodically into a revised edition of the P-WEPP.

Revision Procedures

Revisions to the P-WEPP shall be made annually, or as required, in accordance with the document control procedures. The Regulatory Compliance Leads will issue the accepted revisions of the P-WEPP to key holders, Contractors, and readers/reviewers. Each revision will be accompanied by a Revised Control Record (provided in Section 8) that:

- a) Identifies all compliance instructions that have been issued since the last revision; and
- b) Lists the sections being superseded.

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Within two working days of receiving a revised Plan, P-WEPP holders shall:

- a) Familiarize themselves with revised sections of the P-WEPP;
- b) Incorporate all revisions into their areas of responsibility, as appropriate;
- c) Ensure that all personnel are familiar with the revisions; and
- d) Acknowledge receipt of the revised P-WEPP by forwarding via fax, email, or mail a signed and dated Acknowledgement Form to the Environmental Engineering Manager.

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ABBREVIATIONS AND ACRONYMS

Abbreviation	Description
C-SEPP	Contract-Specific Environmental Protection Plan
DFO	Department of Fisheries and Oceans Canada
DOEC	Newfoundland and Labrador Department of Environment and Conservation
EA	Environmental Assessment
EEMP	Environmental Effects Monitoring Plan
ERP	Emergency Response Plan
FSL	Full Supply Level
GAP	Gasoline and Associated Products Regulations (NL)
H&S	Health and Safety
HVac	High Voltage Alternating Current
HVdc	High Voltage Direct Current
kVac	Kilovolt Alternating Current
kVdc	Kilovolt Direct Current
LSL	Low Supply Level
MCTS	Marine Communication and Traffic Services
MSRP	Master Spill Response Plan
MW	Megawatt
NWPA	Navigable Waters Protection Act
P-WEPP	Project-Wide Environmental Protection Plan
PAO	Provincial Archeological Office
RCC	Roller Compacted Concrete
RCP	Regulatory Compliance Plan
RFP	Request for Proposals
RP	Rehabilitation Plan
RRIF	Revision Request Initiation Form
SLI	SNC Lavalin Inc.
SOP	Standard Operating Procedures

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Abbreviation	Description
TC	Transport Canada
TSS	Total Suspended Solid
WMP	Waste Management Plan – Component 1 and 4b

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1 INTRODUCTION

Environmental Protection Plans are of critical importance to large construction projects. The P-WEPP will ensure a high level of environmental protection in all of the Project's work areas during construction and commissioning. This P-WEPP is a working document for use at site by Project personnel and contractors. It will help ensure conformance with the Project policy statements. It also will serve as a tool for Project participants, including regulators, to monitor regulatory compliance and to improve on environmental performance.

This P-WEPP contains standard environmental protection procedures, or mitigation measures, for activities commonly associated with large projects of this type. The objectives of this P-WEPP are to:

- a) Anticipate potential negative environmental effects associated with construction; and
- b) Implement appropriate mitigation measures to minimize or avoid negative effects where practical.

Negative effects include impacts to air quality and climate, groundwater and surface water resources, soil, biota and their habitats, human health and communities, and natural and historic resources.

Reference documentation including publically available Federal and Provincial reference documents, guidelines, fact sheets and operational statements for information detailed in the P-WEPP is located in reference document # GV-0003-01. A list of reference documents is outlined in Section 9.

1.1 Purpose

The purpose of this P-WEPP is to establish work practices and assign roles and responsibilities that all Project participants shall follow to mitigate negative environmental effects associated with construction and commissioning of the Lower Churchill Project.

Specifically the purpose of this P-WEPP is to:

- a) Document the conditions and requirements of Environmental Assessment (EA) release;

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- b) Outline the Lower Churchill Project's commitments to minimize potential environmental effects - including commitments made in the Environmental Impact Statement (Nalcor, 2012) during the regulatory review process under the Joint Review Panel (JRP);
- c) Provide concise and clear instructions to Lower Churchill Project participants regarding procedures for protecting the environment and minimizing potential impacts to the environment;
- d) Provide direction to Lower Churchill Project participants regarding issues and concerns of stakeholder groups including aboriginal peoples, fisheries groups, landowner groups and the public;
- e) Provide a reference document for Lower Churchill Project participants to use when planning and/or conducting specific construction and commissioning activities;
- f) Provide direction for environmental orientation programs for Lower Churchill Project participants;
- g) Document changes to the P-WEPP originating through the interactive revision process;
- h) Provide a reference to applicable legislative requirements and guidelines; and
- i) Provide a detailed summary of environmental issues and protection measures to be implemented during construction.

1.2 Scope and Application

The scope of this P-WEPP covers the engineering, procurement, construction, and commissioning phase of the Lower Churchill Project for Components 3 and 4a. The focus of the P-WEPP is on construction activities, including activities associated with the Labrador Island Transmission Link from Muskrat Falls to Soldier's Pond as well as switchyards and other HVdc specialties. Section 2 describes the Project in more detail. Please note that there are additional components of the Project that are outside the scope of this P-WEPP. They include the following:

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- a) Component 1: Muskrat Falls Generation Facility including the proposed reservoir, site access roads, accommodations complex and laydown areas;
- b) Component 2: Gull Island Generation Facility;
- c) Component 4b: The 315kV HVac transmission line from Muskrat Falls to Churchill Falls and associated infrastructure; and
- d) The cable crossing at the Strait of Belle Isle.

In addition, this P-WEPP does not cover the Operations phase of the project a separate EPP for this will be developed and submitted at a later date.

This P-WEPP is one component of the Lower Churchill Project's *Environmental Management Plan (Document # LCP-PT-MD-0000-EV-PL-0002-01)*. Other subordinate documents of the Environmental Management Plan include the following:

- a) *Project-Wide Environmental Protection Plan for Component 1 and 4b (Document # LCP-SN-CD-0000-EV-PL-0002-01)*
- b) *Contract-Specific Environmental Protection Plan (C-SEPP) Template (Document # LCP-SN-CD-0000-EV-PL-0006-01)*
- c) *Rehabilitation Plan (RP) (Document # LCP-SN-CD-0000-EV-PL-0004-01);*
- d) *Regulatory Compliance Plan (RCP) (Document # LCP-SN-CD-0000-RT-PL-0001-01);*
- e) *Waste Management Plan (WMP) - Component 1 and 4b (Document # LCP-SN-CD-0000-EV-PL-0005-01); and*

LCP's *Emergency Response Plan* is a companion document to the *Environmental Management Plan*. It contains a *Master Spill Response Plan*, which shall be used by contractors as a basis for preparing their own spill response plans.

This P-WEPP applies to all Project participants, including project staff, contractors, subcontractors, suppliers, service providers, and all employees of these organizations.

Given the Lower Churchill Project's magnitude, accepted *Contract-Specific Environmental Protection Plans (C-SEPPs)* shall be required. C-SEPPs shall be prepared by all contractors for all construction contracts to ensure that effects on the environment are minimized to the extent practical. These C-SEPPs shall provide sufficient detail on the Contractor's:

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- a) Scope of work;
- b) Methods of construction;
- c) Sequence of activities;
- d) List of resources (i.e. equipment and site workforce);
- e) Temporary and permanent installations;
- f) Environmental protection procedures and alternative procedures, if required;
and
- g) Environmental contingency measures.

This P-WEPP shall serve as a resource to contractors as they prepare their own C-SEPPs. Contract packages shall include C-SEPP templates, with specific instructions on how these templates are to be properly completed. All C-SEPPs shall require acceptance by the Project prior to the contractor's mobilization to site.

In certain cases, particularly in areas where environmental risks are elevated, specific mitigation measures shall be engineered for the Project. These measures, detailed in the form of technical specifications and construction drawings, shall form part of the contract packages.

2 PROJECT DESCRIPTION

The proposed Project will extend over a distance of approximately 1,100 km, and includes the following key components:

2.1 HVdc Specialties (Component 3)

- a) an ac to dc converter station at Muskrat Falls near the lower Churchill River in Central Labrador;
- b) a dc to ac converter station at Soldiers Pond, with some associated Island system upgrades;
- c) electrodes in the Strait of Belle Isle (L'anse Au Diable, Labrador) and Conception Bay (Dowden's Point, Newfoundland), connected to their respective converter station by a small overhead transmission line;

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- d) transition compounds at Forteau Point and Shoal Cove to transition overhead lines to underground and submarine cables;
- e) ac switchyards at Soldier's Pond and Muskrat Falls;
- f) synchronous condensers at Soldier's Pond;
- g) permanent telecommunication services including telecom rooms, internal and external cabling with copper and fibre optic cables, core switches, servers and other equipments, distribution equipments and accessories and access and terminals equipment. Permanent telecommunication services will be provided at all switchyards, converter stations, transition compounds, electrode sites, synchronous condenser site the powerhouse and the spillway; and
- h) permanent access roads to Forteau Point, L'Anse au Diable, Shoal Cove, Dowden's Point and Soldiers Pond.

2.2 Labrador Island Transmission Link (sub-Component 4a)

- a) an overhead HVdc transmission line from Muskrat Falls to the Strait of Belle Isle (approximately 383 km);
- b) an overhead electrode line from the HVdc transmission line to Lanse-Au-Diable (approximately 22km);
- c) an overhead HVdc transmission line from the Strait of Belle Isle to Soldiers Pond on the Island's Avalon Peninsula (approximately 695 km); and
- d) an overhead electrode line from the Soldier's Pond to Dowden's Point (approximately 12km).

2.3 Construction Related Infrastructure

Construction related infrastructure will be established to support construction activity for components 3 and 4a. Some of this infrastructure is temporary and shall be decommissioned before the end of the construction phase. It is anticipated that the following infrastructure will be required:

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Component 3

- a) temporary construction camps at Forteau Point, L'Anse au Diable, Churchill Falls and possibly Shoal Cove;
- b) rock quarries for L'Anse au Diable and Dowden's Point breakwaters;
- c) borrow pits and crushing facilities for construction fill and surfacing materials at Forteau Point, L'Anse au Diable, Shoal Cove, Dowden's Point and Soldiers Pond;
- d) local concrete batch plants at each remote site (except Soldier's Pond and Muskrat Falls);
- e) construction power at all sites;
- f) communication facilities (telephone, internet) required at all sites;
- g) equipment fuel facilities at all sites;
- h) spoil disposal areas at all sites;
- i) temporary office and sanitary facilities at all sites;
- j) waste disposal at all sites;
- k) heavy equipment transport facilities to move large transformers to site (at Churchill Falls, Muskrat Falls and Soldiers Pond). May require temporary road or bridge reinforcement or repairs and power line raising or outages by contractor(s);
- l) insulating oil storage tanks for transformer oil (many thousands of litres) and treatment facilities;
- m) SF6 and welding gas cylinder storage and handling facilities;
- n) blasting materials storage facilities;
- o) telecommunication services for the hydroelectric site at Muskrat Falls, the HVac switchyards, converter stations, transition compound and electrode sites, remote camps at various locations throughout the project and marshalling yards;
- p) telecommunication infrastructure at the Churchill Falls and Soldier's Pond Switchyards, the Transition Compounds, the Electrode Sites, the Construction

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Camps and Marshalling yards include an office trailer and telecom rooms, core infrastructure and equipment in the telecom rooms and electronic equipments inside the trailer offices; and

- q) telecommunication infrastructure at the Muskrat Falls Switchyard includes an office trailer and telecom rooms, core infrastructure and equipment in the telecom rooms, pole for the radio and cellular system, and telecom services in the accommodation facilities.

Component 4a

- a) HVdc ROW clearing camps and all associated infrastructure;
- b) HVdc transmission line construction camps and all associated infrastructure;
- c) temporary access, bypass and corduroy roads for both ROW clearing and transmission line construction;
- d) temporary bridges and culverts for both ROW clearing and transmission line construction;
- e) borrow pits and possible quarries;
- f) material storage and laydown areas;
- g) fuelling and fuel storage facilities;
- h) possible helipads and associated facilities;
- i) temporary ac transmission line relocations at Soldiers Pond; and
- j) temporary construction camp(s).

3 ROLES AND RESPONSIBILITIES

The Lower Churchill Project Environmental and Regulatory Compliance (ERC) Team is comprised of environmental, engineering, and construction management staff. A Responsibility Matrix is provided in Figure 3-1. Figure 3-2 illustrates the team structure. Roles and responsibilities of team members are further defined in the sections that follow.

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Activity	Project Manager Environmental and Regulatory Compliance Manager Environmental Engineering Manager Regulatory Co-ordinator Permits Compliance Lead Project Manager Construction Managers Interface Managers Area Manager On-Site Environmental Monitors SLI Staff Contractors													
Development of the P-WEPP	A	R	R	R	S	S	S	S	I	I	I	S	I	
Review of P-WEPP	A	R	R	I	S	C	C	C	C	C	I	I	I	
Accept P-WEPP	A	I	I	I	I	I	I	I	I	I	I	I	I	
Implementation of the P-WEPP	A	R	R	R	S	S	R	R	I	R	R	R	R	
Management/Revisions of the P-WEPP	A	R	R	R	C	C	I	C	I	I	S	S	I	
Development of the C-SEPP	I	S	S	S	S	S	S	S	I	I	I	I	A/R	
Review of the C-SEPP	A	R	R	R	S	C	C	C	I	I	I	I	I	
Accept C-WEPP	A	R	R	R	I	I	I	R	I	I	I	I	I	
Implementation of the C-SEPP	R	R	R	R	S	R	R	R	I	R	R	R	A/R	
Management/Revisions of the C-SEPP	R	R	R	R	C	S	I	R	I	I	S	S	A/R	
Toolbox Meetings	R	R	S	C	C	C	R	R	I	C	R	I	A/R	
Project Environmental Awareness														
(i) LCP Personnel Orientation	A	R	S	R	C	S	R	R	R	R	R	R	I	
(ii) Visitor Orientation	A	R	S	R	C	I	R	R	R	R	R	R	I	
(iii) Contractor Orientation	A	R	S	R	C	S	R	R	R	R	R	S	R	
Environmental Compliance Monitoring														
(i) Daily Field Reports	A	R	R	R	S	S	R	R	I	C	R	S	C	
(ii) Quarterly Environmental Audits	A	R	R	R	C	C	C	S	I	I	S	I	C	
(iii) Annual Environmental Performance Review	A	R	R	S	S	S	C	S	I	I	S	I	I	
Managing Compliance Tracking Registry	A	R	I	R	R	R	I	R	I	S	S	S	I	
Environmental Effects Monitoring	I	I	I	I	I	I	I	C	I	I	I	I	C	

Accountable, Responsible, Supports, Consulted, Informed
P-WEPP: Project-Wide Environmental Protection Plan
C-SEPP: Contract-Specific Environmental Protection Plan

Figure 3-1: Responsibility Matrix

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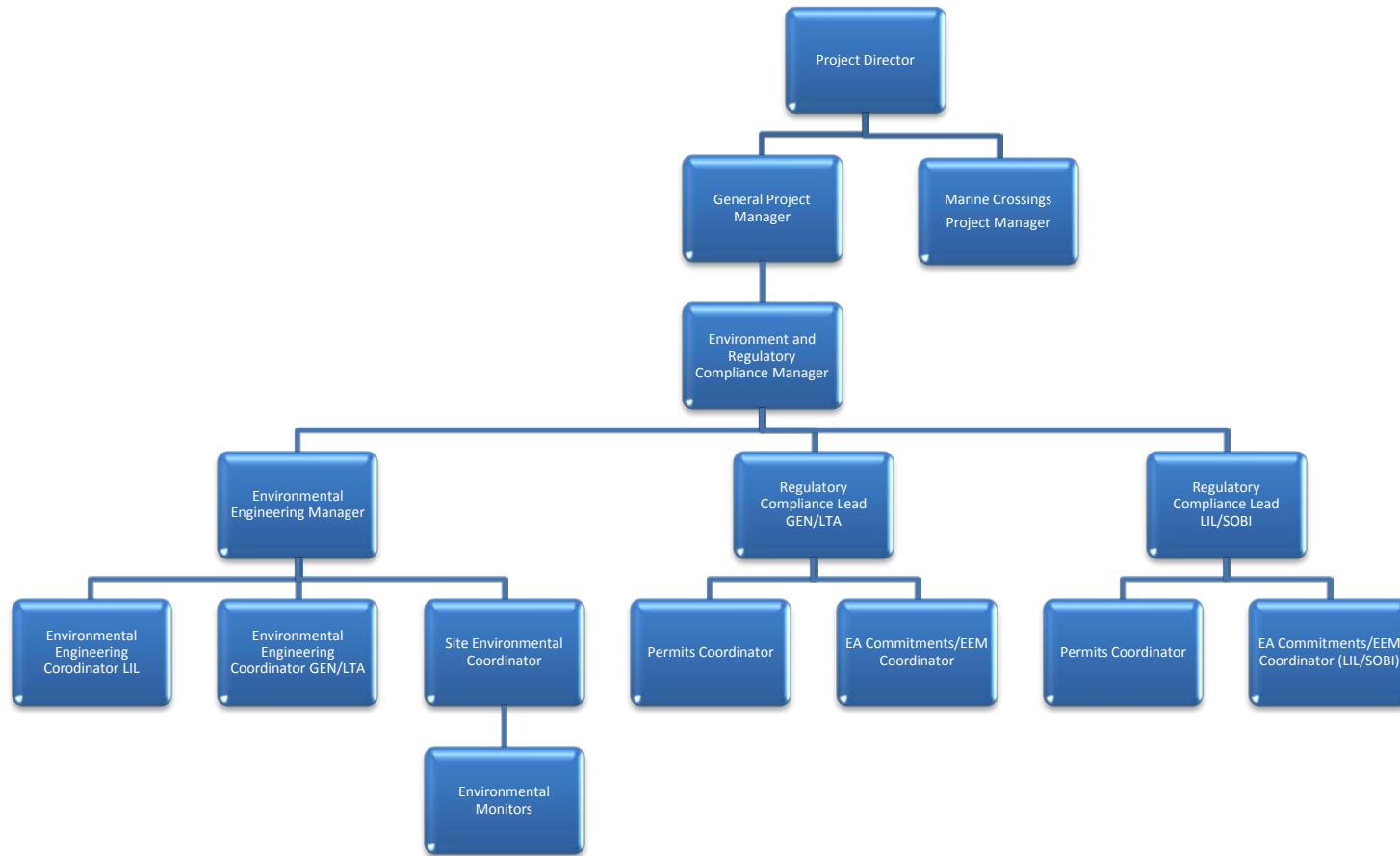


Figure 3-2: Lower Churchill Project Hydroelectric Generation Facility Project: Environmental Management Team

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3.1 Environment and Regulatory Compliance Team – Lower Churchill project

3.1.1 Auditing Function

The purpose of the auditing function shall be to evaluate the performance of the P-WEPP and to identify opportunities for continual improvement.

Auditing shall consist of daily field reports, quarterly environmental compliance audit reports and annual performance reviews.

The daily field reports shall be completed by the On-Site Environmental Monitor, who reviews daily activities of the Contractors. The quarterly environmental compliance audit reports shall be completed by a member of the ERC team. The reports shall document all incidents of non-compliance with the P-WEPP and their causes. The ERC team shall distribute the Environmental Compliance Audit Reports to relevant Project participants.

The annual performance review shall be completed by the key members of the Environmental and Construction teams. This audit shall include a review of all work activities that relate to environmental concerns, issues and/or mitigations and shall include a review of environmental audits carried out by the ERC team during the year. The review process shall give all parties a chance to evaluate overall environmental performance and compliance with government regulations, permits, this P-WEPP, and C-SEPPs.

3.1.2 Individual Responsibilities

General Project Manager: The General Project Manager shall be accountable for the acceptance of the P-WEPP. The General Project Manager shall be consulted on the various aspects of P-WEPP management. This person shall also be consulted on Environmental Compliance Monitoring processes such as daily field reports, quarterly environmental audits and annual environmental performance reviews. Environmental Effects Monitoring is the responsibility of the ERC team and the General Project Manager shall be accountable for this. The General Project Manager shall be supported in this function by the ERC manager.

Environment and Regulatory Compliance (ERC) Manager: The ERC Manager shall be accountable for development, acceptance, implementation and management of the P-WEPP. They shall be accountable for review and acceptance of the C-SEPP. The ERC Manager shall be informed of all activities accountable and responsible by the ERC Team. The ERC Manager is considered to be accountable for implementation and management of the C-SEPP, along with the Contractor.

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Environmental Engineering Manager: The Environmental Engineering Manager shall be responsible for the development, review, implementation and management of the P-WEPP and review, acceptance and implementation of the C-SEPP as well as all environmental compliance monitoring. The Environmental Engineering Manager shall be informed of all activities accountable and responsible by the ERC team such as acceptance of the P-WEPP and C-SEPP and environmental effects monitoring.

Regulatory Compliance Lead: The Regulatory Compliance Lead is responsible to review and ensure commitments and requirements of EA release are included in P-WEPP as it relates to their components. They are responsible to ensure legislative and permit conditions are reflected in the P-WEPP. They are also responsible for communicating results of the EEMP to the ERC group.

Environmental Engineering Coordinator: The Environmental Coordinator shall be responsible for implementation of the P-WEPP as it relates to their component. They shall support the Environmental Engineering Manager with managing changes to the P-WEPP. They shall also be responsible for review, acceptance and implementation of the C-SEPP. They shall be responsible for Project Environmental Awareness such as orientation of project employees, visitors and contractors. They shall be responsible for certain aspects of environmental compliance monitoring such as reviewing daily field reports and quarterly environmental audits. They shall be informed on environmental effects monitoring details.

Permits Coordinator: The permits coordinator shall provide support for the development and implementation of the P-WEPP and shall be consulted on management or revisions of the P-WEPP. This person shall provide support for C-SEPP implementation and project environmental awareness through orientation. The Permits Coordinator shall provide support and consultation for several aspects of environmental compliance monitoring. This person shall also be consulted on the review of the P-WEPP to ensure compliance with condition of permits. The Permits Coordinator shall be responsible for managing the permit registry (in consultation with the Environmental Engineering coordinators) and shall be informed on environmental effects monitoring details.

Project Managers: The Project Managers shall provide support for the development of the P-WEPP and the C-SEPP and shall be responsible for implementation of the C-SEPP. They shall be informed about all aspects of the P-WEPP, C-SEPP and compliance tracking.

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Construction Managers: The construction managers shall be responsible for overseeing construction management including management of on-site environmental issues through implementation of the P-WEPP. They shall also be responsible for the acceptance and implementation of the C-SEPP and also for revisions to this document. The Construction Managers shall report directly to the Project Manager and shall be responsible for certain aspects of environmental compliance monitoring and compliance tracking. The Construction Managers shall also be responsible for ensuring visitors, contractors and employees to the site receive the appropriate orientation and training required.

Area Manager: The Area Managers shall be informed on all aspects of the development of the P-WEPP and C-SEPP. They shall be informed of environmental compliance monitoring and environmental effects monitoring and shall provide support for managing the compliance tracking registry.

Package Lead: The package leads shall be responsible for ensuring the P-WEPP is included in procurement packages. The package lead shall support acceptance and implementation of the C-SEPP. They shall be informed about all aspects of the P-WEPP, C-SEPP and compliance tracking.

Site Environmental Coordinator: This individual will coordinate all activities and monitoring effort by the Site Environmental Monitors to ensure the P-WEPP, C-SEPP, and permit conditions are complied with. The Site Environmental Coordinator will report directly to the Environmental Engineering Manager, and interface functionally with the Environmental Engineering Coordinator and the Permits Coordinator.

Site Environmental Monitor: The site environmental monitor shall monitor on-site Project activities, evaluate the Contractors' environmental performance with respect to requirements established in the P-WEPP and C-SEPP, evaluate the performance of designed/constructed environmental mitigation systems through sampling and testing programs, and track on-site compliance with regulatory requirements and conditions of all permits and approvals. They shall be responsible for producing daily field reports as part of environmental compliance monitoring and shall provide support for managing the non-conformance registry. The On-Site Environmental Monitors shall report directly to the Site Environmental Coordinator and functionally to the Environmental Engineering Coordinators, interact with the Contractors on environmental procedures and requirements, participate in Project team meetings, toolbox meetings, conduct environmental reviews of drawings, and assist in the revision and update of

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the P-WEPP and C-SEPP as necessary. The Site Environmental Monitors shall also be responsible for ensuring employees, visitors and contractors to the site receive the appropriate orientation and training before going on site.

3.2 Contractors

Contractors shall build, supply and/or install various components of the Project, or be involved in provision of services to support construction and/or procurement, as defined in the work scopes of their respective contract packages. The contractors shall be accountable and responsible for implementing environmental protection procedures as outlined in the P-WEPP and developing, implementing, and maintaining their own C-SEPP, as applicable. They shall be responsible for holding toolbox meetings at the start of each shift to discuss health, safety and environmental issues and shall be responsible for developing their own orientation and training package to deliver to individuals entering worksites on their behalf in addition to the project training noted above. They shall ensure P-WEPP conditions are reflected in their proposals and bids and shall comply with all relevant regulations, guidelines, permits, approvals and authorizations. The contractor may be consulted, as required; on aspects of environmental compliance monitoring and environmental effects monitoring.

3.3 Project Environmental Awareness

3.3.1 Employee Orientation

A Project environmental orientation has been developed and shall be presented to all people that arrive at the Project site. The orientation is considered a prerequisite to entering any of the Lower Churchill Project sites.

Project environmental orientation shall include elements of this P-WEPP such as: environmental protection procedures; proper storage and handling of materials; encounters with wildlife, rare/endangered species, historic resources, waste management, and emergency response.

Project environmental orientation shall be delivered by experienced individuals with an in depth knowledge of the P-WEPP and a knowledge of construction and execution activities.

The project environmental orientation shall include a review of the following:

- a) Environmental management;
- b) Environmental considerations;

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- c) Non-compliance and corrective actions;
- d) Environmental contingency measures;
- e) Incident reporting requirements;
- f) All permit-required work; and
- g) Construction site rules and regulations.
- h) All personnel who attend the Project Environmental Orientation session shall be required to sign an attendance sheet, and shall be provided with access to copies of the P-WEPP, or C-SEPP as appropriate, and documentation indicating the completed training and expiration dates.

3.3.2 Visitor Orientation

A temporary orientation shall be provided to those persons who have arrived at the project but will not be completing any field construction work (meetings, office work, deliveries, etc.). The visitor orientation shall cover relevant environmental protection measures, project emergency procedures, environmental incident reporting requirements, and other general project environmental requirements.

Any person, who has not taken the full orientation program, shall be supervised by a designated, oriented Project person at all times, and shall abide by the P-WEPP.

3.3.3 Contractor Orientation

Contractors may develop and deliver additional environmental orientations to their workforces, visitors, consultants and inspectors on the details of their C-SEPP, and/or corporate requirements. The Contractor orientations are subject to review and acceptance by the Environmental Engineering Manager.

3.3.4 Toolbox Meetings

Toolbox meetings (short, informal meetings) shall be held by the contractor with its field crews and supervisors at the beginning of each work shift. The tool box meeting shall involve discussion of work task assignments for the day and any associated safety hazards. These meetings shall also provide the opportunity to discuss environmental concerns and applicable mitigation measures that apply.

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4 RELEVANT LEGISLATION

There are regulatory requirements at the provincial, federal and municipal levels that apply to the design and construction of the Project. Compliance will be evaluated through a program of environmental compliance monitoring, primarily implemented by Site Environmental Monitors.

The LCP has adopted Nalcor Energy's Corporate Environmental Policy and Guiding Principles and its Environmental Management System meets the requirements of ISO 14001:2009 (Environment). As a result, environmental protection measures and mitigation associated with this Project shall meet the same high corporate standard.

All work undertaken during the design, construction and commissioning phases of this project shall be in accordance with the most recent guidelines. For a detailed discussion of the regulatory requirements for the Project see the [Regulatory Compliance Plan \(Document #. LCP-SN-CD-0000-RT-PL-0001-01\)](#).

4.1 Federal

The following federal environmental acts apply to one or more aspects of Project:

- a) Canadian Environmental Assessment Act (CEAA);
- b) Canadian Environmental Protection Act (CEPA);
- c) Species at Risk Act (SARA),
- d) Navigable Waters Protection Act (NWPA);
- e) Transportation of Dangerous Goods Act, 1992;
- f) Oceans Act;
- g) Canada Shipping Act;
- h) Migratory Bird Convention Act; and
- i) Fisheries Act.

4.2 Provincial

The following provincial acts and regulations apply to one or more aspects of the Project:

- a) Dangerous Goods Transportation Act;
- b) Endangered Species Act;

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- c) Forestry Act;
- d) Historic Resources Act;
- e) Newfoundland and Labrador Lands Act;
- f) Environmental Protection Act (EPA);
- g) Air Pollution Control Regulations, 2004
- h) Gasoline Volatility Control Regulations, 2003
- i) Pesticides Control Regulations, 2003
- j) Storage and Handling of Gasoline and Associated Products Regulations, 2003
- k) Used Oil Control Regulations, 2002
- l) Waste Diversion Regulations, 2005
- m) Waste Management Regulations, 2003
- n) Waste Material Disposal Areas, 1996
- o) Wildlife Act;
- p) Water Resources Act;
- q) Well Drilling Regulations, 2003
- r) Water Power Rental Regulations, 2003
- s) Environmental Control Water and Sewage Regulations, 2003
- t) Lower Churchill Hydroelectric Generation Project Act; and
- u) Lower Churchill Labrador Island Transmission Link Project Act

4.3 Municipal

In some areas, construction activity will take place within municipal boundaries. In these areas, local bylaws shall be complied with and permits obtained.

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5 GENERAL ENVIRONMENTAL PROTECTION PROCEDURES

In general, environmental mitigation shall be planned and designed prior to issuing proposal calls for construction contracts. Environmental mitigation plans and specifications shall be incorporated into documents provided to prospective contractors for proposal purposes.

Environmental mitigation shall be consistent with applicable standards, codes, acts and regulations and the conditions of Environmental Assessment (EA) Release.

This section contains a comprehensive suite of Environmental Protection Procedures to be used.

The procedures in this section may need to be modified in the future to address new activities, unforeseen site conditions, changes in engineering design and/or construction work methods, or new environmental performance standards. These changes will be part of the maintenance of the P-WEPP as outlined in the front of this report.

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5.1 Scheduling and Timing of Construction Activities

Construction planning is one of the most fundamental activities in the management and execution of construction projects. One of the most important factors in a large scale project is the scheduling and timing of various activities. Of primary importance will be maintenance of the Project schedule. However, sensitive time periods outlined in the section below shall be considered in Project planning where practical. Where activities are to be carried out during sensitive time periods additional mitigations shall be applied as required.

Environmental Concerns

Construction activities shall be organized so that various tasks that must be accomplished have the necessary precedence and resources required to complete the task.

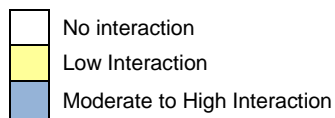
Environmental Protection Procedures

- a) A complete schedule of activities provided by the Contractor and accepted by On-Site Environmental Monitors shall be completed prior to commencement of any construction task and any restrictions on timing shall be noted on the schedule;
- b) While the ideal time of year for construction near a body of water is early June through late October, due to the low flow and low rainfall period; construction will be occurring in other times and specific attention shall be paid to ensure environmental mitigations are applied during this period;
- c) Stripping, grading, excavating and/or rehabilitation activities shall be scheduled to minimize the amount of time the soil is exposed to elements;
- d) Activities shall be conducted in such a way as to reduce the amount of time spent in or around a stream or water body;
- e) Construction activities shall be scheduled, where possible, to avoid any sensitive areas of fish and wildlife habitat and critical periods in fish and wildlife cycles. The sensitive life stages of wildlife in Labrador are illustrated in Table 5-1. These are used to identify the timing of migration, spawning and calving in the vicinity of the site, which shall be considered, where possible, in the scheduling of construction activities; and
- f) If timing is not ideal, alternative mitigations shall be implemented.

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Table 5-1: Sensitive Life History Stages of Aquatic and Terrestrial Fauna *

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Aquatic												
Brook Trout												
Quananiche												
Lake Whitefish												
Lake Trout												
Northern Pike												
Burbot												
Suckers												
Terrestrial												
Early Nesting Waterfowl												
Late Nesting Waterfowl												
Forest Avifauna												
Raptors												
Caribou												
Moose												
Semi-aquatic Furbearers												
Terrestrial Furbearers												
Black Bear												



*Table taken from Environmental Impact Statement, Lower Churchill Hydroelectric Generation Project

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5.2 Construction Entrance

Environmental Concerns

Construction entrances typically consist of a gated right-of-way and a security building, where possible. Environmental concerns include the vegetation clearing that may be required for the construction of these features, and tracking of dirt and mud from the site onto public roads and streets.

Environmental Protection Procedures

Measures to remove mud and dirt from vehicles, heavy equipment and pedestrians shall be required. Measures include rumble racks, tire washes and sediment traps.

- a) All cleaning activities should occur on a gravel pad with runoff running through a sediment trapping device prior to discharge;
- b) The gravel pad should be designed for the heaviest vehicle anticipated on site;
- c) Ensure proper cleaning of machinery/vehicles to prevent potential spread of invasive species;
- d) Ensure all site traffic use the facility and ensure the sediment trapping device is cleaned and maintained regularly; and
- e) Temporary erosion control measures shall be applied as required in the area of vegetation clearing for any gate areas or entrance buildings. See Section 5.25 for applicable control measures.

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5.3 Linear Developments

Environmental Concerns

Linear developments encompass a diverse range of standard construction related activities such as ditching, right-of-way clearing, roads and transmission line construction. Environmental concerns associated with linear developments include potential sedimentation/erosion, and the loss of vegetation and fish/wildlife habitat. Linear features can also have a negative impact on caribou beyond habitat loss.

Environmental Protection Procedures

Road Construction & Ditching

- a) Aggregate (fill) materials for construction purposes shall not be removed from any stream;
- b) Sedimentation control measures as outlined in Section 5.25, Erosion Prevention and Sediment Control shall be followed. Solids that accumulate in a settling pond or behind a sediment trap shall be removed on a regular basis to ensure such systems remain effective;
- c) Work shall not be undertaken on easily erodible materials, during or immediately following heavy rainfalls without accepted protection measures in place;
- d) Buffer zones shall be flagged prior to any disturbance activities, as required;
- e) Natural vegetation shall be left in place where possible. Rights-of-way, particularly in areas of dense vegetation, shall be as narrow as practicable; loss of ground vegetation shall be kept to a minimum;
- f) Roads shall be adequately ditched so as to allow for good drainage. Where possible ditches shall be kept at the same gradient as the road;
- g) Drainage from areas of exposed fill shall be controlled by grade or ditching and directed to vegetated areas away from all watercourses and at least 30 m from stream crossings. These drainage areas shall be determined in consultation with the On-Site Environmental Monitors;

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- h) Surface water shall be directed away from work areas by ditching. Runoff from these areas shall have sediment removed by filtration or other suitable methods as outlined in Section 5.25 and shall be directed away from wetlands and watercourses;
- i) The sediment control measures shall be determined on site by the Contractor personnel and accepted by the On -Site Environmental Monitor;
- j) Check dams shall be used as required to reduce runoff from work areas with exposed soil;
- k) In areas where natural vegetation must be removed, the topsoil layer shall be separately stored from grubbed material for rehabilitation;
- l) Cut areas through silt and clay materials shall have erosion prevention measures (Section 5.25);
- m) Temporary erosion control shall be applied on exposed slopes in sensitive areas immediately following exposure of a slope. A permanent control measure shall be installed shortly thereafter. See Section 5.25 for applicable erosion control measures;
- n) The cutting and filling phase of road construction, and the development of other work areas, shall be conducted as outlined in the following procedures:
 - i) Cutting and filling shall be done only upon completion of grubbing. Where engineering requirements do not require grubbing (e.g., within the buffer zone of a stream crossing), filling shall occur without any disturbance of the vegetation mat or the upper soil horizons;
 - ii) Filling in the vicinity of stream crossings shall be done in a manner which ensures that erosion and sedimentation of watercourses, water bodies and other ecologically sensitive areas such as wetlands is minimized and done in strict compliance with the required watercourse alteration permits from the DOEC. The hydrologic function of wetlands will be maintained;
 - iii) The infilling of watercourses and water bodies shall not be permitted except as authorized by regulatory agencies and with the approval of the

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On-Site Environmental Monitor. The On-Site Environmental Monitor shall inspect the work to ensure it is completed in compliance with the required watercourse alteration permits from the DOEC, a letter of advice from DFO (if issued) and the Authorization for Works or Undertakings Affecting Fish Habitat from DFO, if required;

- iv) Buffer zones shall be maintained between the roads and the bank of any watercourse they parallel (refer to Section 5.18); and
- v) Road fill shall be dry and ice free. On areas of sensitive terrain, excess fill shall be end-dumped from the established roadbed.
- o) Culverts shall be installed to maintain natural cross-drainage and to prevent ponding;
- p) The number of stream crossings shall be minimized. Where the road must cross a stream, the environmental protection procedures detailed in Section 5.17 shall be followed;
- q) Where possible, construction activities shall avoid areas of wildlife concentrations to prevent undue disturbance of wildlife during critical periods (See Sections 5.1, 5.32 and 5.34). If encounters with wildlife are unavoidable, then contingency plans detailed in Section 7 shall be followed;
- r) Where possible, rights-of-way shall avoid known archaeological, historical and/or spiritual sites and required buffers shall be respected (See Section 5.18). Where they cannot be avoided, the site shall be mitigated to satisfaction of Provincial Archaeological Office (PAO) prior to work proceeding. If any archaeological or historical sites are encountered (known or otherwise), all work shall cease in that area until approval to proceed has been granted by the PAO;
- s) Reference shall be made to the Guidelines for Protection of Fish Habitat in Newfoundland and Labrador, 1998; and
- t) Stake boundaries of rights-of way and road easements and all boundaries of the facility, infrastructure and borrow sites that will be developed.

Right-of-Way Clearing

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- a) All salvaged timber shall be piled at right angles to rights-of-way so as not to obstruct the access or work of others, damage vegetation or be placed within buffer zones of critical habitat;
- b) Disposal of cleared non-merchantable timber, slashing and cuttings from cleared areas shall take place through mulching and/or piling to minimize the amount of slash. No burning of materials is permitted for this project;
- c) If slash piles are to be used, they shall be piled so as not to cause unnecessary damage to vegetation outside the right-of-way. A 6.5m break in slash piles shall be made every 200m to allow for drainage and animal access. The maximum height of the piles shall not exceed 3m; and
- d) All conditions outlined under Road Construction and Ditching (above) as well as Transmission Line Development (below) that also apply to right-of-way clearing shall be adhered to.

Transmission Line Development

- a) Where feasible and applicable, untreated wood should be used. Where untreated wood is not practical, it shall be treated with pentachlorophenol (PCP), chromated copper arsenate (CCA) ammonical copper arsenate (ACA), ammoniacal copper zinc arsenate (ACZA), or copper naphthenate (CuN) only (see Section 5.13.5.1 for information regarding the use of treated wood in and around waterbodies and protected water supply areas)
- b) Access for the transmission line development shall follow the protective measures as listed above for roads and ditching;
- c) Ground travel on the transmission line shall follow existing trails and tote roads where practical. Stream crossings shall follow DFO standard operating procedures (SOP) where feasible (i.e. one time ford, clear span bridge etc.) Where the SOP cannot be adhered to, a stream survey and request for letter of advice from DFO may be required; and
- d) Construction for overhead transmission lines shall follow DFO Standard Operating Procedures.

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5.4 Winter Construction

Environmental Concerns

The principal concerns associated with winter construction are potential effects on freshwater ecosystems and water quality.

Environmental Protection Procedures

- a) Winter vehicles shall be confined to properly prepared, groomed and approved trails and to work sites;
- b) Maintenance and refuelling of vehicles shall be restricted to designated areas;
- c) Only streams or water bodies that are frozen shall be traversed, unless permits to ford are in place. (See the DFO Operational Statement for Ice Bridges and Snow Fills);
- d) Any debris or materials placed upon the ice surface of any waterbody shall be removed immediately after job completion;
- e) The ground must be frozen or a minimum 0.5 m snow cover for unfrozen ground is required for winter trails to avoid ground disturbance;
- f) All known archaeological sites shall be avoided;
- g) Snow removed for snow clearing operations shall be disposed of in areas directed by the On-Site Environmental Monitor; and
- h) Leave gaps of at least 2m in windrowed snow for ease of animal movements.

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5.5 Equipment Operation and Movement

A variety of equipment will be used on site during construction. This is a potential source of noise, air emissions, and potential leaks or spills.

Environmental Concerns

Noises associated with equipment operation and movement may negatively affect wildlife. Air emissions may have air quality implications. Accidental leaks or spills of fuel or other hazardous materials may affect soils, water, fish, vegetation and wildlife. Tracked equipment has the potential to disturb the ground around/at the site.

Environmental Protection Procedures

- a) All approvals, authorizations and permits for Project activities shall be followed;
- b) Noise control procedures shall be followed during construction (Section 5.31);
- c) All equipment shall have exhaust systems regularly inspected and mufflers shall be operating in accordance with manufacturer's recommendations;
- d) All equipment (e.g., diesel generators, etc.) shall meet the requirements of the *NL Air Pollution Control Regulations* under the *Environmental Protection Act*, as required. Diesel generators shall be registered with DOEC, as required. Refer to the guidance document for Approval of Diesel Generators (GD-PPD-061) for the registration form and guidance on completion;
- e) All equipment use during construction shall follow the environmental protection procedures outlined in this P-WEPP. In the case of an accidental event resulting from the use of equipment (e.g., a fuel spill), refer to the contingency plans in Section 7;
- f) All equipment on the Project site shall use only oils/lubricants that classify as "biodegradable" where feasible (see Section 5.13 for additional information on the use of biodegradable oils/lubricants);
- g) ATVs and tracked vehicles shall only be used where necessary. ATV use shall comply with the Motorized Snow Vehicles and All-Terrain Vehicle Regulations, 1996, the Environmental Guidelines for Stream Crossings by ATV, 1994 and the DFO Fact Sheet ATVs, Fish Habitat and You;

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- h) The use of heavy equipment in or near water courses shall be minimized and restricted;
- i) All equipment shall be regularly maintained and inspected. If problems are identified the equipment shall be taken out of service and repaired to prevent release of hydrocarbons into the environment; and
- j) Best Management Practices outlined in “Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities” (May 2005, ChemInfo Services Inc. for Environment Canada) shall be implemented to mitigate air quality effects during the site preparation and construction phase, where practical.

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5.6 Vessel Operations (Barge/Boats)

Vessel traffic during construction may be required, including barges, tugs and ocean-going barges, and marine vessels to transport equipment and supplies to the construction sites. Heavy lift vessels shall be used for some of the larger modules particularly if they are being transported on the high seas. All vessels shall meet Transport Canada Regulations and standards, under the *Canada Shipping Act*, as well as international regulations established by the International Maritime Organization (IMO).

Environmental Concerns

Project vessel traffic may at times increase vessel traffic in Goose Bay and/or Cartwright. There is a risk due to increase in vessel traffic for vessels to collide, run aground and/or sink. Such events may lead to the accidental release of fuel and other hazardous materials to the marine environment. The release of non-compliant ballast water could also introduce non-indigenous species or deleterious substances into Canadian waters.

Environmental Protection Procedures

- a) All vessel activity shall comply with the Pollutant Discharge Reporting Regulations, Regulations for Prevention of Pollution from Ships and Dangerous Chemicals and Vessel Traffic Service Zones Regulations as required under the Canada Shipping Act;
- b) All commercial vessels twenty metres or more in length entering Goose Bay shall report to the MCTS centre;
- c) The On-Site Environmental Monitors and the local public shall be advised of all particulars with regard to incoming/outgoing vessel traffic on a timely basis including updates regarding the estimated time of arrival/estimated time of departure (ETA/ETD) as advised by vessel masters;

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- d) Project vessel masters shall observe the following basic rules:
- i) Demonstrate that they have a set of safety and emergency procedures on board;
 - ii) Advise the site office of their time of departure from their port of origin and their estimated time of arrival at Happy Valley-Goose Bay or Cartwright;
 - iii) Notify the site office of their progress at sea or, if stopping at other ports enroute, update their ETA;
 - iv) Relevant Canadian Hydrographic Charts or electronic charting systems shall be on board prior to leaving their port of origin; these charts shall be kept on board at all times;
 - v) Implement best management practices designed to achieve zero discharge of oily waste while at the site and along the shipping route;
 - vi) All Project-related vessels shall have onboard adequate oil spill response equipment to handle an accidental release of product into the environment; and
 - vii) Refer to the Master Spill Response Plan (within the ERP) in the event of a spill or leak.
- e) No Project-related vessels shall discharge wastes into surrounding waters. The discharge of garbage from ships into Canadian waters and the waters of the Fishing Zones of Canada is prohibited;
- f) All crewmembers shall be familiar with emergency procedures for both life threatening and potentially polluting situations;
- g) Vessel traffic shall not encroach on the marine or land portion of the Gannet Islands Ecological Reserve;
- h) All stationary hazards, such as moored platforms or vessels, shall be clearly marked according to the *Navigable Waters Protection Act* and/or *Collision Regulations* under the *Canada Shipping Act*; and

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- i) All vessels shall comply with the Ballast Water Control and Management Regulations SOR/2006-129, under the Canada Shipping Act.

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5.7 Helicopter Traffic

Helicopter use at the Project site during construction will be required.

Environmental Concerns

Noise from the aircraft may disturb wildlife. Collisions with wildlife could result in mortality for both wildlife and humans and fuelling of helicopters may result in spills.

Environmental Protection Procedures

- a) All aircraft shall maintain an altitude of no less than 500 m from concentrations of birds or other wildlife;
- b) Flights for wildlife viewing or photography are not permitted, except when conducting wildlife surveys. Permits from the Wildlife Division are required for wildlife surveys;
- c) The On-Site Environmental Monitor shall inform all charter pilots of the P-WEPP requirements;
- d) All aircrafts shall inform the contractor of their expected arrival and departure times;
- e) Aviation fuel caches shall have approval from Service NL;
- f) The contractor shall ensure that helicopter landing areas are kept clear of equipment, materials/supplies at all times throughout the construction phase to avoid accidents or damage to the helicopter;
- g) All aircraft operators shall review marine and aviation weather forecasts prior to departure;
- h) Raptors (e.g., Bald Eagle, Osprey, Red Tailed Hawk) are known to nest within in the Project area. Under no circumstances shall nesting raptors be approached. The disturbance effects that helicopters have on nesting raptors can be detrimental for both the birds and the safety of the aircraft. All aircraft shall maintain a 300 m vertical and horizontal buffer from known active raptor nests between May 15 to August 15;
- i) Locations along the Churchill River are known as spring and fall staging areas for waterfowl. Helicopters moving through these areas during this time (typically

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May or September) shall maintain a minimum altitude of 500 m from concentrations of waterfowl; and

- j) The number of helicopter trips should be minimized to the extent feasible by combining trips or using other appropriate means of travel.

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5.8 Clearing of Vegetation

Environmental Concerns

Vegetation clearing (e.g., trees and shrubs) will be required during site preparation for work areas, laydown areas, roads, and ROWs. Environmental concerns include loss of habitat, sedimentation of watercourses, and disturbance or destruction of historic resources.

Environmental Protection Procedures

The following measures shall be implemented to reduce the potential effects of vegetation clearing:

General

- a) Cutting activities shall be limited to those areas that are required for construction of infrastructure as well as ROW clearing;
- b) Mulching of non-merchantable wood within the HVdc ROW is allowed as an option for disposal, except where piling is required for habitat enhancement, primarily in the Pine Martin Habitat areas, or otherwise directed by the Company. Clearing within water body buffer zones along the HVdc ROW will be reduced to a 3m wide travel route.
- c) All clearing shall comply with the requirements of all applicable permits, including a Commercial Cutting Permit and an Operating Permit;
- d) A cutting permit shall be obtained prior to the start of any site clearing. Clearing and tree removal shall be restricted to the minimum areas needed for the site and stockpiles;
- e) Clearing shall consist of cutting to within 15 cm or less of the ground and stockpiling of all merchantable timber; as well as the removal, piling and mulching of shrubs, debris and other non-merchantable timber in the area, as appropriate;
- f) Disposal of cleared non-merchantable timber, slash and cuttings from cleared areas shall take place through mulching and/or piling to minimize the amount of slash. No burning of materials is permitted for this project;

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- g) If slash piles are to be used, they shall be piled so as not to cause unnecessary damage to vegetation outside the right-of-way. A 6.5m break in slash piles shall be made every 200m to allow for drainage and animal access. The maximum height of the piles shall not exceed 3m;
- h) Limits of clearing shall be shown on all drawings issued for construction. Only those areas designated on drawings shall be cleared. Trees shall be blazed/flagged at intervals in advance of clearing to demarcate the limits of the work. Blazed trees shall not be felled. Clearing activities shall not remove any trees outside the authorized clearing limits;
- i) Slash and any timber shall not be permitted to enter any watercourse and shall be piled above spring flood levels;
- j) Mechanical clearing by mechanical harvesters will likely take place within the main construction areas and ROWs. For other clearing required, chain saws or other hand-held equipment may be used except where alternative methods or equipment are accepted by the On-Site Environmental Monitor;
- k) Mechanical clearing by means other than mechanical harvesting equipment (i.e. bull dozer or excavators) shall not occur;
- l) Fire fighting tools and water delivery systems must be available, as required, by the operating permit for the activity;
- m) A buffer zone of undisturbed vegetation shall be maintained between construction areas and all water bodies (See DFO Operational Statement Aquatic Vegetation Removal in Freshwater Systems), watercourses, and ecologically sensitive areas (Section 5.18), unless otherwise authorized. Buffer zone features shall be key elements of the environmental review of drawings prior to construction;
- n) Where possible, timber shall be felled inward toward the work area to avoid damaging any standing trees within the immediate work area;
- o) Workers shall not destroy or disturb any features that are indicative of a historical or archaeological site. Any such findings shall be reported immediately to the On-Site Environmental Monitor (see Sections 5.32.1 and 7.3);

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- p) Clearing activities between May 15 and July 31 shall be in compliance with the Avifauna Management Plan;
- q) No clearing shall take place within 800 m of an active raptor nest between the months of May 15 to August 15. If a nest is encountered during clearing activities, all work shall stop until the site is cleared by the On-Site Environmental Monitor, in consultation with the appropriate regulatory agencies;
- r) If a tree containing an inactive eagle or osprey nest is encountered during clearing of construction sites (other than transmission lines) , the nest shall be assessed for viability and if the nest is deemed viable a platform shall be established as approved by the provincial Wildlife Division. For other raptors such as hawks and owls, active nests will be identified as per the Avifauna Management Plan and appropriate buffers applied.; and
- s) If a tree containing an inactive raptor nest is encountered during transmission line clearing a platform will not be required as the tower will provide an alternative nesting site.
- t) Merchantable Timber
- u) Merchantable timber is defined as being 2.5 m or more in length with a top diameter not less than 9.1 cm and being of generally sound condition. Non-merchantable timber consists of all other vegetation with no merchantable value, such as small trees, shrubs, limbs and/or branches;
- v) All merchantable timber shall be salvaged. It shall be cut into standard harvesting lengths (i.e., 2.5 - 3.5 m lengths), trimmed, and stored in identified stockpile areas. Figure 5-1 for poorly cut and piled wood and Figure 5-2 shows properly cut and piled wood; and
- w) All merchantable timber within the specific clearing limits shall be stockpiled so as not to obstruct the access of work of others.

Transmission Line/Road Rights-of Way

- a) All salvaged timber shall be piled at right angles to rights-of-way so as not to obstruct the access or work of others, damage vegetation or be placed within buffer zones of critical habitat; and

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b) Slash and debris is to be disposed of as per items g) and h) of the general conditions outlined above.



Figure 5-1: Poorly cut and piled wood



Figure 5-2: Proper way to remove, cut and pile wood

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5.9 Pumps and Generators

Environmental Concerns

A variety of water pumps, hoses and generators will be in frequent use in many construction sites and at remote work camps. Environmental concerns are associated with any accidental spills or chronic leaks contaminating water bodies and soil. There may also be concerns with air emissions from generators on the site.

Environmental Protection Procedures

- a) See Section 5.18 for required buffer zones for fuel and other hazardous materials storage and handling;
- b) Drip pans shall be placed underneath pumps and generators. The drip pans shall be lined with absorbent material and shall have a cover to prevent water from entering. Absorbent material shall be kept at all sites where pumps and generators are in use;
- c) Spill kits shall accompany all pumps and generators at the site (see Section 5.13);
- d) Pumps and generators shall be located as far as practical from all waterbodies;
- e) Pumps and generators shall be located on a level, stable surface. All pumps used for freshwater supply shall have a fine mesh screen on the intake hose;
- f) Hoses and connections on equipment located near water bodies shall be inspected routinely for leaks and drips;
- g) A water use license from the Water Resources Management Division will be required for withdrawal of water from a waterbody;
- h) All diesel generators on site shall meet the requirements of the *Air Pollution Control Regulations, 2004* under the *Environmental Protection Act* as required; and
- i) All leaks shall be reported immediately to the On-Site Environmental Monitors. Upon detection of a leak, the equipment (i.e. pump, generator, etc.) shall be shut down immediately and corrective action taken to repair the leak and clean up any contaminated soil and/or water (Refer to the Master Spill Response Plan).

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5.10 Surveying

Surveying activities may include: vegetation removal; traversing; establishing targets, permanent benchmarks and transponder stations.

Environmental Concerns

Surveying activities may disturb vegetation, wildlife, and historic resources.

Environmental Protection Procedures

Vegetation Removal

- a) Vegetation removal will be scheduled to minimize disturbance to animals in sensitive areas or during sensitive time periods;
- b) Width of survey lines shall be limited to that which is absolutely necessary for line of sight and unobstructed passage;
- c) Whenever possible, cutting lines to the edge of open areas shall be avoided;
- d) Trees and shrubs shall be cut flush with the ground wherever possible with stumps not to exceed 15 cm;
- e) Cutting of survey lines shall be kept to a minimum;
- f) All survey tape used at the site shall be made of biodegradable material;
- g) All trees not exactly on transit lines shall be left standing and trees partly on line should be notched (notch not to exceed 1/3 tree's diameter) instead of removed, to allow sighting;
- h) Discretion shall be used when large trees are encountered. For example, trees 30 cm at diameter breast height (dbh) or larger should, whenever possible, not be cut. On grid lines, trees of 30 cm diameter or larger shall be left intact and shall be traversed to continue the line;
- i) Wildlife shall not be harassed or disturbed;
- j) Vehicles shall yield the right-of-way to wildlife;
- k) There shall be no cutting in areas designated as sensitive without notification of the On-Site Environmental Monitors;

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- l) Archaeological sites and features shall not be disturbed during survey work. Any historic resource discoveries shall be reported as per Section 5.32.1; and
- m) Survey crews shall have a briefing on the recognition of historic resources prior to commencing work.

Traversing

- a) ATVs shall not be allowed off the right-of-way except where acceptable to the On-Site Environmental Monitor. ATV use shall comply with the *Motorized Snow Vehicles and All-Terrain Vehicle Regulations, 1996*, the *Environmental Guidelines for Stream Crossings by ATV, 1994* and the DFO Fact Sheet *ATVs, Fish Habitat and You*;
- b) No motorized vehicles shall enter the areas designated as sensitive without notification of the On-Site Environmental Monitors;
- c) Activity within sensitive areas shall be minimized; and
- d) Walking in sensitive areas shall be restricted to established walking paths, where available.

Establishing Targets, Permanent Benchmarks and Transponder Locations

- a) A driven T-bar, embedded to readily identify each benchmark location, shall be used;
- b) Access to sensitive areas shall be accepted by the On-Site Environmental Monitors;
- c) Standard iron bars and sledgehammers shall be used to establish benchmarks; and
- d) Heavy equipment shall not be used to access sensitive areas.

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5.11 Drilling

5.11.1 Geotechnical

Drilling will be required as part of geotechnical investigations to recover soil samples, characterize the subsurface of proposed foundations, excavate areas and probe the bedrock surface. Seismic geophysical methods may also require drilling of shot holes in which small sources of energy (explosives, weight drop, air gun, etc.) are to be placed.

Environmental Concerns

The environmental concerns associated with drilling are surface disturbances, disposal of drilling fluids and cuttings, generation of dust, noise, and the potential effects on terrestrial habitats, historic resources, air quality and aquatic ecosystems.

Environmental Protection Procedures

The following mitigation measures must be followed when drilling at the site:

- a) If water withdrawal is required for drilling, a request for project review to DFO is required. If a letter of advice is issued from DFO, all conditions shall be followed. A water use license from the Water Resources Management Division is also required;
- b) Shot holes for seismic activities shall not be within 100 m of any water well, structure or buried service line;
- c) Drilling mud, together with drilling cuttings and return water, shall be treated using a polydrill filter box or suitable alternative (See Figure 5-3). Solids collected shall be disposed of at an approved waste disposal site. All treated water shall be discharged on land to the environment in a manner that will promote permeation into overburden soils and will not enter or impair water bodies. If drilling mud is required, biodegradable products such as clear-bore or an approved equivalent shall be used. The type shall be documented and MSDS provided and kept on file;

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Figure 5-3: Poly Drill Filter Box used for solids removal in drilling applications

- d) All discharges will meet the Environmental Control Water and Sewer Regulations (ECWSR).
- e) Drilling of boreholes shall be conducted in compliance with all conditions of the Exploration Approval for the work required under the *Mineral Regulations* issued under the *Mineral Act*;
- f) All drilling equipment on the Project site shall use only oils/lubricants that classify as “biodegradable” (see Section 5.13 for additional information on the use of biodegradable oils/lubricants);
- g) Due to the nature of drilling activities (quicksnaps, couplings) oil drops and leaks may occur. The area shall be cleaned up at every opportunity and all rigs shall be equipped with spill kits (as outlined in Section 5.13);
- h) In the event of a hose rupture or loss of hydraulic fluid, the Master Spill Response Plan (within the ERP) shall be followed;
- i) Abandoned drill holes shall be sealed with a cement grout bentonite mixture;
- j) If explosives are used in seismic shot holes, a blasting plan shall be reviewed with the On-Site Environmental Monitor to ensure any unexploded charges are removed from the holes prior to sealing;
- k) Drilling sites shall be cleared of vegetation following the procedures detailed in Section 5.8;
- l) Disposal of all drilling materials and associated solid wastes shall be undertaken in accordance with the procedures in Section 5.15;

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- m) Fuel shall be stored, handled and transported according to Section 5.13 and Section 5.18;
- n) Water applications shall be used to control dust. Water-based drilling dust suppression systems may require anti-freeze in winter months, which shall be approved by the DOEC. The use of water for dust control or coring/wash boring shall be undertaken in a manner that ensures return water does not enter watercourses;
- o) Drilling equipment shall have muffled exhaust to minimize noise;
- p) No person shall deposit or permit deposition of oil, oil wastes or any other substance harmful to migratory birds in any waters or any area frequented by migratory birds; and
- q) If possible, drilling will be scheduled to minimize disturbance to animals in sensitive areas during sensitive time periods.

5.11.2 Water Well

Water well drilling may be required on land during hydrogeological investigations to evaluate groundwater quality and quantity of bedrock aquifers.

Environmental Concerns

The environmental concerns associated with drilling water wells are surface disturbances, disposal of drilling fluids and cuttings, generation of dust, noise, and the potential effects on terrestrial habitats, historic resources, air quality and aquatic ecosystems.

Environmental Protection Procedures

Potential drilling sites in sensitive areas shall be confirmed by the On-Site Environmental Monitors.

- a) Drilling sites shall be cleared of vegetation following the procedures detailed in Section 5.8;
- b) Disposal of all drilling materials and associated solid wastes shall be undertaken in accordance with the procedures in Section 5.15;
- c) Fuel shall be stored, handled and transported according to Section 5.13;
- d) Drilling equipment shall have muffled exhaust to minimize generated noise; and

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- e) Drilling of water wells shall be conducted in compliance with the *Water Resources Act* and the *Well Drilling Regulations*.

5.11.3 Marine and Riverine Environment

Marine and riverine drilling may be required during geotechnical investigations to determine foundation conditions - assess stability, and underlying seabed or riverbed for Project infrastructure. Drilling shall be conducted from a barge of suitable size.

Environmental Concerns

The environmental concerns associated with this type of geotechnical drilling in a marine/riverine environment include pollution from the release of drill cuttings and other drilling related debris, fuel or other hazardous material, noise generated by drill operations, and disturbance of aquatic ecosystems (marine communities and/or individual species) caused by increased turbidity in the area proximal to the drill collar location.

Environmental Protection Procedures

- a) All drilling equipment on the Project site shall use only oils/lubricants that classify as “biodegradable” (see Section 5.13 for additional information on the use of biodegradable oils/lubricants);
- b) Potential drilling sites shall be inspected and cleared by the On-Site Environmental Monitor prior to drilling proceeding;
- c) The drill rig shall be inspected for mechanical soundness prior to mobilization to the drill site. Barges used to support drilling shall be inspected and approved prior to drill mounting onto barge. . The drill crew shall also keep a daily log of inspections and mechanical soundness of barge and drill. Daily logs shall note the general stability of the drill rig and overall assessment of the surrounding sea/river state;
- d) Following the initial inspection and prior to each drill mobilization, the drill rig and barge shall be inspected by the On-Site Environmental Monitor for potential environmental risks;
- e) All fuel, lubricants and other hydrocarbons shall be stored, handled and transported according to Section 5.13. Only necessary quantities shall be stored at the drill rig at any time;

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- f) A spill containment boom shall be deployed around the barge until it is removed from the drill site;
- g) Disposal of drilling materials and all solid wastes shall be undertaken according to Section 5.15;
- h) Drilling equipment shall have muffled exhaust to minimize noise;
- i) Turbidity from the release of drill water shall be localized to the area of the drill site and shall cease after drilling is complete. Release of suspended solids shall be frequently monitored by the On-Site Environmental Monitor;
- j) All discharges will meet the Environmental Control Water and Sewer Regulations (ECWSR).
- k) Operations shall be suspended when weather and flow conditions exceed the capabilities of the drill and moorings to operate in a safe and effective manner. Guidelines relating to drill and moorings performance capabilities shall be established by H&S Coordinators and/or On-Site Environmental Monitors in consultation with the drilling foreman;
- l) All drill workers shall be familiar with oil spill response procedures (Traffic Services Centre, Oil Spill Report – at sea or on land: 1-800-563-9089). Spill response equipment shall be on the barge at all times. All fuel spills shall be handled in accordance with the Master Spill Response Plan (within the ERP); and
- m) In the event of a spill, all drilling activity shall cease until clean up is performed. Priority in the event of a spill shall be the safety of all crewmembers.

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5.12 Surface Water and Groundwater Use

Groundwater and/or surface water may be extracted from wells or intake structures at different project areas and various construction camps.

Environmental Concerns

Environmental concerns associated with water wells include potential for saltwater intrusion, proximity to sources of contamination, and excessive drawdown at the aquifer. Environmental concerns associated with surface water use at the site include excessive removal of water and the potential effect on fish habitat.

Environmental Protection Procedures

- a) Wells shall be developed in consultation with the DOEC Water Resources Management Division to avoid areas of groundwater constraint such as potential sources of contamination (septic fields, landfills, etc.), proximity of other wells, and seawater;
- b) Water extraction rates shall be established, under approval of the Water Resources Management Division, to address concerns for drawdown or potential effects on the water table, and to ensure withdrawal from surface water bodies does not affect the natural flow regime and fish/fish habitat;
- c) Water withdrawal shall be documented in the Water Withdrawal Form (Nalcor Document # TBD);
- d) Applicable reference documents include Freshwater Intake End-of-Pipe Fish Screen Guidelines, 1995, Freshwater Intake End-of-Pipe Fish Screen Fact Sheet, Guidelines for the Protection of Freshwater Fish Habitat in Newfoundland and Labrador, 1998 and the Policy for Allocation of Water Use W.R. 88-1 (rev1995); and
- e) If water withdrawal is required, a request for project review to DFO is required. If a letter of advice is issued from DFO, all conditions shall be followed. A water use license is also required from the Water Resources Management Division.

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5.13 Storage, Handling, Use and Disposal of Fuel and Other Hazardous Materials

A variety of fuels and potentially hazardous materials will be used during Project construction activities. Gasoline, diesel fuel, grease, motor oil and hydraulic fluids are all needed for equipment. Other potentially hazardous materials, which may be routinely used, include but are not limited to:

- a) Propane;
- b) Explosives;
- c) Acetylene (i.e. welding);
- d) Oxygen
- e) Paints;
- f) Epoxies;
- g) Concrete additives;
- h) Wood Treatments
- i) Antifreeze; and
- j) Cleaners and solvents;

Environmental Concerns

The primary concern regarding the use of fuel and hazardous materials is their uncontrolled release to the environment through spillage, and the subsequent adverse effects on human health and safety, terrestrial, aquatic and marine habitat and species, soil, and groundwater quality.

Environmental Protection Procedures

5.13.1 General Practices

All fuel, hazardous and controlled product storage areas, including temporary and permanent fuelling and fuel storage facilities shall be designed in accordance with applicable codes and regulations.

The *Storage and Handling of Gasoline and Associated Products Regulations, 2003* (referred to as the "GAP Regulations") under the Environmental Protection Act controls the construction,

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operation, and registration of “storage tank systems”¹ in the province of Newfoundland and Labrador.

Information on storage tanks, storage tank systems, and equipment storage tanks proposed for use on the Project shall be provided for review. Tanks that are not already registered under GAP shall be evaluated on a case-by-case basis to determine if GAP Regulations apply. Tank registration shall be accompanied by any necessary regulatory variances.

In general, the GAP Regulations apply to all stationary storage tanks and storage tank systems except in the following cases:

- a) Tanks with capacities of 2,500 litres or less that are connected to a heating appliance;
- b) Tanks that are designed, constructed and utilized in the inherent operation of a piece of equipment. In this case, the tanks must be physically secured and dedicated to the equipment requiring the fuel for its operation; and
- c) "Mobile" tanks (e.g. tank trucks and tank truck trailers) used for temporary, stationary storage. In this case storage period must not exceed 14 days and no additional fuel can be added to the tank. There must also be a minimum of 14 days of downtime between separate storage periods and there can be no more than two, 14 day storage periods within a 12 month time frame.

Note that all provisions of the GAP Regulations, including registration, apply for all tanks associated with mobile generators.

Consideration for the design and construction of storage facilities shall include:

- a) Contracted fuel suppliers shall comply with the Lower Churchill Project’s P-WEPP. A C-SEPP shall be developed by the contractor, including contingency plans which shall require acceptance by the project. Before transporting or positioning fuel at the site the contractor shall read and accept the Master Spill Response Plan (within the ERP);

¹ The GAP Regulations defines “storage tank system” as an “... atmospheric or low pressure closed tank container and all vents, fill and withdrawal piping associated with it installed in a fixed location and includes temporary arrangement on cradles and skids”.

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- b) All fuel storage and handling shall be in compliance with *GAP Regulations*. Necessary registrations and variances shall be obtained from Service NL for storage facilities, as required;
- c) The Master Spill Response Plan (within the ERP) that contains information regarding spills of fuel and hazardous materials shall be kept on site near all fuel storage facilities (see Section 7 in addition to fuel suppliers contingency plans);
- d) Any soil contaminated by small leaks of fuel, oil or grease from equipment (including hydraulic hose ruptures and loss of fluid) shall be disposed as per policies and guidelines. For larger leaks and spills a disposal plan will be developed and submitted to regulators for approval;
- e) The *Used Oil Control Regulations* shall be used to determine requirements for the storage and disposal of used oil;
- f) All equipment on the Project site shall use only oils/lubricants² that classify as “biodegradable”³; unless demonstrated by the contractor and accepted that it is not feasible because of:
 - g) technical or performance constraints;
 - h) negative impacts on equipment warranties;
 - i) cost constraints; and/or
 - j) unavailability of biodegradable oils and lubricants.
- k) Empty drums shall be stored and backhauled to nearest receiving community, as per the WMP. Bungs shall be inspected and tightened prior to shipping;
- l) Contractors shall at all times maintain in good condition at least one spill kit dedicated to each piece of fuel-powered equipment. Each spill kit shall be located on the equipment and stored in a weather-proof container. Each spill kit shall have an absorption capacity of no less than 23 litres. Examples of acceptable spill kits with various absorption capacities are as follows:

² For example: hydraulic oil; multipurpose lubricant; chain oil; form oil; gear oil; transmission fluid; differential fluid; rust proofing; heat transfer fluids; compressor fluid; saw guide oil; electrical insulating fluid; and grease.

³ i.e. the product must be either “readily biodegradable”; or have inherent, primary biodegradability; or inherent, ultimate biodegradability, as defined by the *OECD 301 B: Ready Biodegradability Test* procedure.

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23 Litre Absorption Capacity

- One (1) 10-liter bag Oclansorb®, or equivalent;
- Two (2) 4-mil heavy duty disposal plastic bag 30" * 48";
- One (1) steel hand spade;
- Two (2) 100mm * 1200mm Sorb Sox®, or equivalent;
- Five (5) sorbent pads 3/8" * 17" * 19".

64 Litre Absorption Capacity

- One (1) 13-liter bag Oclansorb®, or equivalent;
- Ten (10) sorbent pads 3/8" * 17" * 19", or equivalent;
- Two (2) 4-mil yellow heavy duty disposal bag 30" * 48";
- One (1) steel hand spade;
- Two (2) 4" * 4' Sorb Sox®, or equivalent;
- Two (2) 4" * 8' Sorb Sox®, or equivalent;

121 Litre Absorption Capacity

- Twenty five (25) sorbent pads 3/8" * 17" * 19";
- Ten (10) 4-mil yellow heavy duty disposal bag, 30" * 48";
- One (1) 44-liter bag Oclansorb®, or equivalent;
- Eight (8) Sorb Sox® 4" * 4', or equivalent;
- Five (5) Sorb Sox® 4" * 8', or equivalent;
- Two (2) Spillows® 2" * 17" * 19", or equivalent;
- One (1) spark resistant poly-shovel;
- One (1) Sorb Sox® Boom 7" * 10', or equivalent; and
- One (1) Pair of chemical resistant gloves.

m) In addition to equipment-dedicated spill kits, the Contractor shall at all times maintain in good condition spill response caches that are accessible within 15 minutes travel of all work faces and within the immediate vicinity of fuel/hazardous materials storage areas. Each cache shall have sufficient absorption capacity for one thousand (1000) litres of fuel or hazardous liquids, and shall contain at a minimum the following:

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- Forty (40) hazardous material socks 3" * 4';
 - Twenty four (24) hazardous material socks 3" * 8';
 - Sixty (60) Sorb Sox® 4" * 4', or equivalent;
 - Sixteen (16) hazardous material pillows 18" * 18";
 - Eight (8) 44-liter bag Oclansorb®, or equivalent;
 - Eight (8) 13-liter bag Oclansorb®, or equivalent;
 - Four (4) 25-pound Qualisorb Gold #628, or equivalent;
 - One hundred (100) hazard material pads 3/8" * 17" * 19";
 - One hundred twenty (120) Hi-Point Pads (3/8" * 17" * 19"), or equivalent;
 - Four (4) Neoprene drain cover 36" * 36" * 1/8";
 - Four (4) 1-pound Container Gap Seal plugging compound;
 - Four (4) spark resistant poly-shovels;
 - Eight (8) pairs chemical resistant gloves;
 - Eight (8) pairs splash goggles;
 - Eight (8) pairs Tyvek coveralls;
 - Fifty (50) 4-mil yellow heavy duty disposal bags 30" * 48";
 - Two (2) plastic scoop and brush;
 - Eight (8) steel hand spades; and
 - Eight (8) 4-kg. Vytac ACX powder acid neutralizer with colour indicator and instructions (for battery acid spills), or equivalent;
- n) Only trained, qualified persons shall handle fuels and other hazardous materials. The Workplace Hazardous Materials Information System (WHMIS) shall be implemented to ensure proper handling and storage is achieved. Operators shall be in attendance for the duration of all fuelling operations;
- o) The Canadian Transport Emergency Centre (CANUTEC – 613-996-6666) operated by Transport Canada can assist emergency response personnel in handling dangerous goods emergencies.
- p) Waste oils, lubricants, and other used oil shall be reused, recycled or disposed of at an approved, licensed waste management facility in accordance with the

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WMP (as per the *Used Oil Control Regulations, 2002* and the *Air Pollution Control Regulations, 2004*);

- q) Storage areas shall be equipped with firefighting equipment, in accordance with approvals;
- r) Smoking shall be prohibited within 50 m of a fuel storage area; and
- s) See Section 5.18 for specific information related to buffer zones required for fuel storage, equipment fuelling and fuel transfer activities.

5.13.2 Fuel Storage Requirements

- a) Fuel storage tanks shall comply with *GAP Regulations* and shall be equipped with vacuum gauges and vent pipes, as applicable.
- b) Waste oil storage tanks shall comply with the *Used Oil Control Regulations, 2002* (see Figure 5-4 for a typical waste oil tank);
- c) All bulk fuel and waste oil storage (> 2000 L) shall be in tanks with suitable secondary containment (i.e. double walled, self dyked, lined, earthen dyke etc.);



Figure 5-4: Typical waste oil tank featuring vacuum gauges, vent pipe, etc.

- d) Diesel fuel and gasoline to be used for refuelling purposes shall be stored in appropriate 20L containers (i.e. yellow containers for diesel, red containers for gasoline). Containers shall be clearly identified stating container contents;
- e) A letter of consent shall be obtained from designated officials of the Service NL for fuel caches of 10 or more 205L drums (including helicopter fuel caches). A letter of consent is not required for fuel caches under 10 drums;

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- f) A marker stake or flag shall be required for a petroleum products storage site of less than 10 x 205L drums;
- g) Boundary poles or posts with colourful flags or a painted marker shall be required for temporary petroleum product sites of 10 to 100 x 205L drums;
- h) Fuels stored inside dykes or self-dyked units shall be clearly marked to ensure they are not damaged by moving vehicles and are visible under all weather conditions. Dykes and barriers shall be designed and constructed in accordance with the *GAP Regulations* (see Figures 5-5 and 5-6 for typical dyked and concrete pad methods for tank installation);
- i) Used oil shall be stored in an appropriate storage tank meeting the requirement of Section 18 and 21 of the *Used Oil Control Regulations*;
- j) Used oil can be stored in a 205L drum as long as the drum is:
 - k) clearly marked "used oil";
 - l) made of 18 gauge steel;
 - m) stored in an area providing secondary containment;
 - n) equipped with sufficient size openings to prevent spillage during filling or emptying;
 - o) equipped with venting if they are intended to be vacuumed out; and
 - p) in compliance with CAN/GSSB-43.150-95 if they are to be transported by road.
- q) All used oil tanks shall be inspected on a regular basis as per Section 24 of the *Used Oil Control Regulation*. All fuel storage tank systems shall be inspected on a regular basis as per Sections 20 and 21 of the *GAP Regulations*. This involves, but is not limited to, gauging or dipping and the keeping of reconciliation records for the duration of the program.

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Figure 5-5: Acceptable fuel storage with dykes



Figure 5-6: Fuel storage on concrete pad

5.13.3 Fuel Transfer

The following procedures shall apply to the transfer of fuel or hazardous material:

- a) In all cases, a qualified person shall attend the transfer to storage tanks, for the duration of the operation. This person shall be trained in proper fuel handling procedures to minimize the risk of a spill. The attendant shall be trained in the requirements of the fuel suppliers approved Spill Contingency Plan, Master Spill Response Plan (MSRP) and WHMIS;
- b) Hoses or pipes used for fuel transfer shall be equipped with properly functioning and approved check valves, spaced to prevent backflow of fuel in the case of failures;
- c) All tanks shall be dipped before and after filling;
- d) Fuel transfers between ship and shore or between ships shall be conducted in accordance with the *Canada Shipping Act, Oil Pollution Prevention Regulations*;
- e) Exposed pipelines shall be protected from vehicular collision damage by the installation of guardrails; and
- f) Exposed “ship to shore” fuel transfer lines shall be clearly flagged from the shoreline to the receiving fuel tank to prevent traffic collision during transfer operations.

5.13.4 Equipment Fuelling and Lubrication

The following procedures shall apply to the fuelling of heavy construction equipment:

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- a) Fuelling and lubrication of equipment shall occur in such a manner as to minimize the possibility of contamination to soil or water;
- b) When refuelling equipment, operators shall:
 - Use leak-free containers and reinforced rip and puncture-proof hoses and nozzles;
 - Be in attendance for the duration of the operation; and
 - Seal all storage container outlets except the outlet currently in use.
- c) Regular inspections shall be performed on the hydraulic and fuel systems of machinery. Leaks shall be repaired immediately;
- d) Fuelling or servicing of mobile equipment on land shall not be allowed within 30 m of watercourses or waterbodies, except in designated areas with dewatering pumps; and
- e) Fuelling attendants shall be trained in the requirements under the contractors Spill Contingency Plan in the C-SEPP and the MSRP.

5.13.5 Hazardous Materials

The following procedures shall apply to the use of hazardous materials:

- a) Hazardous materials shall be used only by personnel who are trained and qualified in the handling of these materials and only in accordance with manufacturers' instructions and government regulations. WHMIS and the provisions of the *Transportation of Dangerous Goods Act* shall be implemented throughout the job site. All employees involved with hazardous materials shall be appropriately trained;
- b) All hazardous wastes shall be stored, removed and disposed of in accordance with the WMP (as per government regulations and applicable permits);
- c) Material Safety Data Sheets (MSDS) must be available on-site prior to receipt of any hazardous materials;
- d) A hazardous waste storage area shall be constructed and properly marked. A permit may be required for construction of this area; and

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- e) Hazardous waste shall not be permitted to be poured down drains, oil/water separators, septic systems or discharged into the environment in any form.

5.13.5.1 Wood Treatment

The following standards shall apply to the use of wood preservatives on the site:

- a) Creosote shall not be used on the site.
- b) In Protected Water Supply Areas:
 - i. Treated wood products shall not be used in protected water supply areas;
 - ii. Where written justification for treated wood is presented, for the use in protected water supply areas, for acceptance, the treatment options shall be restricted to chromated copper arsenate (CCA), ammonical copper arsenate (ACA), ammoniacal copper zinc arsenate (ACZA), pentachlorophenol (PCP), or copper naphthenate (CuN);
 - iii. Table 5-2 below specifies the required buffer zones separating water bodies (within protected water supply areas) from locations where treated wood products, including poles, are to be used;

Table 5-2: Buffer Zones for Placement of Treated Wood within a Water Supply Area

Body of Water	Width of Buffer Zone
Pond/Lake	150 m (for pond/lake intake structures)
River	150 m for a distance of 1 km upstream and 100 m downstream of river intake structures
Main River Channel	75 m
Major Tributaries/Lakes/Ponds	50 m
Other bodies of water	30 m

- iv. If structures are required within these specified buffer zones, then only untreated wood, steel or concrete shall be used; and
- v. If wood poles are required within the buffer zones outlined in Table 1, but untreated wood poles are not practical or feasible, alternative protective measures may be used however, regulatory approval for such alternative measures shall be required. Specific techniques used to eliminate or minimize environmental disturbance shall be applied as appropriate.

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- c) Saltwater and Freshwater Areas (other than Protected Water Supply Areas):
- i. In areas of low water hardness (i.e., 15-25 mg/L-1 CaCO₃), pH 5.5 or less, and elevated background metals levels, or areas where metals-sensitive biota exist, ACA, ACZA and CCA shall not be used;
 - ii. Pentachlorophenol shall not be used in salt water environments;
 - iii. For temporary installation of wood structures (i.e. bridge abutments or wood poles) within 15 metres of a water body only untreated timber shall be used;
 - iv. For permanent installations, non-invasive materials such as concrete or steel shall be used;
 - v. If use of untreated wood or alternative materials is not feasible or practical, approval by regulators is required prior to use of CCA, ACA, PCP and CuN; and
 - vi. Protective measures outlined above under Protected Water Supply Areas shall be considered; however, using these alternatives requires preapproval by regulatory agencies.

5.13.6 Spills and Leaks of Fuel and Hazardous Materials

The following procedures shall apply to the Spills of Fuel and Hazardous Materials:

- a) All necessary precautions shall be implemented to prevent the spillage and leakage of fuels and other hazardous materials used during the construction phase;
- b) All spills of fuel and hazardous materials shall be reported immediately to the On-Site Environmental Monitor. In the event of a spill refer to the Master Spill Response Plan (within the ERP); and
- c) A copy of the Master Spill Response Plan (within the ERP) shall be present on site. In the event of a spill the outlined procedures shall be followed.

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5.14 Sewage Disposal

All sewage disposal activities shall comply with Newfoundland and Labrador's Health and Community Services Act, 1997 and the Environmental Control Water and Sewage Regulations, 2003 under the Water Resources Act, 2003.

Environmental Concerns

The accidental release of untreated sewage is a concern to human health, drinking water quality, and freshwater and marine ecosystems. This applies to effluent from a sewage treatment system that does not meet the limit set in Schedule A of the *Environmental Control Water and Sewage Regulations, 2003*.

Environmental Protection Procedures

- a) Development of sewage treatment facilities shall be undertaken in consultation with the relevant regulatory agencies for a temporary or permanent sewage collection system, and a Certificate of Approval shall be obtained from the Service NL and/or the DOEC;
- b) The health inspector with the Service NL is the approval authority for sewage flows under 1000 gallons. The general sanitization of the site is under the jurisdiction of the health inspector who shall perform periodic inspections;
- c) All sewage disposal activities shall comply with Section 36(3) of the Fisheries Act.
- d) For septic systems, the location of a tile field shall be clearly marked and vehicular traffic shall not be permitted to operate within this defined boundary; and
- e) Portable washrooms and toilets used at any Lower Churchill Project site shall be routinely inspected and properly maintained by their owners or by the Project as determined by the WMP. Sewage sludge removed from the facilities shall be transported off site for approved treatment and disposal. Companies engaged to perform this work must have approval from the Service NL and/or DOEC. Copies of government approvals must be provided to the On-Site Environmental Monitor before work can proceed. All human sanitary waste must be contained and disposed in a manner that meets all environmental and health

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requirements. Any concerns must be brought to the immediate attention of the On-Site Environmental Monitors and H&S Coordinator.

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5.15 Solid Waste Disposal

Environmental Concerns

Solid waste (e.g. construction waste, domestic waste, paper, cardboard, and wood), if not properly controlled and disposed of, can be unsightly, may cause human safety and health concerns, and could negatively affect wildlife.

Environmental Protection Procedures

- a) A Waste Management Plan (WMP) is in place to address waste generation, handling, storage and disposal during construction. The WMP includes methods for waste stream separation, collection, storage, transport, disposal and associated schedules. Any procedures or strategies for management of solid waste shall also be in accordance with the Provincial Waste Management Strategy;
- b) Waste management at all sites shall comply with all provisions of the WMP;
- c) Waste material shall not be deposited in a body of water; and
- d) Waste material shall not be deposited anywhere except at a facility or site approved to accept that specific type of waste.

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5.16 Working within 15 Metres of a Body of Water

Environmental Concerns

Working close to water bodies poses a risk of introducing contaminants into the aquatic ecosystem, affecting fish, fish habitat, and other receptors, and affecting the natural flow regime of the water body. Contaminants such as sediment, petroleum hydrocarbons, and other deleterious substances may impact fish, wildlife, plants, and human receptors. Proper protection plans are required to minimize or eliminate sedimentation and water pollution and maintain riparian habitat near water bodies.

Environmental Protection Procedures

Mitigation measures provided in various sections (e.g. Section 5.25 - Erosion Prevention and Sediment Control, Section 5.13 - Storage, Handling and Disposal of Fuel and Other Hazardous Material, Section 5.18 - Buffer Zones, etc) shall be consulted to ensure that appropriate measures are understood and implemented during the course of construction. Work within 15m of a body of water requires a permit under section 48 of the *Water Resources Act*.

In addition, the following steps shall be taken to ensure protection of water bodies:

- a) A joint engineering and environmental reconnaissance of the site shall be completed in the early planning stages to identify all nearby bodies of water and mitigation and protective measures shall be identified;
- b) Where possible, the majority of construction works shall take place during low flow and low rainfall period;
- c) Any vehicles or equipment working near a body of water shall be clean and in good condition;
- d) Heavy equipment shall be kept outside the high water mark of all bodies of water, where possible; and
- e) All equipment on the Project site shall use only oils/lubricants that classify as “biodegradable” where feasible (see Section 5.13 for additional information on the use of biodegradable oils/lubricants).

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5.17 Watercourse Crossings – Fording, Culverts and Bridges

Environmental Concerns

The environmental concerns associated with fording, culvert installations, bridge construction and maintenance include direct disturbance to, or mortality of, fish, disturbance to waterfowl, loss of fish habitat caused by sedimentation and removal of substrate, and disturbances to stream bank vegetation.

Environmental Protection Procedures

Erosion stabilization methods and effective sedimentation control practices shall be implemented when required (Section 5.25), and these shall conform to requirements, guidelines, and principles contained in DFO Factsheets, Operational Statements, DOEC Environmental Guidelines, and specific requirements of regulatory permits and approvals.

All watercourse crossings (fording, culvert installation and bridge crossings) shall comply with permits issued by DOEC. In addition, a notification form or a request for project review to DFO are required. If a letter of advice is issued for Works and Undertakings Affecting Fish Habitat from DFO, all conditions shall be followed.

The following measures shall be implemented to minimize negative effects of watercourse crossings:

- a) Attention shall be given to scheduling in order to minimize the time the watercourse is disturbed and therefore minimize the sediment entering the watercourse. The ideal time for construction is during low flow and low rainfall period;
- b) Any alterations to a body of water which may impact navigation shall require a Navigable Waters Permit Application under *Navigable Waters Protection Act (NWPA)* request for project review under NWPA from Transport Canada (TC). If a NWPA authorization is issued, the conditions shall be adhered to;
- c) Any alterations to a body of water which may impact water quality shall require a DOEC permit(s) under the *Water Resources Act*;
- d) Watercourse crossing construction activities, in areas of fish habitat, shall be undertaken in accordance with DFO requirements and under the direct guidance of the On-Site Environmental Monitor;

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- e) All water courses and bodies of water shall be examined by the On-Site Environmental Monitor or sub-contractors on a site-specific basis in order to evaluate each watercourse crossing (including upstream and downstream);
- f) Work shall be performed in such a way as to ensure that materials such as sediment, fuel and oil do not enter watercourses and water bodies;
- g) The banks and flood plains of watercourses must be adequately protected from erosion using an applicable erosion prevention method as outlined in Section 5.25, Erosion Prevention and Sediment Control;
- h) A suitable buffer (Section 5.18) of undisturbed natural vegetation shall be left between the access road and the bank of any adjacent watercourse, unless otherwise specified. The typical buffer width shall be determined in consultation with the On-Site Environmental Monitor according to the following formula:

$$\text{Buffer width (m)} = 20 \text{ m} + 1.5 \times \text{slope (\%)} \text{ (where slope } >30\%);$$
- i) See Section 5.18 for buffer widths related to temporary fuelling services or washing of equipment near watercourses or waterbodies.

Fording

When fording any watercourse, the DOEC Environmental Guidelines for Fording and the DFO fact sheet for Temporary Fording Sites shall be followed in conjunction with the following:

- a) Areas of known or suspected spawning habitat shall be avoided;
- b) Where feasible, crossings shall be restricted to a single location and made at right angles to the watercourse;
- c) Equipment activity within the watercourse shall be minimized by limiting the number of crossings;
- d) All equipment shall be clean and mechanically sound to avoid the introduction of oil, gasoline, and hydraulic fluids to waterbodies;
- e) No servicing or washing of heavy equipment shall occur adjacent to a watercourse, waterbody, or ecologically sensitive area. These areas will be identified on constraint mapping and will be identified in the field by the On-Site Environmental Monitor;

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- f) Where the ford area is not natural bedrock or is easily disturbed by fording, the entire fording area shall be stabilized using vegetation mats, corduroy roads or coarse material (125 mm diameter or greater) when such material is available from a reasonably close location within the right-of-way; when the substrate of the ford area is not subject to easy disturbance by fording or coarse material is not easily available within the right-of-way, fording under existing substrate conditions may occur under the guidance of the On-Site Environmental Monitor;
- g) Fording activities shall not decrease the depth of the watercourses to less than 20 cm. Where the existing depth is less than 20 cm, that depth shall be maintained;
- h) Photographs of all ford sites will be taken prior to and after the fording has been completed. The On-Site Environmental Monitor shall be responsible for collecting these photographs;
- i) Waterbodies shall not be forded during high flow periods;
- j) All bank sections which contain erodible materials shall be stabilized or avoided if possible; if banks must be sloped for stabilization, no material shall be deposited within the watercourse; sloping shall be accomplished by back-blading and the material shall be deposited above the high water mark of the watercourse; and
- k) Proposed fording activities on waterbodies or water courses visible on 1:50,000 scale maps shall require a permit from DOEC.

Culverts

In those locations where installations or upgrading of existing culverts are required, permits are required from DOEC. In addition a request for project review to DFO may be required. If a letter of advice is issued from DFO, all conditions shall be followed;

The culverts used shall be sized to handle the 1-in-100 year return period flood (however design criteria may vary depending on site-specific conditions and the length of time a culvert will be used (i.e. temporary vs. permanent)) and shall be constructed in accordance with the DOEC Environmental Guidelines for Watercourse Crossings and Culverts and the DFO operational statement for Culvert Maintenance as well as the DFO fact sheets for Culvert Installations. The following measures shall also be implemented:

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Installation of Culverts

- a) Install culvert(s) in accordance with good engineering and environmental practice. Photographs of culvert installation are shown as Figures 5-7 and 5-8;
- b) Proposed culvert installations on water courses visible on a 1:50,000 scale map shall require a permit from DOEC;
- c) Unless otherwise indicated, all work shall take place in dry conditions, either by the use of cofferdams or by diverting the stream with pumps and hoses. All work involving major alterations to stream channels shall be carried out at a time of low flow, in a manner that prevents downstream sedimentation;
- d) Cylindrical culverts shall be counter sunk when installed in fish habitat (as recommended by DFO) such that the culvert bottom is one-third the diameter below the streambed in the case of culverts less than 750 mm outside diameter; for culverts greater than 750 mm outside diameter, the culvert bottom shall be installed a minimum of 300 mm below the streambed;
- e) If two culverts are to be installed at one location, one culvert shall be installed at an elevation lower than the other one. A maximum of two culverts are allowed at one location;
- f) The natural low flow regime of the watercourse shall not be altered; culverts shall not disrupt flow of water or cause ponding at the upstream side of the installation;
- g) A culvert shall not be installed before site-specific information such as localized stream gradient, fish habitat type and species present have been evaluated, as required;
- h) Photographs of all culvert installations will be taken prior to and after the installation has been completed. The On-Site Environmental Monitor shall be responsible for collecting these photographs;
- i) Inlet and outlet areas shall be adequately protected from erosion by installing erosion prevention structures as outlined in Section 5.25, Erosion Prevention and Sediment Control;

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- j) When rock energy dissipaters are utilized at culvert outlets, proper fish passage must be ensured;
- k) Culverts shall be of sufficient length to extend a short distance beyond the toe of the fill material;
- l) Backfill material shall be of texture that shall support the culvert and limit seepage and subsequent washing out;
- m) Culverts shall be aligned such that the original direction of stream flow is not significantly altered and the gradient at the culvert follows the stream channel gradient to the extent possible. Infilling or reduction of the natural cross-sectional area of the watercourse shall not be permitted;
- n) Fill and construction debris shall be removed from the culvert area to a location above the peak flow level to prevent its entry into the watercourse;
- o) Construction activity shall be confined to the immediate area of the culvert;
- p) Fill material shall not be removed from streambeds or banks except when removal of material is necessary to ensure a flat foundation for installing a culvert;
- q) The use of heavy equipment in watercourses or bodies of water shall not be permitted;
- r) Culverts shall be marked to indicate their position under the snow;
- s) As required, cofferdams of non-erodible material shall be installed above and below work areas to separate them from the watercourse when excavating for culverts and footings. All sandbags used in construction must be accounted for and removed after work is completed. Where pumping is used to bypass flow, pumps shall have sufficient capacity to prevent washout of the cofferdams. Refer to DFOs fact sheet for Instream Work in the Dry – Cofferdams;
- t) Cofferdams shall be removed upon completion of construction and the streambed returned as closely as possible to its original condition;
- u) Water pumped from work areas or other runoff must have sediment and turbidity removed by settling ponds, filtration, or other suitable means before discharging to a waterbody;

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- v) The release of sediment laden water into a waterbody, watercourse or ecologically sensitive area, due to construction activities, shall comply with applicable discharge guidelines as presented in the *Newfoundland and Labrador Environmental Control Water and Sewage Regulations, 2003* under the *Water Resources Act*;
- w) With respect to maintenance of water quality within receiving waterbodies on and around the site, the *CCME Canadian Water Quality Guidelines for the Protection of Aquatic Life* shall be used; and
- x) Culvert installations shall not require a DFO review when the following conditions are met (unless the culvert installations are within fish habitat):
 - y) the work does not include realigning the watercourse, installing a culvert liner or support struts, replacing damaged or destroyed bevels ends, or extending/replacing the existing culvert;
 - z) explosives are not used to remove debris; and
 - aa) the work does not include any dredging, infilling (e.g., filling scour pools) or excavation of the channel upstream or downstream of the culvert.

Culvert Upgrading/Maintenance

Culvert maintenance includes the removal of accumulated debris (e.g., logs, boulders, garbage, ice build-up) that prevents the efficient passage of water and fish through the structure and well as reinforcement of eroding inlets and outlets. The following measures shall be implemented when upgrading/maintaining culverts:

- a) In locations where upgrading and/or alterations are required for existing culvert at the site, the mitigation measures listed above for installation of a culvert shall be reviewed and followed, as applicable;
- b) Culverts shall be inspected regularly so that immediate action can be taken to clear blockages caused by ice or debris and to identify any apparent problems, such as erosion, which may require remedial action;
- c) An inspection of culverts shall be made during and after major floods to observe the culvert operation and record high water marks. Conditions which require corrective maintenance shall be noted including debris accumulations,

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sedimentation, erosion, piping, scour, and structural damage and reported if applicable;

- d) Culverts which have been damaged by ice or debris, by improper installation or construction procedures, or are in a condition which could impair their proper functioning shall be replaced immediately to prevent overtopping, erosion, or flooding; and
- e) Access for maintenance shall be provided, especially where debris control structures are installed. Such access shall not disrupt the site rehabilitation efforts.



Figure 5-7: Example of well installed culvert



Figure 5-8: Example of culvert installation

Bridges

- f) Environmental protection measures outlined above which are applicable to bridge construction and maintenance shall be adhered to;
- g) Any proposed bridge installations require a permit from DOEC. In addition, a request for project review or project notification to DFO is required. If a letter of advice is issued from DFO, all conditions shall be followed;
- h) Photographs of all bridge installations shall be taken prior to and after the installation has been completed. The On-Site Environmental Monitor shall be responsible for collecting these photographs;

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- i) During bridge construction all applicable guidelines shall be adhered to including but not limited to: DOEC Environmental Guidelines for Bridges and Watercourse Crossings, DFO Clear Span Bridges Operational Statement, DFO Fact Sheet for Temporary Bridges, and DFO Fact Sheet for Bridge Construction/Demolition;
- j) To safely convey peak flows, permanent bridges shall be designed for a 100-year return period stream flow;
- k) Temporary bridges shall consider the following basic design criteria:
 - l) Hydraulic design shall be based on the 1:2 year storm event;
 - m) Abutment logs shall be placed a minimum of 1 meter from the top of the bank;
 - n) Deck height shall be a minimum of 250 cm above the bank height; and
 - o) Deck height shall be a minimum of 450 cm above the water surface at the time of installation.
- p) Each installation shall take into consideration site-specific conditions and appropriate criteria shall be accepted by the On-Site Environmental Monitor;
- q) The upstream and downstream sides of abutments must be protected with erosion prevention structures as outlined in Section 5.25, Erosion Prevention and Sediment Control, to prevent erosion and scouring;
- r) Roadside embankments near the watercourse shall be adequately protected from erosion by installing applicable erosion prevention structures as outlined in Section 5.25;
- s) Adequate erosion protection as per Section 5.25 Erosion Prevention and Sediment Control shall be provided where roadside ditches discharge into the watercourse near the bridge;
- t) Abutments and piers shall be constructed in the dry and where possible during times of low flow;
- u) During construction of concrete components, formwork shall be constructed to prevent any fresh concrete from entering bodies of water. Dumping of concrete or washing of tools and equipment in any body of water is prohibited;

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- v) Periodic maintenance such as painting, resurfacing, clearing of debris, or minor repairs, shall be carried out without causing any physical disruption of the watercourse. Care shall be taken to prevent spillage of pollutants into the water;
- w) All waste materials shall be disposed of in accordance with the WMP;
- x) All areas affected shall be returned to a state that resembles local natural conditions; and
- y) During rehabilitation activities following the end of construction, all temporary bridges shall be removed.

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5.18 Buffer Zones

Environmental Concerns

The potential for erosion/sedimentation, spills, etc. and resulting effects on water quality, fish and fish habitat is a key environmental concern associated with construction activities. In addition, sensitive and rare environmental receptors (e.g. Osprey nesting sites, archaeological/historic resources, etc) require protection from activities associated with construction.

Buffer zones of natural vegetation or undisturbed areas that separate these environmental receptors from construction activities are needed to mitigate adverse environmental effects. These undisturbed areas may also provide wildlife habitat and/or travel corridors near work areas and Project features.

Due to the many buffer zones referenced in various government documents and others that may be stated in regulatory permits yet to be obtained, the appropriate buffer zone to use in a specific area may vary over time. Therefore, the On-Site Environmental Monitor shall be the only site-based personnel to determine which buffer is applicable, and contractors shall be required to consult with these individuals prior to establishing buffers. For general guidance, however, the following procedures shall define the minimum requirements during construction.

Environmental Protection Procedures

- a) DFO recommends buffer zones to separate areas of land disturbance/roadways from water bodies shall be calculated by the following formula:

$$\text{Buffer Width (m)} = 20 \text{ m} + 1.5 \times \text{slope (\%)} \text{ (where slope } > 30\%);$$

- b) A minimum buffer zone of natural vegetation 20 m from the high water mark of waterbodies, watercourses and ecologically sensitive areas shall be maintained around work areas where available space poses a constraint, except where specified otherwise. If the available space allows, then wider buffer zones of 100 m shall be maintained between construction areas and watercourses, waterbodies and ecologically sensitive areas (Figure 5-9 shows a typical buffer zone being protected by tarp fencing);

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Figure 5-9: Tarp fence outlining a vegetation buffer zone

- c) Sediment control devices shall be constructed outside buffer zones as required. This is required to control runoff from areas of exposed soils and prevent transport of sediments towards water bodies. Section 5.25, Erosion Prevention and Sediment Control outlines all acceptable sediment control measures;
- d) All aircraft must maintain a 300 m vertical and horizontal buffer from known active raptor nests between May 15 to August 15;
- e) No clearing shall take place within 800m of an active raptor nest between the months of May 15 to August 15;
- f) For all work activities other than clearing, a 200 m buffer shall be respected for active raptor nests from May 15 to August 15. Within this 200 m buffer zone the following applies, after consultation with the provincial government:
 - i) Only essential vehicular activity shall be permitted;
 - ii) Work shall only be permitted in the presence of the On-Site Environmental Monitor; and
 - iii) Crews shall cease work if there is a disturbance at a nest until activity at the nest has returned to normal; work shall not commence again until approval from the On-Site Environmental Monitor.

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- g) Crews shall not establish a permanent or temporary camp within 800 m of a known raptor nest;
- h) Locations along the Churchill River are known as spring and fall staging areas for waterfowl and harlequin ducks. Helicopters moving through these areas during this time (typically May or September) shall maintain a minimum altitude of 500 m from concentrations of waterfowl and harlequin ducks;
- i) For known harlequin duck nesting areas, a 100 m buffer of natural vegetation shall be maintained along the river's edge during their breeding, nesting and staging times (May through September). A 30 m buffer shall be maintained outside the sensitive nesting season. Clearing and construction within these buffers during the specified times shall not occur unless otherwise authorized;
- j) Buffer zones for other bird species not indicated in this document are outlined in the Avifauna Management Plan and shall be respected;
- k) A minimum buffer zone of 100 m shall be maintained from the high water mark of waterbodies, watercourses and ecologically sensitive areas around any bulk fuel storage activities;
- l) The typical buffer zone for quarries and borrow pits in relation to a water body is 100 m. In some instances the development of quarries and borrow pits shall be allowed within this 100 m buffer zone, however applicable permits from regulators shall be required, as well as consultation with the On-Site Environmental Co-ordinator;
- m) A minimum buffer zone of 50 m shall be maintained around any archaeological site. The size of buffer zones may increase or decrease depending on the type of site and the buffer zone will be determined by the Provincial Archaeology Office (PAO). Where the site has been designated for recovery and/or recording the buffer zone shall be maintained until it has been cleared by the On-Site Environmental Monitor. Where available space poses constraints, this width may be reduced and supplemented by other protective measures. Site-specific mitigative measures for known historic resources in the Project area are addressed within Section 5.32.1;
- n) Buffers for working around caribou are outlined in Section 5.32.3; and

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o) Figure 5-10 provides a summary of recommended buffer zones for the handling and storage of fuels and other hazardous products. Table 5-3 provides a summary of all buffer zones.

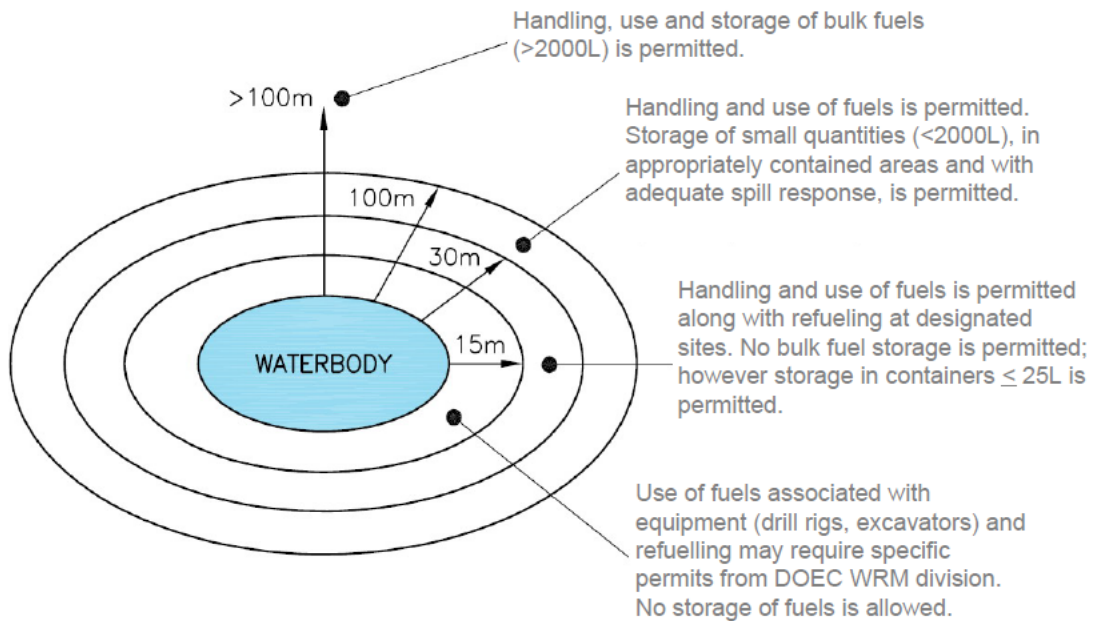


Figure 5-10: Required Buffer Zones from a water body (for fuel activities)

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Table 5-3: Recommended Buffer Strips for Various Activities

Activity	Environmental Receptor	Recommended Width (m) of Buffer Strip
Handling, use and storage of bulk fuels (> 2000L)	Waterbody	100 m
Storage and handling of small quantities (<2000L) of fuel in appropriately contained areas and with adequate spill response	Water body	30 m
Handling and use of fuels (including transfer and fuelling of equipment). Storage of fuel in containers ≤25L	Waterbody	15 m
Linear Developments/ Clearing of Vegetation	Waterbody	20 m (+1.5 x slope (%) where >30%)
	Active Raptor Nests	800 m (between May 15 – August 15)
Other Work Activities	Active Raptor Nests	200 m (between May 15 – August 15)
Aircrafts	Active Raptor Nests	300 m (vertical and horizontal)
	Waterfowl and Harlequin Duck Concentrations	500 m vertical distance
Quarrying and Aggregate Removal from Borrow Areas	Waterbody	100 m
All Activities	Archaeological sites	50 m*
Cutting	Scheduled Salmon Rivers	50 m*

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Activity	Environmental Receptor	Recommended Width (m) of Buffer Strip
Cutting	Black Bear Denning Sites (Late October – Late April)	50 m*
Cutting/Construction	Harlequin Duck	100 m* during nesting, breeding and molting seasons (Early May through September) 30 m* outside the sensitive time
Cutting/Construction	Active waterfowl/waterbird nests (species not of management concern)	100 m
Cutting/Construction	Active passerine nests (species not of management concern)	30 m
Cutting	Waterbody occupied by a beaver	30 m*

*** Buffer zone widths may vary once cutting permits are obtained.**

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5.19 Alterations to a Body of Water/ instream works

Environmental Concerns

The environmental concerns associated with alterations to a body of water include direct disturbance to, or mortality of, fish, disturbance to waterfowl, loss of fish habitat caused by sedimentation and removal of substrate, and disturbance to stream bank vegetation. Typical alterations to a body of water include fording, bridges and culverts however other less common alterations include cofferdams, pumping and stream diversions. Fording, bridges and culverts have been discussed in previous sections therefore this section shall concentrate on cofferdams, pumping and stream diversions.

Environmental Protection Procedures

- a) Any work within 15m of a water body visible on a 1:50,000 scale map shall require a permit from DOEC. A request for project review shall be submitted to DFO. If a letter of advice is issued by DFO, the conditions of the letter shall be adhered to;
- b) Erosion stabilization methods and effective sedimentation control practices shall be implemented when required, and these shall conform to requirements, guidelines, and principles contained in DFO Factsheets, Operational Statements, DOEC Environmental Guidelines and specific requirements of regulatory permits and approvals;
- c) Two cofferdams or a square type structure shall be used for best results. The first cofferdam shall be upstream of the construction area and shall keep the construction area dry and provide a basin for water to be pumped. The second cofferdam shall be downstream of the construction area and shall prevent any sediment laden water that may have accumulated in the construction area from discharging directly into the watercourse;
- d) Pumping the water shall commence prior to starting intrusive work to prevent the river from being silted as water passes the work area. When a watercourse is too large to divert by other measures, part of the river may be blocked off to allow work to take place in dry conditions. One third the width of the watercourse or less shall be blocked at any time in order to ensure efficient

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remaining capacity in the channel to safely accommodate flow without causing excessive high velocity, erosion or overtopping of banks. A dewatering plan shall be developed prior to dewatering activities;

- e) An alternative means of isolating the work area shall be to construct a temporary diversion channel lined with plastic sheeting or an impermeable material. The channel shall be designed to handle the predicted flows of the watercourse. Figure 5-11 shows typical cofferdam usage in a river and Figure 5-12 illustrates the usage of a stream diversion coupled with cofferdams;

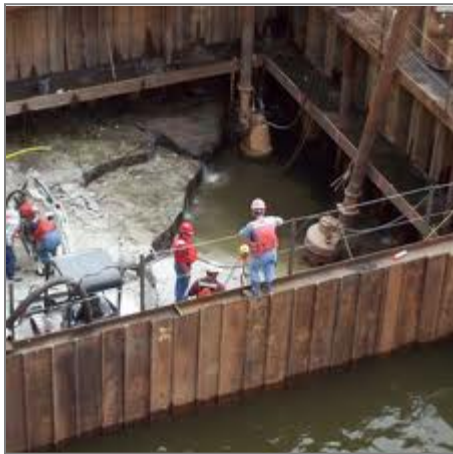


Figure 5-11: Cofferdams surrounding work area

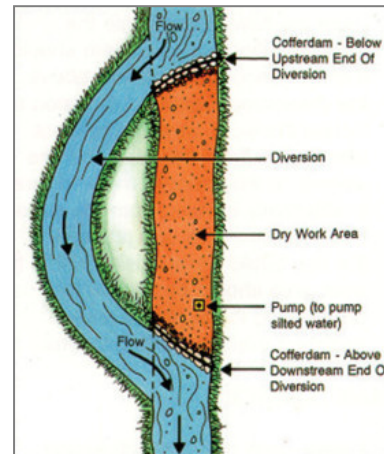


Figure 5-12: Illustration of stream diversion and cofferdams

f)

- g) Floating silt curtains or suitable alternative shall be used to contain and control the dispersion of turbidity and sediment when working in or near a water body;
- h) The curtain shall be located beyond the lateral limits of the construction site; the alignment shall be as close as possible to the activities but not so close as to be disturbed by the construction equipment;
- i) The curtain shall be firmly anchored in place by posts; and
- j) The contractor shall remove built up sediment and debris as required; if the fabric becomes clogged it shall be replaced.
- k) Fish Habitat and Relocation

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- l) A license to conduct fish sampling/collection permits shall be obtained from DFO prior to any sampling, collection or relocation activities;
- m) The waterbody shall be de-watered using a screened pump which shall be deployed on a floating structure near the deepest portion of the pond/river. The pump shall be monitored during all de-watering. The water shall be directed to a vegetated area so that any sediment carried by the pump will be further filtered through vegetation before reaching another water body. The pumped water and the screen shall be monitored for fish during all pumping. Optimally, the pond shall be reduced to a small containment area capable of being electrofished/seined by boat;
- n) If soft sediment moves toward the deeper part of the area during draw-down, this will effectively reduce the size of the area and shall require careful monitoring of water levels so that too much water is not removed hence trapping all fish in a thick layer of sediment;
- o) Electrofishing inside the small containment area left after de-watering shall be conducted by a small boat so as to reduce the amount of sediment disturbance. Other techniques shall be available should electrofishing become inefficient due to increased sediment disturbance (e.g. seining and/or casting net). The boat shall be of a non-conducting material so that the electrofisher will not short out (e.g. zodiac, fibreglass/plastic canoe). A second small boat shall be used to transport any captured fish to shore so that disturbance of bottom sediment is minimized. This boat shall be moved between the shore and collection boat by ropes. This may be modified in the field as necessary;
- p) Water temperature will be another critical factor in successful relocation of all fish, as the reduced pond will warm relatively quickly. Optimally, it would be desirable to begin collection of fish in the early morning hours. Coordination of the draw-down shall be conducted to ensure this can occur. Water temperature shall be monitored continually and any exceedance of the Experimental License requirement shall mean a stop in collection, is required. However, this may be a field-call as pausing once the pond is reduced may cause more harm than completing the relocation. This situation shall be avoided;

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- q) Monitoring shall include recording water temperatures, dissolved oxygen levels, pH, and visual observations of stress and/or overcrowding. If signs of stress and/or overcrowding are observed, additional measures may be required;
- r) Once the pond has been de-watered, the small containment area shall be electrofished, seined, and/or netted to remove any remaining fish;
- s) All fish shall be contained in 20 litre buckets for transport to the release point. Each bucket shall be relocated once five fish are exceeded or thirty minutes have passed so that stress is avoided;
- t) All fish shall be acclimatized prior to release. Each bucket shall be laid into the receiving water so that water temperatures between both are equal (measured using thermometers). Once acclimated, fish shall be released;
- u) An estimate of the length of each fish shall be obtained in order to calculate the total weight of the fish;
- v) Experienced personnel shall be responsible for capture and release of the fish. The person responsible for capture shall be familiar with all equipment and shall be able to adjust the voltage on the electrofisher as water levels and conductivities change. They shall also be able to detect signs of fish stress. The person responsible for fish release shall be experienced in acclimating fish and monitoring their health. They shall also be able to estimate fish species and lengths; and
- w) If dewatering is required as part of the execution of work, a dewatering plan shall be developed as part of the C-SEPP.

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5.20 Work In/Around Marine Environment

Environmental Concern

The principle environmental concerns from marine construction include the release of fines, hazardous liquids, and toxic substances to the water and substrate, and disturbance to fish and fish habitat. Marine construction activities can also disturb nearshore terrestrial habitat and cause seabirds, waterfowl and marine mammals to avoid the area.

Environmental Protection Procedures

- a) Work in and around the marine environment shall require a permit for the Alteration of a Waterbody under the *Newfoundland and Labrador Water Resources Act*, and the *Federal Navigable Waters Protection Act*. In addition a request for project review to DFO may be required for infilling. If a letter of advice is issued from DFO, all conditions shall be followed;
- b) Clean blasted rock shall be used for infilling. Armour stone protection shall be placed progressively to minimize erosion and to prevent the loss of infill material. All blasted material shall be taken from an approved quarry site;
- c) The operation of heavy equipment shall be confined to dry, stable areas or approved barges;
- d) Infilling shall be done in compliance with the *Navigable Waters Protection Act* authorization;
- e) Any timber cribbing used for construction of temporary or permanent structures shall consist of untreated wood (or preservatives safe for the marine environment);
- f) Sedimentation prevention methods as outlined in Section 5.25, Erosion Prevention and Sediment Control shall be used where appropriate to control sedimentation into the marine environment during infilling;
- g) Refer to Section 5.19 for silt control procedures in water works;
- h) All equipment shall have muffled exhausts to minimize noise;

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- i) Fuelling of equipment shall follow the buffers outlined in the Buffer Zone section (Section 5.18);
- j) All vehicles shall be clean and in good repairs. Regular mechanical inspections for leaks on all equipment shall be made and repairs undertaken immediately; and
- k) The Master Spill Response Plan (within the ERP) and appropriate spill kits for equipment shall be available on-site (see Section 5.13).

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5.21 Grubbing and Disposal of Related Debris

Environmental Concerns

The principal concerns associated with grubbing and disposal of related debris are the potential effects of erosion and sedimentation on marine and freshwater ecosystems and water quality.

Environmental Protection Procedures

All grubbing and disposal of related debris near watercourses shall adhere to relevant regulatory requirements, including the permits from DOEC and the formal “Letters of Advice”, “Operational Statements”, and/or Authorizations for Works or Undertakings Affecting Fish Habitat from the Fisheries and Oceans Canada.

Other specific measures to be undertaken to minimize potential effects on aquatic habitat and resources are as follows:

- a) Grubbing of the organic vegetation mat and/or the upper soil horizons shall be minimized. These shall be left in place where possible. Limits of stripping and/or grubbing shall be shown on all drawings issued for construction;
- b) The organic vegetation mat and upper soil horizon material, which has been grubbed, shall be spread in a manner that attempts to cover exposed areas. Any surplus material shall be stored or stockpiled for site rehabilitation and revegetation purposes elsewhere in the Project area. Topsoil and peat shall be stockpiled separately from the overburden and separated by a buffer zone (Section 5.18) from any waterbodies, watercourse or ecologically sensitive areas. The location of the stockpiles shall be shown on drawings issued for construction and accessible for future rehabilitation purposes;
- c) A minimum of 5 metres should separate stockpiles of grubbed material from standing timber;
- d) Grubbed material and/or topsoil shall be stored in low piles to decrease the effect of compaction on structure. Stockpiles of topsoil should be seeded or otherwise protected using erosion control methods as outlined in Section 5.25, Erosion Prevention and Sediment Control to prevent erosion and loss of

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nutrients. This is especially important if stockpiles are to remain in place for periods of a year or more;

- e) Erosion prevention and sediment control measures shall be installed to minimize and control runoff soil erosion and transport of sediment laden water during grubbing and the re-spreading and stockpiling of grubbed materials. Section 5.25, Erosion Prevention and Sediment Control outlines all acceptable prevention and control methods (i.e. use of sediment ponds);
- f) Where grubbed materials are re-spread or stockpiled; as many stumps and roots as possible shall be left in place to maintain soil cohesion, to dissipate the energy of runoff, and promote natural re-vegetation;
- g) The length of time that grubbed areas are left exposed to the natural elements shall be minimized to prevent unnecessary erosion. These areas shall be monitored for erosion and such findings shall be reported to the On-Site Environmental Monitor;
- h) During grubbing, care shall be taken to ensure that grubbed material shall not be pushed into areas that are to be left undisturbed (Figures 5-13 and 5-14 show examples of grubbing activities and a grubbed right-of-way);
- i) Grubbing shall be avoided on steep slopes near watercourses. A buffer zone shall be maintained between grubbed areas and watercourses, waterbodies and ecologically sensitive areas (Section 5.18). Grubbing limits adjacent to watercourses shall be flagged in the field prior to undertaking grubbing/stripping activities;
- j) Grubbing and other debris shall not be permitted to enter any watercourse;
- k) Bog and other wet material that is excavated from the site shall be piled and graded on well drained ground in low piles. The piles shall be seeded or otherwise protected using erosion control methods as outlined in Section 5.25, Erosion Prevention and Sediment Control; and
- l) Where the piles are in the transmission line right-of-way they shall not impede access to the line for future maintenance or access.

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Figure 5-13: Example of grubbing activities



Figure 5-14: Example of grubbed and cleared path

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5.22 Quarrying and Aggregate Removal from Borrow Areas

Environmental Concerns

The principle concerns for quarry development and associated aggregate removal include the potential for impacts on aquatic systems, loss of terrestrial habitat and historic resources, potential quarry development/rehabilitation plans.

Environmental Protection Procedures

The following measures shall be implemented to minimize these effects:

- a) Permits to quarry shall be obtained from the NL Department of Natural Resources before quarries are established. Quarry activity shall be undertaken in compliance with these quarry permits and shall comply with all other relevant regulations;
- b) Quarries shall be located 100m from a water body unless otherwise approved by the Department of Natural Resources. If approved, additional mitigative measures may be required;
- c) The development of quarry sites and rock excavations shall require monitoring to determine the absence or presence of sulphide bearing rock. For environmental protection against Acid Rock Drainage (ARD), the On-Site Environmental Monitor shall visually inspect bedrock before, during, and after excavation work on a periodic basis. . Visible evidence of ARD is typically a yellowish colour of water or sediment called yellow boy or evidence of sulphides in rock. In the event that visible evidence of ARD is noted, the On-Site Environmental Monitor shall be notified immediately. Photographs of yellow boy and sulphides (Figures 5-15 – 5-18) are shown below;

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Figure 5-15: Photograph of Yellow Boy water run-off



Figure 5-16: Photograph of Yellow Boy water run-off



Figure 5-17: Typical sulphides in rock



Figure 5-18: Typical sulphides in rock

- d) Quarry areas shall be developed in a controlled manner so as to minimize potential environmental effects and locations shall consider sensitive wildlife areas. The following protection procedures shall be implemented to minimize disturbance and facilitate rehabilitation:
- e) A buffer zone of undisturbed vegetation shall be maintained between borrow areas/quarries and watercourses, waterbodies and ecologically sensitive areas (see Section 5.18);

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- f) The quarry area, stockpile area and limits of clearing shall be staked and/or flagged to prevent over-extension of the development, (corner posts at least 1 metre high above ground shall be installed to mark the quarry area);
- g) The area to be excavated shall be clear cut of all vegetation prior to grubbing, excavation or removal of any material. Only the area necessary for one year's production shall be cleared;
- h) All stumps, organic matter and topsoil shall be stripped from the area to be excavated and stockpiled at least 5 m from uncleared areas; stockpiles shall be kept at least 10 m from the area of excavation; separate overburden piles shall be developed where this material is present; topsoil and the underlying overburden shall not be mixed (Section 5.21);
- i) Stockpile areas are to be confirmed by the On-Site Environmental Monitor, prior to stripping;
- j) Upon completion of excavation of a quarry, no cliff faces or benches shall be left at a height of greater than 5 m. Available material left over from quarrying and stockpiled overburden shall be used to minimize slopes and face heights and to rehabilitate the area (Section 5.35);
- k) Each quarry shall be evaluated by the On-Site Environmental Monitor on a site-specific basis to determine whether the cliff faces shall be converted to rubble slopes; and
- l) Following sloping, the topsoil and any organic materials shall be re-spread over the disturbed area to promote natural re-vegetation by adjacent seed sources (5.35).
- m) In order to prevent sedimentation of waterbodies, watercourses and ecologically sensitive areas, sediment control measures (basins and traps) shall be established, if required, and cleaned on a regular basis, as required, to ensure that the retention capacity is maintained at all times. Section 5.25, Erosion Prevention and Sediment Control outlines all acceptable sediment control measures;

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- n) The Total Suspended Solid (TSS) content of construction-altered water that is released into a natural waterbody shall not exceed 30 milligrams per litre⁴ and be in compliance with *Environmental Control Water and Sewage Regulations, 2003*;
- o) With respect to maintenance of water quality within receiving waterbodies on and around the site, the *CCME Canadian Water Quality Guidelines for the Protection of Aquatic Life* shall be used;
- p) The pH level of construction-altered water that is released into a natural waterbody shall be between 5.5 and 9 pH units and be in compliance with *Environmental Control Water and Sewage Regulations, 2003*;
- q) Dust from aggregate processing, storage and handling shall be controlled with water as required during times when temperatures are above freezing. A water use license must be obtained from the Water Resources Management Division;
- r) If crushing activities in the quarry require a water source, a license from the DOEC, Water Resources Management Division, shall be obtained prior to any water use; and
- s) Quarry operations shall consider sensitive wildlife periods as outlined in Section 5.1.

⁴ If water is being abstracted from a water course, used, treated and subsequently returned to the same water course, these solids data mean that the effluent should not contain more than 30 milligrams per litre more than was in the water originally abstracted.

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5.23 Trenching

Environmental Concerns

Where linear excavations for the construction of water lines or any other infrastructure is undertaken, potential runoff of sediment-laden water could result in effects on marine or freshwater fish and fish habitat, water quality and historic resources.

Environmental Protection Procedures

The following measures shall be implemented to minimize the potential effects of trenching:

- a) Topsoil and excavated overburden and bedrock shall be stored in separate stockpiles for later use during rehabilitation;
- b) Any unsuitable material shall be disposed of in a disposal area to be confirmed by the On-Site Environmental Monitor;
- c) Dewatering of trenches, as outlined in Section 5.27 shall make use of measures to minimize and control the release of sediment laden water through the use of acceptable sediment control measures as outlined in Section 5.25, Erosion Prevention and Sediment Control; and
- d) Backfilling of linear trenches shall allow for settlement to ensure that the finished grade of the trench is level with the surrounding surface.

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5.24 Excavation, Backfilling and Grading

Excavation, backfilling and grading of common rock and other materials may be required at various locations within the Project site.

Environmental Concerns

The principal environmental concerns associated with excavation, backfilling and grading are potential effects on water quality and fish and fish habitat due to run-off of sediment laden water. Potential disturbance to rare species and habitat and archaeological resources must also be taken into account.

Environmental Protection Procedures

All work shall be conducted in a manner that ensures the minimum amount of disturbance necessary and controls potential sedimentation of watercourses and waterbodies in or adjacent to the work areas as outlined in the following procedures:

- a) Excavation, backfilling and grading shall be done only after grubbing and stripping is completed. Where engineering requirements do not require grubbing and stripping (e.g., within the buffer zone of a stream crossing), filling shall occur without any disturbance of the vegetation mat or the upper soil horizons;
- b) Excavation, backfilling and grading in the vicinity of stream crossings shall be done in a manner that minimizes erosion and sedimentation of watercourses and water bodies; and
- c) A buffer zone of undisturbed vegetation shall be maintained between construction areas and all watercourses, waterbodies and ecologically sensitive areas (Section 5.18).

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5.25 Erosion Prevention and Sediment Control

Environmental Concerns

The potential for erosion and resulting effects to water quality and fish and fish habitat is a key environmental concern associated with construction activities. Figures 5-19 and 5-20 show sediment run-off situations that can be avoided by following the environmental protective measures herein.



Figure 5-19. Sediment plume in water



Figure 5-20. Sedimentation on land

Environmental Protection Procedures

Erosion prevention and sedimentation control shall be a main objective in all work areas where soil may be transported by water, wind, or ice. An Erosion and Sedimentation Control Plan shall be prepared and submitted by the Contractor as part of the C-SEPP, prior to the start of site activities.

Storm water discharge into any water body showing on 1:50,000 mapping shall require a DOEC permit under the Water Resources Act.

5.25.1 Site-Specific Erosion and Sedimentation Control Plan

The following outlines the requirements of the Erosion and Sedimentation Control Plan:

- a) A brief description of the proposed land disturbing activities, existing site conditions and adjacent areas;

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- b) A description of the critical areas on the site (i.e. areas that have a potential for serious erosion problems);
- c) Construction schedule that includes the date stripping and grading will begin and the expected date of stabilization;
- d) A brief description of the measures that shall be used to minimize erosion and control sedimentation on the site including types, options, when they shall be installed and where they shall be located;
- e) An inspection and maintenance program including frequency of inspection and repair, clean out and disposal of trapped sediment, duration and final rehabilitation when site work is complete;
- f) Shut down plans where construction plans are delayed for an extended period of time;
- g) An emergency response plan that identified available short term resources in terms of personnel, equipment and erosion and sedimentation control measures and reporting steps;
- h) Name of person preparing plan and professional stamp/designation;
- i) Site plan including the following features:
- j) Existing and final site contours at an interval and scale sufficient to identify runoff patterns before and after disturbance;
- k) Existing vegetation and buffers;
- l) Limits of clearing and grading;
- m) Critical areas; and
- n) Location and type of erosion and sedimentation control measures with dimensions.
- o) Detailed drawings of all erosion and sedimentation control structures and measures showing dimensions, material and other important details;
- p) The following calculations:

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- q) Design calculations for erosion and sedimentation control measures (culverts, channels, sediment traps, etc.) such as particle size, flow rates and peak discharge;
- r) Calculations to demonstrate the design of sediment removal efficiency; and
- s) Any other calculations, as required.
- t) Contingency measures shall be implemented to deal with storm events and high run-off in order to minimize adverse environmental effects from these events. Erosion prevention and sediment containment measures and required equipment shall be available to address contingency/emergency situations.

5.25.2 Erosion Prevention

The primary way to control erosion is to prevent activities that can contribute to it. However, specific erosion control measures may be required to be designed for the site to minimize the effects of construction activities on the environment. Options for erosion prevention are discussed in the following sections.

5.25.2.1 Discussion of Erosion Control Options

Slope Treatments

Several slope treatments can be used to reduce erosion. Slope treatments are used prior to seeding for vegetation growth. Roughening a slope with horizontal depressions helps control erosion by creating safe seeding sites therefore increasing vegetation, reducing runoff velocity, and increasing infiltration. The depressions also trap sediment on the face of the slope. The amount of roughening required depends on the steepness of the slope and the type of soil. Stable, sloping rocky faces may not require roughening or stabilization, while erodible slopes require special surface roughening. Roughening methods include stair-step grading, grooving, and tracking. All three methods are shown in Figures 5-21 to 5-23.

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Figure 5-21: Photograph of grooving slope treatment method

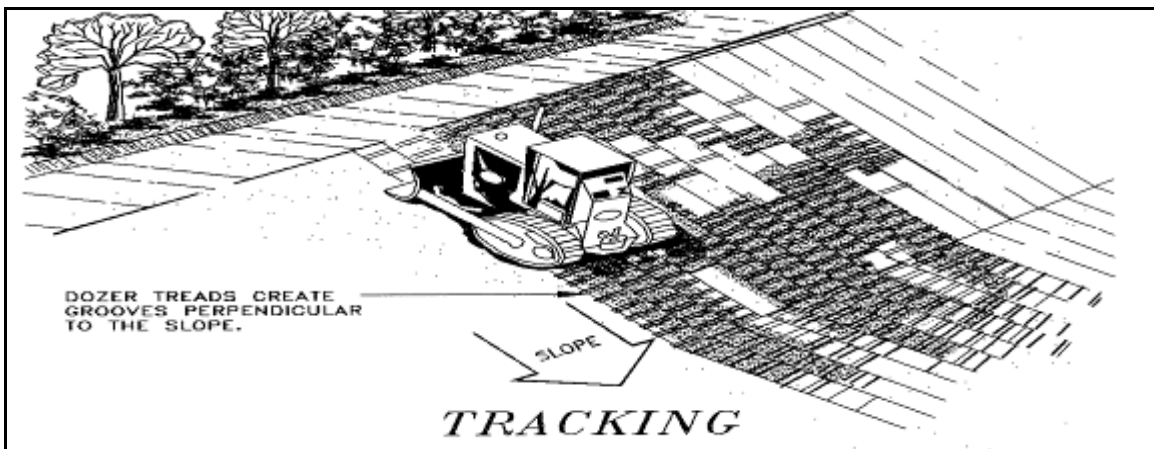


Figure 5-22: Illustration of tracking slope treatment method

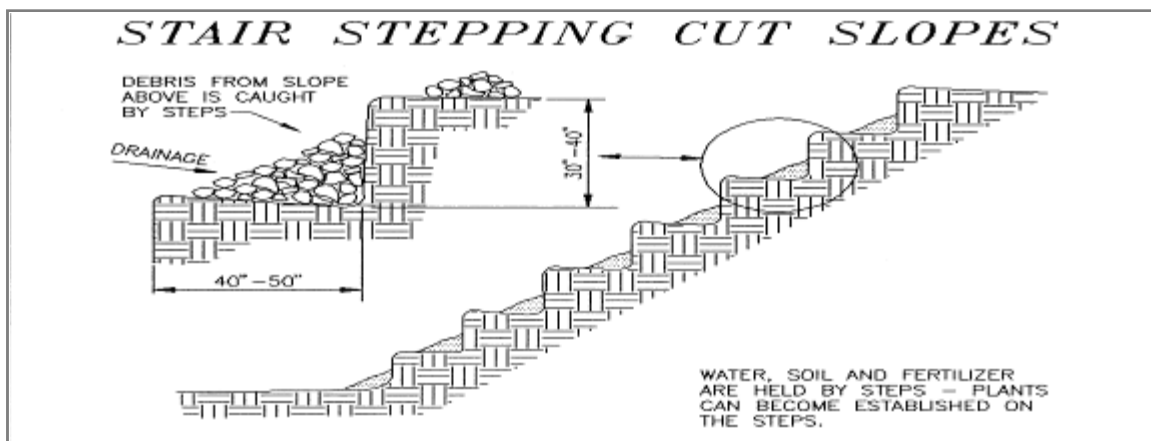


Figure 5-23: Illustration of stair stepping slope treatment method

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Erosion Control Nets/Mats/Blankets/Fibrous Rolls

Erosion control blankets are temporary protective barriers laid on top of bare soil vulnerable to erosion, commonly made of mulch, wood fibre, straw or synthetics. They are typically used on short steep slopes where there is a high erosion potential and slow vegetation establishment. Rolled Erosion Control Products (RECPs) are manufactured mulch blankets (see Figure 5-24) that protect soil from erosion and Turf Reinforcement Mats (TRMs) are used to help establish vegetation in channels.



Figure 5-24: Photograph of Erosion Control Blanket used on a slope

Erosion control nets are typically synthetic textiles or nets that degrade over time. The nets are woven to permit plants to take root through the holes in them. They also act as a medium to retain water for longer period of time. Different grade of nets are used based on the topography of the ground. The more closely knit nets can be used to curtail erosion in high slope areas, while the more loosely knit nets can be used in flatter terrain. Installation of erosion control mats and blankets shall take into consideration the criteria listed in Section 5.25.2.2.

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Fibre rolls serve as barriers between up gradient construction and downgradient water bodies. Fibre rolls are installed on slopes in line with one another with one at the base of the slope. The space between each row of fibre roll is dependent on the steepness of the slope. The steeper the slope, the more rows of evenly spaced horizontal rows of rolls is needed. Fibre rolls are fastened to the ground with wooden stakes. Figures 5-25 and 5-26 show some of the methods of erosion control.



Figure 5-25: Photograph of Fibre Rolls used to stabilize



Figure 5-26: Photograph shows erosion control blanket on slope and erosion control mat in channel

Rip Rap

Rip rap can be used as an erosion-resistant ground cover and when installed properly will reduce the velocity of runoff and increase infiltration. Rip rap typically works well on river banks and/or bottoms, roadside ditches and tops of slopes. A non-woven geo-textile liner should be used at the top of the channel to prevent migration of fines. Rip rap placement shall follow criteria listed in Section 5.25.2.2 and applicable construction specifications and drawings. Figure 5-27 shows properly placed rip rap while Figure 5-28 shows poorly placed rip rap with geotextile exposed.

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Figure 5-27: Photograph of Rip Rap placed along a slope



Figure 5-28: Photograph of failed Rip Rap Protection

Check Dams and Dikes

Check dams and dikes are temporary barriers that are typically constructed of rocks, gravel bags, sandbags or fibre rolls that are installed across a constructed swale or drainage ditch to reduce the velocity of water. They are placed in areas where runoff erosion has occurred or where runoff needs to be diverted or channelled. They are not designed to stop the water, but to slow it down. Check dam and dyke installation shall follow the criteria listed in Section 5.25.2.2 and applicable construction specifications and drawings.

Check dams shall be maintained and inspected periodically as well as unscheduled inspections prior to, and after, a significant rainfall event, anticipated heavy precipitation or runoff event (e.g. snow melt). Removal of sediment from check dams shall be conducted as required, in order that the check dam continues to perform its function of reducing the amount of sediment present in the run-off. Photographs of rock constructed check dams are shown below in Figures 5-29 and 5-30.

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Figure 5-29: Photograph of Rock Constructed Check Dam



Figure 5-30: Photograph of a Rock Constructed Dike

Energy Dissipaters

Energy dissipaters (or outlet protection devices) are devices that are installed on the downstream end of a culvert or outlet and are used to reduce the velocity of the water flow. Energy dissipaters are typically made of rocks (rip rap apron); however they can be man-made devices such as concrete blocks or metal prongs. Energy dissipaters required for fish bearing waters shall be of natural means (not man-made). Energy dissipaters require engineering design to accommodate the velocity and volume of flow and shall follow the criteria listed in Section 5.25.2.2 and applicable construction specifications and drawings. Figure 5-31 shows properly constructed or placed energy dissipaters while Figure 5-32 shows improperly placed rocks as energy dissipaters.

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Figure 5-31: Correct Construction of Rock Energy Dissipaters



Figure 5-32: Incorrect Construction of Rock Energy Dissipaters

5.25.2.2 Design Criteria and Installation Procedures for Erosion Control Measures

Design criteria and installation procedures for applicable options discussed above are listed below. Reference shall be made to these criteria if either of these options is deemed suitable for site-specific conditions.

Straw Mats

- Straw mats shall be applied at a rate of 3000 to 8000 lb/acre;
- Soil shall be visible through the straw mat (not too heavily applied);
- Straw shall be applied by blower or by hand; and
- Straw shall be anchored to prevent it from blowing away.

Wood Fibre Mulch

- Preferable on steep cut slopes of 2H:1V or steeper; and
- Wood fibre mulch shall be applied at a rate of at least 1000 lb/acre (increasing the rate of application will increase effectiveness).

Rolled Erosion Control Products (RECPs)

- May be used for gradients of 2.5H:1V or steeper;
- Shall be installed on unfrozen ground;

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- c) Slopes shall be top soiled and seeded prior to placing RECP;
- d) Blankets shall be in full contact with the soil by properly grading soil, removing rocks or deleterious materials, prior to placing blanket;
- e) In channels, blankets shall extend above the anticipated flow height, with a minimum 0.5 m of free board;
- f) For turf reinforcement mat (TRM), blanket shall be placed immediately after top soiling;
- g) Blanket shall be anchored by using wire staples, metal geotextile stake pins, or triangular wooden stakes; and
- h) Blankets shall be placed longitudinal to direction of flow, with fabric not stretched but maintaining contact with underlying soil.

Rolled Erosion Control Products (RECPs) on Slopes

General Installation Methods for RECPs on slopes are listed below however all installation shall be designed on a site-specific basis and products shall be installed according to manufacturers procedures.

- a) Prepare surface and place topsoil and seed (surface should be smooth and free of rocks, debris, or other deleterious materials);
- b) Blanket shall be anchored at top of slope in a minimum 0.15 m by 0.15 m trench for the entire width of the blanket;
- c) The blanket shall be rolled out downslope;
- d) Where the blanket roll is not long enough to cover the entire length of the slope, a minimum 0.15 m by 0.15 m check slot shall be excavated at the location of the lap, and the downslope segment of blanket anchored in the check slot, similar to the method used for the top of the slope, or (2) when blankets, must be spliced down the slope, place blanket end over end (shingle style) with approximately 0.10 m overlap. Staple through overlapped area at 0.3 m intervals;
- e) The upslope portion of blanket shall overlap the downslope portion of blanket, shingle style, at least 0.15 m with staple anchors placed a maximum 0.3 m apart;

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- f) Adjacent rolls of blanket shall overlap a minimum 0.1 m;
- g) Anchors shall be placed along central portion of blanket spaced at 4/m² minimum (0.5 m spacing) for slopes steeper than 2H:1V and 1/m² (1 m spacing) for slopes flatter than 2H:1V; and
- h) Anchors along splices between adjacent rolls shall be placed 0.9 m apart.

Rolled Erosion Control Products (RECPs) in Channels

General Installation Methods for RECPs in channels are listed below however all installation shall be designed on a site-specific basis and products shall be installed according to manufacturers procedures.

- a) Prepare surface and place topsoil and seed (surface should be smooth and free of large rocks, debris, or other deleterious materials);
- b) Excavate a minimum 0.15 m deep and 0.15 m wide trench at the upstream end of channel and place end of RECP into trench;
- c) Use a double row of staggered anchors approximately 0.1 m apart (i.e. 0.2 m linear spacing) to secure RECP to soil in base of trench;
- d) Backfill and compact soil over RECP in trench;
- e) Roll centre RECP in direction of water flow on base of channel;
- f) Place RECP end over end (shingle style) with a minimum 0.15 m overlap downgrade;
- g) Use a double row of staggered anchors approximately 0.1 m apart to secure RECP to soil;
- h) Full length edge of RECP at top of sideslopes shall be anchored in a minimum 0.15 m deep and 0.15 m wide trench;
- i) Use a double row of staggered staple anchors a maximum of 0.1 m apart (i.e. 0.2 m linear spacing) to secure RECP to soil in base of trench;
- j) Backfill and compact soil over RECP in trench;

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- k) Overlap RECP on side slopes (shingle style down channel) a minimum of 0.1 m over the centre RECP and secure RECP to soil with anchors spaced a maximum of 0.2 m apart;
- l) In high flow channels, a check slot across the width of the channel is recommended at a maximum spacing of 10 m to anchor the ends of the RECP to the underlying soil;
- m) Use a double row of staggered staple anchors a maximum of 0.1 m apart (0.2 m linear spacing) to secure RECP to soil in base of check slot; and
- n) Backfill and compact soil over RECP in check slot.

Rip Rap

The following criteria shall be considered when installing rip rap:

- a) Used for grades 5-15%;
- b) It shall be constructed of durable, large, loose stone;
- c) A non-woven geo-textile liner shall be used at the top of the channel to prevent migration of fines;
- d) Side slopes of rip rap must be a slope of IV:3H or less;
- e) Rip rap shall be of angular stone; and
- f) Rip rap depth shall be at least 300mm and 1.5x the maximum stone diameter.

Check Dams and Dikes

The following criteria are to be considered when installing a check dam:

- a) Check dams shall not be used in live streams or in channels with extended base flows, as this may have a detrimental effect on fish or fish habitats;
- b) The check dam sediment trap shall consist of rock fill with filter fabric on the upstream face held in place with small shot rock;
- c) Accumulated sediment shall be cleaned out of the filter fabric at regular intervals as required and the material shall be disposed of so that it cannot subsequently run into any waterbodies containing fish;

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- d) Any damaged section(s) of filter fabric as well as any undercut or end flow areas where water flows freely around the filter fabrics shall be repaired or replaced;
- e) Drainage area shall be less than 4 ha;
- f) The filter fabric shall be of a weight of at least 200g/m²;
- g) The rock fill shall be clean rock, with rock fragments sized between 100 and 150mm;
- h) The small shot rock shall be clean rock, with fragments no larger than 120mm;
- i) When used in series, the top of the downstream check dam shall be level with the bottom of the next dam upstream; and
- j) The check dam shall extend beyond the top of the ditch banks and the centerline elevation shall be low enough that flow does not go around the structure; and
- k) Check dams shall be maintained and inspected periodically as well as unscheduled inspections prior to, and after, a significant rainfall event, anticipated heavy precipitation or runoff event (e.g. snow melt). The following maintenance shall be completed, as required:
 - remove any accumulations of sediment; and
 - add or remove rock as necessary to maintain design height, cross-section and flow through characteristics.

Energy Dissipaters

The following criteria are to be considered when installing energy dissipaters:

- a) Energy dissipaters are preferably constructed on level grade for a distance which is related to the outlet flow rate and the tail water level;
- b) The sill or transition to the natural channel shall be level with and at the same slope as the receiving channel;
- c) Energy dissipaters are applicable for small and medium size culverts of any cross section where the depth of flow at the outlet is less than the culvert height;
- d) For rip rap aprons, the apron width at the pipe end shall be 3x the pipe diameter;

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- e) Energy dissipaters shall drain by gravity when not in operation; and
- f) Energy dissipaters shall be self cleaning and require minimum maintenance.

5.25.3 Sedimentation Prevention

5.25.3.1 Silt Fences/Sediment Barriers

Sediment barriers are temporary sediment control devices that are used to protect water quality of down gradient rivers, streams and other water bodies from sediment in water runoff. The most common barriers are silt fences; however other options include straw or hay bales or a berm of erosion control mix. Silt fences are typically used in combination with other site water control measures including sediment traps and basins. Engineering requirements may vary depending on the locations of the silt fence and shall take such factors into consideration as drainage/surface area of exposed soils and time of year the silt fence is employed.

Silt fences typically consist of a piece of synthetic filter fabric stretched between a series of wooden stakes. The stakes are installed on the downhill side of the fence, and the bottom edge of the fabric is trenched into the soil and backfilled on the uphill side. The storm water passes through the fence and sediment is deposited on the uphill side of the fence.

Silt fences are suitable for sheet runoff from exposed areas of soil with grades less than 5% as a result of construction activities. The following criteria shall be taken into consideration when installing silt fences:

- a) The silt fence shall consist of a filter fabric fence held in place by posts;
- b) The woven filter fabric shall be of a weight of at least 200 g/m²;
- c) No single run of silt fence shall exceed 100 m in length;
- d) The drainage area behind the silt fence shall not exceed 0.1 ha per 30 meters of fence;
- e) Silt fences shall not be installed on a slope, and be located no nearer than 1 m from the toe of slope;
- f) Silt fences shall not be used when the overland flow exceeds 0.03 m³/sec;
- g) The fabric shall be at least 900mm wide/high;

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- h) The fence posts shall be of sufficient length to support the fabric, be sturdy and be of dimensions of at least 50mm square;
- i) The staples shall be sufficiently sturdy to support the fabric for the required life of the fence;
- j) The posts shall be secured at 3m intervals on the immediate down slope side of the trench;
- k) The filter fabric shall be taken from a continuous roll, and cut to the required length. The maximum length of the filter fabric shall be stapled to the upstream side of the stakes, with 200mm of fabric extending into the trench and spread over the trench bottom;
- l) When installing a silt fence in frozen earth or rock, metals posts shall be used and wire ties shall be used to attach the filter fabric (Figure 5-36);
- m) When a fence is installed in frozen earth it shall be checked and potentially replaced during spring melt as the posts may have shifted with the melting earth; and
- n) Silt fences shall be removed when the site has been stabilized, or re-vegetated.

Silt fences shall be inspected and maintained on a regular basis as well as before any anticipated heavy precipitation or runoff event (e.g. snow melt). Accumulation of sediment shall be periodically removed and disposed of in an area where it shall not re-enter any waterbody.

Also, repairs and replacement of damaged silt fences shall be addressed immediately. Figures 5-33 to 5-35 show proper construction of silt fences and Figures 5-36 and 5-37 show poorly constructed silt fences that have failed and allowed silt or silty water to pass through.

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Figure 5-33: A well constructed silt fence

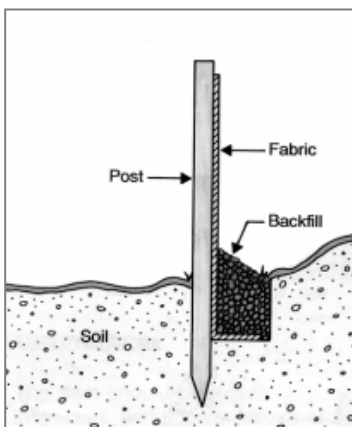


Figure 5-34: Properly constructed silt fence

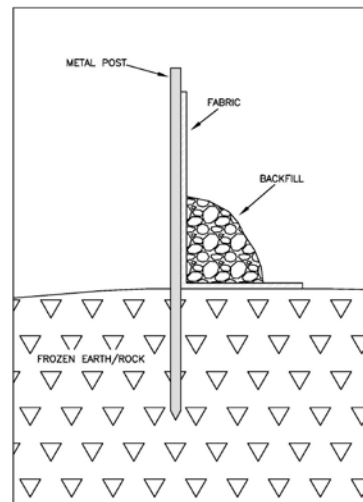


Figure 5-35: Properly Constructed Silt Fence for Frozen Earth or Rock

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Figure 5-36: Examples of poorly installed silt fences



Figure 5-37: Examples of poorly installed silt fences

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5.26 Site Water Management

Environmental Concerns

For a large-scale, earth-moving construction projects such as the Lower Churchill Project, a major consideration in the protection of water quality and aquatic resources is the management of site water run-off and associated suspended solids. The protection of water quality and aquatic resources shall focus on prevention, containment and treatment of water and wastewater associated with the site. Site water management can be divided into three main categories: Surface Water Interception, Containment and Treatment.

Environmental Protection Procedures

The main focus of measures to protect water quality and aquatic resources is prevention. Preventative measures shall include measures to reduce the volume of water entering the work sites (thereby reducing the volume of water that requires subsequent containment and treatment). Site water management systems shall be installed as per technical specifications and/or the C-SEPPs. See references such as DFO's Fact Sheets on Ditching, Filter Fabric, Rock Check Dams and Temporary Settling Basins for more information related to erosion prevention and sedimentation control.

Storm water discharge into any water body showing on 1:50,000 mapping shall require a DOEC permit under the *Section 48 of the Water Resources Act*. Effluent monitoring locations, frequency, sampling and reporting shall comply with the conditions of the permit.

5.26.1 Description of Site Water Management Methods

Surface Water Interception

Reducing the amount of water entering the work sites through surface water runoff, infiltration through the cofferdams and groundwater seepage may be required. At the main work sites ditches shall be incorporated into the site layout to intercept surface water and divert it around the work areas. Infiltration through the cofferdams and groundwater seepage shall be reduced by the installation of a properly designed sump and pump well systems that shall draw down the water table.

Containment

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Once in the work areas, water shall be contained until the water can be treated and released. A system of ditches and drains, incorporated with sump and pump systems, may be required to handle water that enters all excavations. Where required, ditches, drains and sumps shall be located along the lower boundaries of the construction sites to intercept and contain silty or sediment laden water. Measures to contain water from excavations and other construction works shall include but not be limited to:

- o) The containment of water from concrete production and placement, including the cutting of concrete, washing of forms or water otherwise contaminated by concrete components or admixtures;
- p) The containment of wash water from the cleaning of mixers and mixer trucks;
- q) The control of sediment and run-off from aggregate washing areas. This may include, but shall not be limited to, use of a closed system washing operation or a multiple tiered settling basin system; and
- r) Testing and treatment for elevated levels of TSS or other contaminants related to blasting (such as Ammonium Nitrate and fuel oil).

Treatment (Sediment Ponds/Traps)

Once contained, water shall undergo testing and if necessary treatment prior to release. The goal of site water management is to release water within regulatory limits for all parameters. Water shall be tested for oil and grease, TSS, ammonium nitrates and/or any other parameters outlined by the monitoring plan in the C-SEPP based on usage of equipment and site chemicals as required to meet the *Environmental Control Water and Sewage Regulations, 2003*.

For open excavations, a system of properly designed and constructed settling basins is the preferred method of sediment removal. A sediment basin (also called a sediment pond – See Figure 5-38) is a temporary pond built on a construction site to capture eroded or disturbed soil that is transported due to water run-off. The sediment basin protects the water quality of down gradient water bodies. The sediment suspended in the water settles in the pond before the runoff is discharged. Sediment basins are typically used on larger construction sites (>5 acres). Use of sediment basins is usually in conjunction with other sediment and erosion controls. Reference the DFO Fact Sheet for Temporary Settling (Detention) Basins for more information.

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Figure 5-38: Sediment Basin

A sediment trap is similar to a sediment basin and is basically an embankment built along a waterway or low-lying area on the site. Sediment traps should be installed prior to construction and earth moving activities and are commonly used on smaller construction sites, where a sediment basin is not practical. Use of sediment traps is usually in conjunction with other sediment and erosion controls. The size of sediment traps and basins shall depend on the size of the site, location and rainfall runoff for the area. See Figure 5-39 for a photograph of a sediment trap.

Both sediment ponds and sediment traps require periodic inspection and maintenance. Inspections shall occur following each significant rainfall to ensure proper drainage and to determine if structure repairs are required. Maintenance shall include removal and disposal of accumulated sediment from the settling basins in order to maintain their operating capacity. Sediment shall be disposed of in area that would preclude the sediment from entering waterbodies downstream.



Figure 5-39: Sediment Trap

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Water leaving sediment traps and basins shall be tested for applicable parameters (Schedule A of the *Environmental Control Water and Sewage Regulations, 2003* under the *Water Resources Act*). Following testing, the addition of chemicals or the use of mechanical processes may be required to treat the water in conjunction with settling and filtration.

Contaminated or silted water pumped from excavations or work areas, or any runoff or effluent directed out of the Project site shall have sediment removed by applicable sediment control measures as outlined in Section 5.25, before discharging to a watercourse, waterbody or other ecological sensitive area. In addition, any effluent shall be tested for TSS and hydrocarbons (if there are any indications of hydrocarbon contamination, such as a sheen or odour) before being discharged to any watercourse, waterbody or other ecological sensitive area. Effluent discharge shall comply with the provincial *Environmental Control Water and Sewage Regulations, 2003* under the provincial *Water Resources Act*.

With respect to maintenance of water quality within receiving waterbodies on and around the site, the *CCME Canadian Water Quality Guidelines for the Protection of Aquatic Life* shall be used.

5.26.2 Design Criteria and Construction Considerations

The design of the structures shall consider the following:

- a) The loading of suspended solids in the water;
- b) Particle size and gradation;
- c) The volume of water to be treated;
- d) The rate of inflow;
- e) Rate of outflow; and
- f) The contributing surface area.

Specific design criteria is provided below:

- a) Design storm shall be the precipitation of the 24 hour rainfall intensity from a 1:20 year storm;
- b) Drainage area for each sediment retention structure shall not exceed 2 ha;

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- c) Ponds shall be located in low lying areas where they will not contribute to high groundwater conditions and where the system can return the water to a body of water or recharge the water table;
- d) Pond designs shall include an overflow discharge in case of flooding. The overflow section shall have a minimum width of 1.5 m for every 250 m² of pond area;
- e) Provide 1 to 2 % elevation drop between inlet and outlet grades; and
- f) Maintain a minimum pond depth of 1 m. A minimum length to bottom width ratio of 4:1. The size shall be determined to ensure discharge water meets the *Environmental Control Water and Sewage Regulations, 2003*.

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5.27 Dewatering Work Areas

Environmental Concerns

The major concerns associated with dewatering are sedimentation, direct fish mortality, and/or habitat destruction for freshwater and marine fish species.

Environmental Protection Procedures

- a) Filtration or other suitable measures, such as settling ponds, silt fences and dikes, shall be implemented for sediment removal and turbidity reduction in water pumped from work areas before discharging;
- b) Where possible, clean water meeting the *Environmental Control Water and Sewage Regulations, 2003* shall be discharged to vegetated areas to further reduce any potential effects on watercourses. Additionally, mechanisms to prevent scouring and erosion of the discharge location shall be installed as outlined in Section 5.25;
- c) The size of sedimentation ponds shall be designed to accommodate the anticipated volume of collected water and meet discharge criteria for water quality as outlined in Section 5.26;
- d) Discharged water shall be encouraged to follow natural surface drainage patterns;
- e) Harmful alteration, disruption and destruction of fish habitat shall not be permitted unless a formal HADD Authorization has been obtained from DFO; and
- f) See Fish Habitat and Relocation in Section 5.19 Alterations to a Body of Water/Instream Works.

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5.28 Blasting and Waste Rock Disposal

Environmental Concerns

The general environmental concerns associated with on-land blasting include:

- a) Destruction of vegetation outside excavation limits;
- b) Noise disturbances to wildlife;
- c) Disturbance of archaeological resources;
- d) Release of chemicals (i.e. ammonia) to the environment (explosive mixtures and products); and
- e) Dust generation.

Blasting in or near water bodies can affect organisms with swim bladders (fish) but may also affect a variety of aquatic animals including shellfish, marine mammals, otters, seabirds and waterfowl. The introduction of sediment into the water column is also a concern for marine/freshwater water quality and related effects on aquatic life.

Environmental Protection Procedures

The handling, transportation, storage and use of explosives and all other hazardous materials shall be conducted in compliance with all applicable laws, regulations, orders of the DOEC and the Service NL, the *Explosives Act*, and the *Transportation of Dangerous Goods Act*. The following measures shall be implemented to minimize the effect of the use of explosives and blasting:

- a) Explosives shall be used in a manner that shall minimize damage or defacement of landscape features, trees, ecologically sensitive areas such as wetlands, and other surrounding objects by controlling through standard best practice (including precisely calculated explosive loads and adequate stemming), the scatter of blasted material beyond the limits of activity. Outside of cleared areas, inadvertently damaged trees shall be cut, removed, and salvaged if merchantable (Section 5.8). Fly rock that inadvertently enters a waterbody watercourse or any ecologically sensitive area, and that can be recovered without further damage to the environment shall be removed. Instances where

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larger fly rock (boulders) enters these areas or deep waterbodies, recovery of this shall be discussed with the On-Site Environmental monitor;

- b) Blasting patterns and procedures shall be used which minimize shock or instantaneous peak noise levels;
- c) Time delay blasting cycles or blasting mats shall be used, if necessary, to control the scatter of blasted material;
- d) Blasting shall not occur in the vicinity of fuel storage facilities;
- e) All blasters shall have a Blasters' Safety Certificate from the NL Department of Labour. This certificate and a Temporary Magazine License shall be obtained prior to drilling and blasting;
- f) Use of explosives shall be restricted to authorized personnel who have been trained in their use;
- g) There shall be separate magazines on site for explosives and for dynamite blasting caps. All temporary magazines for explosive storage shall have appropriate approvals;
- h) The immediate area of the blast site shall be surveyed within one hour prior to a blast and operations shall be curtailed if wildlife (e.g. black bears, water fowl, raptors, etc.) is observed within 500 m. Environmental personnel and On-Site Environmental Monitors shall conduct pre-blast monitoring to see and identify species of concern. Additionally, any individual animal sightings by other personnel shall be reported to the On-Site Environmental Monitor. Blasting may be delayed in such circumstances until wildlife have been allowed to leave the area of their own accord;
- i) All blasting associated debris, such as explosive boxes and used blasting wire, must be collected for proper disposal as soon as possible following blasting activity;
- j) If blasting is necessary within the vicinity of an archaeological site, precautions shall be taken to ensure that blasted material and shock waves do not disturb any part of the site. If necessary, protective covering shall be applied to the site

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under the supervision of an approved archaeologist. Blasting shall not be undertaken in these areas without first notifying the On-Site Environmental Monitor;

- k) Waste rock that is suitable for usage at the site shall be set aside for subsequent use. Waste rock not suitable for site use shall be deposited in the designated stockpile area;
- l) Previous testing on selected samples of bedrock has shown the samples to be Non-Potentially Acid Generating (NPAG). As a precautionary measure the On-Site Environmental Monitor shall inspect all areas of blasted rock and rock stockpiles to ensure no evidence of PAG material exists; and
- m) If possible, blasting shall be done outside of sensitive time periods for important wildlife areas (See Table 5-1).

Blasting in Close Proximity to or In a Body of Water

Seismic geophysical methods may require in-water blasting. This may include the use of small sources of energy (explosives, air gun, weight drop, etc.) in the water column.

The following measures shall be implemented to minimize the effect of the use of explosives and blasting in or near water:

- a) When blasting operations are within 200m of a waterbody occupied by fish, the operations shall be carried out in accordance with DFO guidelines;
- b) Downstream areas shall be monitored after each blast for evidence of fish kills and if any are evident, blasting operations shall cease and the incident shall be reported to the On-Site Environmental Monitor;
- c) Three hours prior to any blasting activities near water bodies, a visual reconnaissance of the area shall be undertaken to establish the presence of water fowl or aquatic mammals;
- d) If blasting is necessary within 15 m of a waterbody, it shall be undertaken in compliance with the required Water Resources permits from the DOEC, and DFO Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters, 1998.

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A copy of this reference shall be kept at the Project site and made available to all contractors;

- e) Underwater blasting activities shall require review and authorization from DFO, the On-Site Environmental Monitor shall confirm that the DFO Area Habitat Biologist has been notified 24 hours before the start of blasting operations;
- f) Drilling and blasting activities shall be undertaken in a manner that ensures the magnitude of explosions is limited to that which is absolutely necessary. A blasting plan shall be reviewed with the On-Site Environmental Monitor in advance of work in close proximity to water bodies;
- g) For multiple charges, time delay detonators shall be used to reduce the overall detonation to a series of single explosions separated by minimum delay;
- h) Large charges shall be subdivided into a series of smaller charges with minimum delay detonation;
- i) The on land set-back distance from the blast site to the waterbody or the set-back distance around the blast site in the waterbody shall be based on the maximum weight of charge to be detonated at one instant in time, the substrate, and the type of fish or fish habitat in the area of the blast. These set-back distances are outlined in the Guidelines for Use of Explosives In or Near Canadian Fisheries Waters, 1998 and the DFO Fact Sheet for Blasting – Fish and Fish Habitat Protection; and
- j) Blast holes shall be stemmed with sand or gravel to grade or to streambed/water interface to confine the blast.

Waste Rock Disposal

For environmental protection against ARD and other leaching of heavy metals the On-Site Environmental Monitor shall visually inspect rock before, during, and after blasting work and on a periodic basis. Visible evidence of ARD is typically a yellowish color of water or sediment called yellow boy or evidence of sulphides in rock. In the event that visible evidence of ARD is noted, the On-Site Environmental Monitor shall be notified immediately. Photographs of yellow boy and sulphides are shown in Section 5.22 in Figures 5-16 to 5-19).

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Stockpiling shall be completed in a manner that will reduce the potential for acid rock drainage and metal leaching. All stockpiles shall be placed in an area where drainage can be collected, tested and treated, if required. Consideration shall be given to installing a settling pond for runoff to deal with suspended solids. Stockpile areas and limits of clearing shall be staked and/or flagged to prevent overextension of the development, thereby minimizing the extent of the operation.

Treatment shall be site-specific based on analytical results, however typical treatment shall include settling ponds, the addition of chemicals or the use of mechanical processes to aid in settling or filtration. Treatment options shall be confirmed by the On-Site Environmental Monitor and approved by DOEC.

The release of water from blasting activities and waste rock drainage shall meet Schedule A of the *Environmental Control Water and Sewage Regulations, 2003* before it shall be permitted to be discharged directly or indirectly into a storm sewer, body of water or onto the ground.

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5.29 Concrete Production

Environmental Concerns

The major concern relating to concrete production is the effects of effluent released to the environment. Liquid wastes may contain hazardous materials such as cement, concrete additives, and form oil.

Cement is very alkaline and washwater from spoiled concrete or from the cleaning of the batch plant mixers and mixer trucks, conveyors and pipe delivery systems can have pH levels outside the acceptable range. Similarly, spoiled concrete or washwater would contain concrete additives and agents, some of which are toxic to aquatic species. Aggregates, particularly the finer sand fractions may be washed from spoiled concrete or discharged in washwater. Uncontrolled release of such washwater, chemicals and sediments could adversely affect aquatic life and aquatic habitat.

Environmental Protection Procedures

- a) Approval from DOEC shall be obtained to establish the required concrete batch plants at each site. Plant operations shall comply with the conditions outlined in the approvals and requirements under air pollution control regulations;
- b) Prior to the release of effluent to the environment it shall be tested for appropriate parameters (as outlined in Schedule A of the *Environmental Control Water and Sewage Regulations, 2003*) to ensure effluent quality standards are met. The specific criteria for concrete production are a pH level between 5.5 and 9 and TSS less than 30 mg/L. Release shall be in accordance with runoff control procedures;
- c) With respect to maintenance of water quality in receiving waterbodies on and around the site the *CCME Canadian Water Quality Guidelines for the Protection of Aquatic Life* shall be used;
- d) If water to be released does not meet discharge criteria, it shall be further treated until these discharge criteria have been met;
- e) Treatment shall be site-specific as it depends on analytical results, however typical treatment may include the addition of chemicals or the use of mechanical

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processes to aid in filtration or settling. Treatment options shall be confirmed by the On-Site Environmental Monitor and approved by DOEC;

- f) The Environmental Code of Practice for Concrete Batch Plant and Rock Washing Operations, 1992 shall be adhered to during concrete production activities;
- g) When concrete is to be placed within 15m of a waterbody, provisions of all required permits shall be followed. Under no circumstances shall fresh concrete come into contact with a waterbody, before the concrete has cured;
- h) Washwater from the cleaning of mixers, mixer trucks and concrete delivery systems shall be handled using the procedures outlined in Section 3.0 of the *Environmental Code of Practice for Concrete Batch Plant and Rock Washing Operations*. The following outlines important steps to take; however the code of practice shall be reviewed thoroughly:
 - i) All rinsing activities shall be carried out at the site of the concrete batch plant, except rinsing of the chute;
 - j) The rinsing of the chute may be carried out at the delivery site but care and caution shall be taken before any concrete is rinsed from a chute at the delivery site. It is permissible to rinse onto the ground or soil but under no circumstances into a pond or stream or onto a surface that leads directly to a water body, such as a storm sewer;
 - k) All rinsing activities at the site of the batch plant shall be done over a containment pond (approximately 12.2 m x 4.57 m and less than 0.91 m deep). The material used to form the bottom and sides of the pond can be compacted clay or a synthetic liner, however the DOEC shall approve any installation of a synthetic liner. The pond shall be self contained with no water inlets or outlets and no possibility of surface drainage into or out of the pond;
 - l) Any trucks returning with unused concrete shall dispose of this concrete into an approved area able to contain it while still in liquid form before the trucks can be washed. Once the concrete has hardened it may be used as fill material. Liquid concrete shall not be permitted to run freely over the ground;

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- m) Once all concrete has been removed from the truck, the truck may be brought over to the containment pond where washing can take place. Any water that is used to wash the truck shall be directed into the pond;
- n) When the water level in the pond reaches a height that necessitates discharge, water can be discharged following the procedure outlined in b) and c) above otherwise it shall be removed by pumper truck or undergo additional treatment; and
- o) Water shall not be discharged in an area where it would cause erosion or be able to pick up solids from the surface.

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5.30 Dust Control

Environmental Concerns

The environmental concerns associated with dust include effects on human health and aquatic ecosystems, waterfowl and vegetation.

Environmental Protection Procedures

The following measures shall be taken to mitigate potential effects of dust:

- a) Dust from construction activities shall be controlled where possible by using frequent applications of water. Waste oil shall not be used for dust control but other agents such as wood chips, calcium chloride, matting and re-vegetation shall be considered on a site-specific or as needed basis and shall require the approval of appropriate regulators;
- b) Environment Canada's Best Practices for the Use and Storage of Chloride-Based Dust Suppressants, (February, 2007) shall be followed for the application of chloride based dust suppressants. This includes but is not limited to:
 - i) Chloride based dust suppressants shall not be applied prior to a heavy rainfall or if rain is threatening for at least 36 hours;
 - ii) Dust suppressants shall be applied after a rainfall event to aid in mixing.
 - iii) Suppressants shall be applied during early morning or evening times to reduce evaporation; and
 - iv) Chloride suppressants shall not be applied to a bridge deck or paved surface.
- c) Dust control agents (wood chips, calcium chloride, matting, etc.) shall be stored at suitable distances from all watercourse, water body, or ecologically sensitive areas using proper Buffer Zones (Section 5.18).

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5.31 Noise Control

Environmental Concerns

A variety of noises associated with construction and operation activity can negatively affect wildlife and fish and can affect human safety and health. Noises associated with blasting are temporary in nature and noises associated with drilling are considered long-term, but localized.

Environmental Protection Procedures

Measures shall be implemented wherever possible to minimize potential effects arising from a variety of noise sources, including:

- a) Wildlife surveillance shall be conducted prior to and post noisy activities. Activities may be delayed until wildlife have been allowed to leave the area as directed by the On-Site Environmental Monitor;
- b) Adherence to all applicable permits and approvals;
- c) All equipment shall have exhaust systems regularly inspected and mufflers shall be operating properly in accordance with the manufacturers recommendations; and
- d) Low level flying of aircraft shall be avoided in areas where sensitive wildlife are present (i.e caribou, osprey, harlequin duck and other waterfowl).

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5.32 Resource Specific Mitigations

Environmental Concerns

Construction activities have the potential to impact a number of specific resources in the work areas of the Lower Churchill Project.. The resources are historical and archaeological resources, species at risk, forestry resources, land use, etc.

5.32.1 Historic and Archaeological Resources

Sites of historic or archaeological significance have been identified at the converter stations and electrodes (Component 3), and the HVdc Transmission Line (Component 4a). When working in areas of high potential for historic or archaeological sites, site-specific work measures shall be developed.

To date 124 archaeological sites have been identified in Historic Resources Studies for the proposed transmission corridor from Muskrat Falls to Soldiers Pond and the DC Specialties Sites.

Of the 124 sites that have been identified, 87 of these sites are considered to be outside the proposed boundaries and footprints the DC transmission line and DC Specialties sites, however awareness of the locations of these sites shall be maintained during construction activities.

Historic Resources activities/reviews are ongoing at Forteau Point and Churchill Falls and the results will be incorporated when available.

See Table 5-4 for information about the known sites within the project boundaries. Detailed maps showing the segments of the HVdc transmission line and the Labrador shoreline will be provided to the contractor to aide in the development of the *C-SEPP*.

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Table 5-4: Historical and Archaeological Resources in the Lower Churchill Region

Archaeological Registration Number/Name	Location	Environmental Effect	Contributing Project Activity
EiBf-20	HVdc Transmission line	Disturbance/ Loss	Transition Compound
EiBf-45**	HVdc Transmission line	Disturbance	Converter Station/ electrode/Transmission Line
EiBf-46**	HVdc Transmission line	Disturbance	Converter Station/ electrode/Transmission Line
EiBf-47**	HVdc Transmission line	Disturbance	Converter Station/ electrode/Transmission Line
EhBe-07**	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
EhBe-08**	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
EdBg-01	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
EbBi-01**	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
DhBf-01	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
DhBe-04	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
DfBa-13	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
EiBf-04**	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
EiBf-08**	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
EiBf-25**	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
EiBf-35**	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
EiBf-36**	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
EiBf-37**	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
EiBf-38**	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
EiBf-39**	HVdc Transmission line	Disturbance	Clearing of vegetation for TL

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Archaeological Registration Number/Name	Location	Environmental Effect	Contributing Project Activity
EiBf-40**	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
EiBf-43**	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
EiBf-44**	HVdc Transmission line	Disturbance	Clearing of vegetation for TL
EjBe-15	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-16	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-18**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-19	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-20	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBe-01**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBe-02**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBe-03**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBe-04**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBe-05**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBe-06**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-01**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line

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Archaeological Registration Number/Name	Location	Environmental Effect	Contributing Project Activity
EiBf-02	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-03**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-05**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-06**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-09**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-10**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-11**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-12**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-13**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-14**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-15**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-16**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-17**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-18**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line

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Archaeological Registration Number/Name	Location	Environmental Effect	Contributing Project Activity
EiBf-22**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-23**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-24**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-26**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-27**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-01**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-02**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-03	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-06**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-27**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-28**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-30**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-31**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-33	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line

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Archaeological Registration Number/Name	Location	Environmental Effect	Contributing Project Activity
EjBe-34	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-35	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-36	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-41**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-42**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-55**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-56**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-57**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-58**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-59**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-60**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-61**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-63	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-64**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line

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Archaeological Registration Number/Name	Location	Environmental Effect	Contributing Project Activity
EjBe-65**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBf-01**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBf-02**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBf-03**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBf-04**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBf-05**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBf-06	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBf-08**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBf-09**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBf-10**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBf-11**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBf-12**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBf-13**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBf-14**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line

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Archaeological Registration Number/Name	Location	Environmental Effect	Contributing Project Activity
EjBe-66**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-67	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-68	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-69	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-70	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-71	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-28**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-31**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-33**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-32**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-72	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-34**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-41**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-75	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line

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Archaeological Registration Number/Name	Location	Environmental Effect	Contributing Project Activity
EiBf-29**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-42**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-83	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-84	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EjBe-85	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EiBf-30**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EhBe-02**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
EhBe-04**	Labrador Shoreline	Disturbance/ Loss	Converter Station/electrode/Transmission Line
DfBa-02	Central/Eastern NL	Disturbance/ Loss	Converter Station/electrode/Transmission Line
DfBa-04	Central/Eastern NL	Disturbance/ Loss	Converter Station/electrode/Transmission Line
CIAl-04**	Avalon Peninsula	Disturbance/ Loss	Converter Station/electrode/Transmission Line
CiAf-02	HVdc Transmission line Avalon Peninsula	Disturbance/ Loss	Converter Station/electrode/Transmission Line
FfCa-01	HVdc Transmission line Southern Labrador	Disturbance/ Loss	Transmission Line
EiBf-49**	Forteau Point	Disturbance/ Loss	Transition Compound
EiBf-50	Forteau Point	Disturbance/ Loss	Transition Compound

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Archaeological Registration Number/Name	Location	Environmental Effect	Contributing Project Activity
EiBf-51	Forteau Point	Disturbance/ Loss	Transition Compound
EiBf-52	Forteau Point	Disturbance/ Loss	Transition Compound
EiBf-87	L'Anse Au Diable	Disturbance/ Loss	Electrode Site
EiBf-87	L'Anse Au Diable	Disturbance/ Loss	Electrode Site
EiBd-03	Shoal Cove	Disturbance/ Loss	Transition Compound

** These sites are outside the proposed boundaries of the DC transmission line and DC Specialties sites, however awareness of the locations of these sites shall be maintained during construction activities.

As per the requirements of the PAO, a historic and archaeological resources impact assessment shall be conducted at sites where historic and archaeological resources may be unearthed. For low potential sites a desktop review may be adequate. For higher potential sites, field assessment may be required.

Existing information shall be provided where available, and where activity will take place in an area that has not been previously reviewed a historic resources overview assessment may be required.

The following mitigations shall be implemented with respect to historic and archaeological resources:

- a) All persons on site shall be informed of the historic resources potential of the area, of their responsibility to report any unusual findings, and to leave such findings undisturbed;
- b) A site orientation to be attended by all staff and contractors this shall identify areas of high historic resources potential;
- c) The On-Site Environmental Monitor shall report to the PAO if any potential archaeological resources are uncovered during excavation (Martha Drake, Provincial Archaeologist, 709-729-2462);
- d) Where possible known sites shall be avoided by modifying design (i.e. road and transmission line alignment adjustment) to ensure a 50 m minimum buffer

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(actual size to be determined by the PAO). Where the site cannot be avoided, the site shall be recorded/recovered to the satisfaction of the PAO before work can proceed as per Historic Resources Management Plan developed by the ERC Team;

- e) The onsite environmental monitor shall be immediately contacted if any historical resources are discovered during the course of the work. All work within 50 m of the discovery location shall stop and contingency plan procedures implemented; and
- f) Regular monitoring shall be conducted by the On-Site Environmental Monitor to ensure that site protection measures are adequate and that the terms and intent of the P-WEPP requirements are being met. Sites registered with the PAO outside the immediate Project area shall be visited annually by the On-Site Environmental Monitor during periods when the sites are not snow covered to ensure they have been left undisturbed.

5.32.2 Species at Risk

Many wildlife species (including plants, animals and birds) and their habitat are protected under provincial and federal regulations such as the *National Species at Risk Act*, *Migratory Birds Convention Act* and the *NL Endangered Species Act*. Of primary concern are disturbances, destruction or degradation of critical habitat, recovery habitat and disturbance during critical life periods (i.e. nesting and spawning) Displacement of species due to construction activities (i.e. blasting) or encounters with construction equipment and personnel is also a concern.

Thirteen species have been identified through the Environmental Assessment process as being of concern in the HVdc transmission line right-of-way and the dc specialties sites. They include vegetation, furbearers, mammals, avifauna and waterfowl. They are as follows:

- a) Fernald's Braya (SARA threatened);
- b) Long's Braya (SARA endangered);
- c) Fernald's milk-vetch (SARA special concern);
- d) Boreal Felt Lichen (SARA special concern);
- e) American Marten, Newfoundland Population (SARA threatened);

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- f) Harlequin Duck (SARA special concern);
- g) Olive Sided Flycatcher (SARA threatened);
- h) Grey Cheeked Thrush (NLESA vulnerable);
- i) Rusty Blackbird (SARA special concern);
- j) Red Crossbill (SARA endangered);
- k) Short Eared Owl (SARA special concern);
- l) Common Nighthawk(SARA threatened);
- m) Woodland Caribou - Red Wine Mountains Herd and Mealy Mountains Herd (SARA threatened)
- n) Barrows Goldeneye (SARA special concern);
- o) Piping Plover (SARA endangered);
- p) Ivory Gull (SARA endangered);

Reference should be made to the fact sheets for species listed on the SARA list and the Endangered Species Act to find further information about these species.

A research permit for work around SARA listed species may be required from the Wildlife Division, Department of Environment and Conservation, Governmental of Newfoundland and Labrador. The following mitigations shall be implemented with respect to endangered, threatened or vulnerable wildlife at the site:

- a) Critical habitats shall be identified on site plans or plan profiles for roads and transmission lines for C-SEPP;
- b) All site personnel shall receive training to recognize any endangered, threatened or vulnerable species of plant or animal and its habitat prior to the start of clearing and any other site activities;
- c) Through site surveys, existing potential rare plants habitat shall be identified and mapped prior to the commencement of any site work. Based on this mapping, travel routes and “no-go” zones shall be established to avoid sensitive areas.

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Animals and animal habitats such as active nesting sites and beaver dams, shall also be identified and mapped;

- d) Work plans shall be submitted in advance and shall be reviewed for potential conflicts, including rare plants, endangered species, critical habitat and other areas of concern (i.e. beaver dams and nesting sites);
- e) Where required (i.e. as per the Avifauna Management Plan or associated EEM Plans), prior to commencement of work, an on-site wildlife biologist shall be on-site to survey for areas of concern (critical breeding habitat, rare plants, nest sites, etc.) and to provide input on work methods, lay out approved travel routes and work areas and associated buffer zones;
- f) In areas where concerns have been identified, the On-Site Environmental Monitor shall ensure work crews are aware of concerns identified and work methods to be used;
- g) There shall be no intrusion into “no-go” zones without prior permission of the On-Site Environmental Monitor;
- h) Crews shall not travel outside of marked work areas and trails. If markers are not clear or are missing, the On-Site Environmental Monitor shall be consulted prior to commencing or continuing with the work;
- i) The On-Site Environmental Monitor shall monitor work activity in sensitive sites at all times and provide advice on access and travel requirements;
- j) The Environmental Coordinator shall be informed of activities near sensitive areas so that they may notify any regulators;
- k) Notice of potential impacts to rare or protected species and their habitat at the job site shall be given to the On-Site Environmental Monitor for evaluation;
- l) Prior to construction during nesting season (May 15 to August 15) the area shall be surveyed for active nests including raptor and other SARA listed species listed in Section 5.30.2;
- m) No clearing shall take place within 800 m of an active raptor nest between the months of May 15 to August 15. If a nest is encountered during clearing

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activities, all work shall stop until the site is cleared by the On-Site Environmental Monitor, in consultation with the appropriate regulatory agencies;

- n) For all work activities other than clearing, a 200 m buffer shall be respected for active raptor nests from May 15 to August 15. Within this 200 m buffer zone the following applies, after consultation with the provincial government:
- Only essential vehicular activity shall be permitted;
 - Work shall only be permitted in the presence of the On-Site Environmental Monitor;
 - Crews shall cease work if there is a disturbance at a nest until activity at the nest has returned to normal; work shall not commence again until approval from the On-Site Environmental Monitor.
- o) Crews shall not establish a permanent or temporary camp within 800 m of a known raptor nest;
- p) If a tree containing an inactive nest is encountered during site clearing, the nest shall be assessed for viability and if the nest is deemed viable a platform shall be established as approved by the provincial government; and
- q) If a tree containing an inactive nest is encountered during the transmission line right-of-way clearing a platform may not be required as the transmission line tower will provide an alternative nesting site.

5.32.3 Wildlife Protection

The following mitigative measure shall be implemented for the protection of wildlife at the site:

- a) Construction activities shall be scheduled considering any sensitive areas of fish and wildlife habitat and critical periods in fish and wildlife cycles, and considering additional mitigation measures that may be required. Annual timing of migration, spawning and calving in the vicinity of the site shall be considered at all times;
- b) Personal pets shall not be brought to the construction site;

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- c) Buffer zones shall be implemented to protect wildlife at the site, see Section 5.7 for the buffer zones for helicopter traffic at the site;
- d) Fishing and hunting are prohibited at or near the construction site. All project participants shall be prohibited from fishing and hunting at or near the construction site while working on the project;
- e) Mitigation measures provided in various sections (e.g. Section 5.25 - Erosion Prevention and Sediment Control, Section 5.13 - Storage, Handling and Disposal of Fuel and Other Hazardous Material, Section 5.18 - Buffer Zones, etc) shall be consulted while working close to water to ensure that appropriate measures are understood and implemented to protect freshwater fish and fish habitat;
- f) Under no circumstances are wildlife to be fed and all measures shall be taken to avoid inadvertent feeding;
- g) Wildlife shall not be chased, caught, diverted, followed or otherwise harassed by project participants;
- h) All Wildlife sightings and nuisance wildlife shall be reported to the On-Site Environmental Monitor;
- i) The forestry branch shall be contacted and updated with regards to nuisance wildlife and wildlife encounters;
- j) Equipment and vehicles shall yield the right-of-way to wildlife and adhere to construction site speed limits;
- k) Environmental awareness training, with regular briefings, shall be implemented for all personnel;
- l) All persons on site shall be made aware of the potential for encounters with black bears and instructed to report all sightings to the On-Site Environmental Monitor;
- m) Black bear deterrent measures such as bear bangers and bear spray may be used, and translocation of bears shall be undertaken before any lethal means are considered. A research permit for relocation of bears may be required from the

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Wildlife Division, Department of Environment and Conservation, Government of Newfoundland and Labrador;

- n) Fire arms shall not be permitted on site, with exception of approved bear monitors;
- o) Black bear protection permits shall be obtained for each black bear monitor. Permits shall be signed by the individual that the permit is issued to;
- p) An Avifauna Management Plan has been developed by the ERC Team. The Plan includes:
 - Surveying for migratory bird nests prior to cutting during the nesting season;
 - Surveying for sensitive habitat that typically supports nest;
 - Information regarding avoiding identified nests until fledged;
 - Information regarding cutting in sensitive habitats during nesting season; and
 - Employing on-site support of qualified biologists during construction, as required.
- q) Clearing activities between May 15 and July 31 shall be in compliance with the Avifauna Management Plan; and
- r) No one shall disturb, move or destroy migratory bird nests. If a nest or young birds are encountered, work shall cease in the immediate area of the nest. Work shall not continue in the area until the nest is no longer occupied, otherwise the work plan shall be modified to avoid nest sites by a minimum of 30 m (100m for Rusty Blackbird).

Caribou

Several sensitive caribou areas are crossed by the HVdc line. These areas are identified on constraint mapping and in these areas the following mitigation measures apply:

During the calving (May 28 – July 1) and post calving seasons (July 2 – September 20) if caribou approach the worksite, it is proposed there be a progressive level of heightened awareness by Project personnel AND increased interaction with the Wildlife Division. Project personnel shall follow the following mitigation and monitoring measures (as outlined in the Caribou Management Plan):

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- a) The Wildlife Division of the NLDEC will notify the Project Manager should data from satellite collars indicate that caribou are within 20 km of the work areas;
- b) Upon notification of caribou within 20 km of work areas, surveys will be instituted within this radius. Initially a preference will be given to observations from fixed points along the high ground adjacent to Project activities. As an adaptive management measure, if ground-based surveys prove not to be useful or feasible, aerial surveys will be implemented at the construction sites;
- c) Sightings or reports of caribou, within 20 km of work areas and activities will be described in a one-page update of wildlife observations associated with the Environmental Protection Plan (EPP). This update will normally be sent by Nalcor Energy to the Wildlife Division in Goose Bay and Corner Brook on a bi-weekly basis (whenever Project activities are ongoing). Such updates will also be presented during environmental awareness training and regular briefings for all personnel;
- d) When caribou are known to occur within 20 km, a 5 km buffer around each area of activity will be monitored on a weekly basis by scanning for tracks or animals from road-accessible vantage points within this radius. Observations reported by personnel or others will also be recorded and investigated within this area. Reporting to the Wildlife Division would be increased to a weekly basis in this scenario. Note that if caribou are not seen within the 20 km radius, the 5 km buffer would be monitored on a bi-weekly basis (from road-accessible vantage points) over the course of the calving and post-calving period. If caribou are observed at a distance of less than 5 km from Project infrastructure and activities, Nalcor Energy will issue an advisory of their proximity to personnel to be alert, the monitoring from road accessible vantage points will increase in frequency to a daily basis by the on-site environmental monitor;
- e) While caribou are within 5 km of work areas and activities, all sightings of caribou will be reported to the on-site Environment Monitor, and will be immediately communicated to all vehicle operators. Caribou will not be blocked from crossing access roads or work areas. If caribou are crossing or attempting to cross the site roads, then traffic will stop and wait for them to cross;

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- f) Prior to primary blasting at the main site a wildlife survey will be conducted. If caribou are within 3 km of the site the blasting will be delayed until the caribou have left the area. Methods to encourage the caribou to leave the area will be utilized as agreed to and in consultation with the Wildlife Division. The 3km radius may be reduced based sound monitoring surveys, as agreed to by the Wildlife Division;
- g) For all other activities (vegetation clearing, grubbing, grading and levelling, laydown and storage of equipment and material in existing areas, generators to support the activity, vehicle and heavy equipment use, handling and transfer of fuel and other hazardous material, waste disposal, sewage disposal and hazardous waste disposal) which would not be audible beyond a short distance, if caribou approach to within site of the work area (up to maximum buffer of 500 m), the On-Site Environmental Monitor will determine if activities will need to be delayed or curtailed to allow the animals to proceed onwards beyond the work site. Such interactions will be included in the weekly reports to the Wildlife Department; and
- h) For activities related to transmission line construction (localized and low intensity blasting, tower erection and conductor stringing) which would not be audible beyond a short distance, if caribou approach to within site of the work area (up to maximum buffer of 500 m), the On-Site Environmental Monitor will determine if activities will need to be delayed or curtailed to allow the animals to proceed onwards beyond the work site. Such interactions will be included in the weekly reports to the Wildlife Department.
- i) Throughout the construction of the Project, Nalcor Energy will maintain communications with the provincial Wildlife Division, and other stakeholders and officials regarding the movements of the George River Herd and/or possible woodland caribou (e.g., Red Wine Mountains Caribou Herd) sightings in the Project area.
- j) For work areas outside the sensitive caribou areas, and outside sensitive times (May 28 to September 20) any Caribou observed or encountered near a work

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area shall be reported to the On-Site Environmental Monitor and additional mitigation measures will be implemented, if required.

5.32.4 Muskrat Falls Rock Knoll

Construction activities conducted to reduce interaction with rock knoll to extent practical, in consultation with the Innu Nation through the EMC.

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5.33 Commissioning

Environmental Concerns

Commissioning occurs after installation and prior to release for commercial operation; it is a means of verifying and documenting that each component, system and assembly of a facility is built, installed and tested as planned and designed to meet Project requirements.

Commissioning the proposed HVdc transmission lines is related to mechanical acceptance so that all hardware is in place and properly installed.

After mechanical completion of the HVdc and synchronous condenser facilities final commissioning is completed in two stages. The first stage is static commissioning which consists of systematically testing individual components or sections of a completed system using test equipment voltages and currents. This process will take about 6 months at each converter station and at the synchronous condenser facility, about 3 months at each transition compound and about 1 month at each shoreline pond electrode site. The second stage is dynamic commissioning which consists of operational performance testing while connected to the existing network and operating near full operating conditions. This process will take about two months and will include all sites noted above.

Temporary telecommunication construction related infrastructure requires commissioning that will also include static and dynamic commissioning and will take approximately 3 weeks at each facility (switchyards, converter stations, transition compounds, electrode sites, construction camps and marshalling yards). Permanent telecommunication construction related infrastructure requires similar commissioning, however the timeline will be approximately 3 months at each facility (switchyards, converter stations, transition compounds, electrode sites, construction camps and marshalling yards).

Environmental concerns related to commissioning relate to unintended release of hydrocarbons into the environment.

Environmental Protection Procedures

- a) All equipment containing fluids shall be checked for leaks by the supplier and/or manufacturer and shall be tested according to the manufacturer's directions prior to commissioning activities;

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- b) There shall be monitoring during commissioning for spills and/or leaks;
- c) Appropriate spill kits shall be on hand to respond to a spill or leak (see Section 5.13);
- d) In the event that a spill or leak is detected, the Master Spill Response Plan (within the ERP) shall be referred to for response to any incidents; and
- e) All other requirements of this P-WEPP shall be adhered to during commissioning.

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5.34 Site Rehabilitation

Environmental Concerns

The primary concern with environmental rehabilitation is site stabilization and erosion prevention. This is particularly pertinent in regards to temporary structures such as roads, quarries, cofferdams, etc.

Environmental Protection Procedures

Environmental rehabilitation shall be consistent with all applicable standards, codes, acts and regulations and the conditions of EA release.

General rehabilitation approaches are provided in this section however specific rehabilitation approaches shall also be developed in compliance with regulatory requirements and industry best practice and shall be completed on a site by site basis and included in the C-SEPP. An outline of the requirements of the site-specific rehabilitation plan is provided below.

5.34.1 Site-Specific Rehabilitation Plan

The following outlines the requirements of the Site-Specific Rehabilitation Plan:

- a) Removing and stockpiling overburden and organic material for re-use;
- b) Re-grading areas to control erosion and establish suitable drainage;
- c) Replacing the overburden and organic material to produce conditions for re-growth; and
- d) Encouraging natural re-vegetation, or re-planting with suitable vegetation.
- e) On some sites there may be limited overburden and organic matter. Nutrient poor soils and a shorter growing season may also slow down and reduce the rate of vegetation re-establishment. In these cases it may be necessary to import seed, mulch or geotextiles to artificially improve revegetation for key areas. Measures to prevent the invasion of disturbed sites by non-native plant species shall be considered. Acceptable approaches include, but are not limited to:
- f) Use of native plant and soil material for rehabilitation and re-vegetation;
- g) Use of only species that are non-aggressive and non-persistent (where local plants are not available or shall not meet the rehabilitation objectives).

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- h) Implementation of measures to ensure that additional materials (required to limit erosion, reduce sedimentation or enhance establishment) are weed and disease free; and
- i) Equipment coming from other regions or provinces shall be clean and free of potential seed sources of invasive plants.

All areas of the construction sites shall require careful consideration of the landscape within which the work is taking place, to ensure that the correct approach is taken. Areas shall be prioritized in terms of need and importance and the level of rehabilitation shall be modified accordingly. Factors that shall be considered in determining the rehabilitation approach include, but are not limited to:

- a) Site and public safety (including future access requirements);
- b) Sedimentation concerns and proximity to water bodies;
- c) The natural habitat of the area (i.e. vegetation, soil, hydrology, etc.);
- d) Wildlife habitat considerations;
- e) Riparian habitat considerations;
- f) The productivity of the site (i.e. moisture, content and nutrient regime) and its effect on re-vegetation;
- g) The availability of materials and implications of importing unnatural material;
- h) Land use and their effect on success of rehabilitation techniques; and
- i) Overall cost of rehabilitation measures.

Once the schedule of work at each construction area has been developed, a detailed schedule for carrying out rehabilitation work shall be developed in accordance with regulatory requirements and shall also consider industry best practice for implementation of site rehabilitation. The site-specific rehabilitation plan shall indicate timing of the rehabilitation works for each area to be rehabilitated. Consideration shall be given to progressive rehabilitation throughout the construction period, as opposed to waiting for the end of construction before starting with rehabilitation.

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5.34.2 General Measures

- a) Rehabilitation shall be required for all temporary works including roads, stream crossings, camps and quarry and borrow areas;
- b) No temporary buildings or structures associated with the work shall be left on site upon completion of the work;
- c) All solid waste, including petroleum, oil and lubricant containers shall be removed from site;
- d) Pre/Post occupation inspection shall be completed; and
- e) The On-Site Environmental Monitor shall prepare a report for all sites documenting site conditions prior to disturbance and upon site abandonment and rehabilitation. Each report shall include a description of the condition of vegetation and other aspects of natural environment.

Quarry/Borrow Areas

The following measures are specific to quarry and borrow areas and shall be considered in rehabilitation plans for those areas:

- a) Any organic material or overburden removed during development of the borrow pits and quarries shall be stockpiled near the pit or quarry area for future use during rehabilitation of the borrow pit or quarry. Overburden (and non-PAG rock) that is not suitable for rehabilitation purposes shall be stockpiled for temporary use or permanent disposal. Stockpiling shall be in stable configurations and contoured to match the surrounding landscape. For temporary stockpiling it shall be and returned to the borrow pit or quarry opening once extraction from the pit or quarry is complete;
- b) As site conditions dictate, vegetation or other cover materials may be established on slopes to control erosion and dust (as outlined in Section 5.25, Erosion Prevention and Sediment Control). Quarries and pits reclaimed during operations may be used as test plots to evaluate suitable re-vegetation techniques to be used for the rehabilitation of other work areas in the future;

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- c) Arrangements shall be made with the representatives of the Department of Natural Resources for an inspection to be conducted prior to abandonment of the site;
- d) All equipment and material shall be removed from the site;
- e) All pit and quarry slopes shall be graded to slopes less than 20%, or to a slope conforming to that existing prior to quarrying;
- f) Excess overburden may be used for sloping but topsoil or organic material may not be used for sloping. Following sloping, topsoil or organic material may be spread over the entire quarry area to promote vegetation; and
- g) Quarry conditions, including slope on rock walls, shall be determined through the Rehabilitation Plan. Each quarry shall be evaluated on a site-specific basis to determine if cliff faces should be converted to rubble slopes.
- h) Roads/Stream Crossings
 - i) The following measures are specific to road and culvert/bridge rehabilitation and shall be considered in rehabilitation plans for those areas:
 - j) The contractor shall submit a plan for controlling erosion during rehabilitation activities. This plan would address construction activities that have the potential for stream sedimentation;
 - k) When working in a stream or water body, remove all fill around pipes before water bypass installation and pipe removal;
 - l) The stream shall be dewatered at the site using a non-eroding, water tight diversion during excavation. Settling basins shall be used to ensure that muddy water does not enter the water body;
- m) Fill material that requires temporary placement shall be placed in stable areas outside of stream channels and flood plains;
- n) Channel banks shall be armoured with large rock, woody debris and vegetation when needed;

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- o) Channel and vegetation rehabilitation shall be required if there are disturbances upstream and downstream of the stream crossing site;
- p) Stream channels shall be restored to natural grade and dimensions and re-vegetation may be required;
- q) All culverts shall be removed;
- r) Temporary bridges in all areas of the site shall be removed; and
- s) Removed culverts and other structural materials shall be disposed of as per the WMP.

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6 ENVIRONMENTAL MONITORING AND FOLLOW UP

6.1 Environmental Compliance Monitoring

To ensure that appropriate and effective environmental mitigation measures are employed during construction, the project shall have full-time On-Site Environmental Monitors at various construction sites. These individuals shall continuously inspect worksites and activities for conformance with the P-WEPP, C-SEPPs, engineered mitigation measures required by design; and compliance with government regulations and permits.

This P-WEPP establishes the basis for environmental compliance monitoring at the Project site, i.e. monitoring for regulatory compliance to verify that conditions of all permits and approvals are satisfied, and that all environmental regulatory requirements are met. Refer to the Regulatory Compliance Plan (RCP) for further information on regulatory compliance for the Lower Churchill Project.

Non-conformance with this P-WEPP and/or non-compliance with permits, approvals, and regulatory requirements shall be documented as indicated in the following paragraphs and in the RCP and addressed with the contractor responsible for mitigation measures. Corrective action shall be identified, target dates shall be agreed upon, and responsibilities shall be assigned to appropriate personnel. This documentation shall be distributed to other members of the Project's environmental management team and written notice of agreed corrective action will be forwarded to the contractor so that issues are resolved to the satisfaction of the Project's environmental management team.

If non-conformance items are noted that require immediate attention, or if agreed corrective action is not implemented in a timely and effective manner, then appropriate resources shall be contracted by the project to immediately undertake the required action.

Daily Field Reports shall be prepared by the On-Site Environmental Monitor/Coordinators and distributed to the Construction Manager, the Environmental Engineering Manager and the Contractor. These reports shall describe the work being undertaken by the Contractor, and document incidents of non-conformance with environmental requirements. An example of the Daily Field Report checklist is located in Section 8.

The Environmental Coordinators, in consultation with project staff and the Contractor, shall prepare quarterly Environmental Compliance Audit Reports (i.e. 1 audit report/quarter for the

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Hydro component, and 1 audit report/quarter for the Transmission Line components). The reports shall document all incidents of non-compliance and their causes. The Environmental Coordinators shall distribute the Environmental Compliance Audit Reports to relevant Project participants. The Environmental Coordinators shall be responsible for managing the Non-Conformance Registry, including updating it regularly, and incorporating all conditions into the Registry to ensure that these are complied with in a timely manner.

The contractor shall be responsible for developing a site-specific Compliance Monitoring Plan to be included in the C-SEPP. This shall include such things as frequency of monitoring, parameters, locations and media to be monitored, etc. All analysis conducted to support compliance monitoring are subject to the Accredited Laboratory Policy.

6.2 Environmental Effects Monitoring

The intent of Environmental Effects Monitoring (EEM) is to confirm predictions made as part of the environmental assessment.

EEM monitoring shall be carried out by the ERC Team. The EEM program results shall be communicated to the ECR Manager by the Environmental and Regulatory Compliance Lead.

Should effects deviate from predicted, the ERC Team shall determine the cause and appropriate action. Should this information be linked to work practices, the P-WEPP shall be revised and updates shall be provided to contractors and staff.

It is noted that there may be additional requirements for approvals and communication with the regulators related to the EEM Plan.

6.3 Annual Environmental Performance Review

At the end of each construction year the project shall convene an environmental performance workshop to review all work activities that relate to environmental concerns, issues and/or mitigations. This workshop will include a review of environmental audits carried out by project staff during the year. The review process shall give all parties a chance to evaluate overall environmental performance and compliance with government regulations, permits, this P-WEPP, and C-SEPPs.

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7 CONTINGENCY PLANS

Contingency plans to address unplanned occurrences and emergency situations are provided in the following sections. The following unplanned occurrences and emergencies have been addressed under contingency plans:

- Fuel and Hazardous Material Spills (Master Spill Response Plan within the ERP)
- Wildlife Encounters (including nesting and denning sites)
- Historic and Archaeological Resources
- Forest Fires (ERP)

7.1 Fuel and Hazardous Materials Spills

Spills of fuel and/or hazardous materials can potentially be harmful to human health and safety, vegetation, soil, surface water, ground water, wildlife, aquatic organisms, historic resources and human health and safety.

In case of a fuel or hazardous material spill project staff shall refer to the Master Spill Response Plan within the ERP for detailed contingency measures. A site-specific fuel and hazardous materials response plan shall form part of the C-SEPP.

To mitigate environmental effects of fuel and hazardous material spills and leaks, Contractors shall at all times maintain in good condition at least one spill kit dedicated to each piece of fuel-powered equipment. Each spill kit shall be located on the equipment and stored in a weather-proof container. Each spill kit shall have an absorption capacity of no less than 23 litres. In addition to equipment-dedicated spill kits, the Contractor shall at all times maintain in good condition spill response caches that are accessible within 15 minutes travel of all work faces and in the immediate vicinity of fuel/hazardous materials storage areas. Each cache shall have sufficient absorption capacity for one thousand (1000) litres of fuel or hazardous liquids (see Section 5.13 for more details on spill kits).

7.2 Wildlife Encounter

Wildlife encounters pose a potential risk for stress or injury to both the wildlife and site personnel. To reduce the risk and stress, control measures and environmental protection procedures have been put in place and are shown below. As a protection measure, hunting, trapping or fishing by Project personnel is not permitted on site.

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The following procedures shall be implemented on site to prevent the attraction of wildlife to the Site:

- a) Site and working areas shall be kept clean of food scraps and garbage;
- b) Animal proof disposal containers shall be used and will be regularly emptied and transferred to an approved waste disposal site (as per WMP); and
- c) No personal pets, domestic or wild, shall be allowed on the site.

In the case of wildlife encounters the following shall be implemented:

- a) No attempt shall be made by any worker at the project site to chase, catch, divert, follow or otherwise harass wildlife by vehicle or on foot;
- b) Equipment and vehicles shall yield the right-of-way to wildlife;
- c) Any wildlife sightings or encounters shall be reported to the On-Site Environmental Monitor;
- d) The On-Site Environmental Monitor shall be responsible for all actions in response to nuisance animals, including the use of firearms by bear monitors in the project area. A research permit for relocation of nuisance animals may be required from the Wildlife Division, Department of Environment and Conservation, Government of Newfoundland and Labrador.
- e) If the nest of any bird is encountered during construction and operation activities, work around the nest shall be stalled until the Wildlife Division has assessed the situation and appropriate mitigation is applied;
- f) Any incidents that result in the displacement or killing of wildlife shall be reported to the On-Site Environmental Monitor complete with details on the incident and the names (and contact information) of the persons involved; and
- g) In the event of a bear encounter project personnel shall follow the procedures as outlined in the Bear Awareness Training.

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7.3 Historic and Archaeological Resources

Historic resource material that is disturbed, destroyed or improperly removed from a site represents a potential cultural loss of information and history that could otherwise be handled and interpreted in an efficient and appropriate manner.

In case of a suspected discovery of an archaeological site or artefact the following procedures shall apply:

- a) Archaeological materials encountered shall be reported initially to the On-Site Environmental Monitor. The On-Site Environmental Monitor shall then immediately report this to the On-Site Environmental Coordinator, the Environmental Engineering Coordinator, and Construction Manager. The latter shall report to the Site Manager. The Provincial Archaeologist at PAO (Martha Drake, Provincial Archaeologist, 709-729-2462) shall be informed of the discovery by Environmental Engineering Coordinator with the following information:
 - i) Nature of activity;
 - ii) Nature of the material discovered; and
 - iii) Precise location of the find.
- b) Under the *NL Historic Resources Act* (1985), all archaeological sites and artefacts are the property of the Crown, and shall not be disturbed. The project shall take all reasonable precautions to prevent employees or other persons from removing or damaging any such objects or sites. Persons in contravention may be held liable for prosecution under Section 35.1 and 35.2 of the *Historic Resources Act RSNL1990, c. H-4*. Personnel working in the vicinity shall be advised of the find, including the On-Site Environmental Monitor. The site area shall be flagged for protection and avoidance;
- c) All work shall cease within 50 m of the discovery until the ERC team advises the PAO of the discovery. The PAO, in consultation with the ERC team shall provide direction regarding the discovery and may authorize a resumption of the work. If required, a full archaeological assessment shall be conducted of the site and immediate area; and

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- d) The PAO shall assess the significance of the discovery and determine if mitigation is required. The ERC team in consultation with the PAO shall develop mitigation measures and advise the PAO of any such measures.

7.4 Forest Fires

Construction for the development of the Lower Churchill may have activities that increase the risk of fire in the natural environment. Fires on site could spread to the surrounding area and forest. The main concerns include human health, damage to vegetation, wildlife and air and water quality. In case of a forest fire project personnel shall refer to the Emergency Response Plan for detailed contingency measures.

The operator shall take all precautions necessary to prevent fire hazards when working at the site. These include but are not limited to:

- a) An Operating Permit shall be required during the forest fire season;
- b) All flammable materials shall be stored and handled properly; and
- c) All flammable waste shall be appropriately disposed of on a regular basis;

In the case of a fire being encountered the following shall be implemented:

- a) The Site Manager shall appoint a supervisory staff member as "On Scene Commander" for fighting any forest fires;
- b) Immediate steps shall be taken by the operator and contractors on site to contain or extinguish the fire. Applicable personnel shall be trained in fire fighting and the use of such equipment. Equipment shall be provided in proper operating condition to suit the labour force and shall comply with manufacturer's standards;
- c) Fires shall be immediately reported to the Site Manager who will in turn report it to the applicable authorities (1-866-709-3473). The following information is required when reporting a fire: name and telephone number, time of detection of fire, size of fire, location of fire, weather conditions (rain, sun, wind direction and speed, etc.);
- d) Sufficient firefighting equipment to suit the labour force and fire hazards shall be provided by the contractor. Equipment shall be provided as specified in the

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forest fire regulations and Operating Permit and shall include shovels, back tanks and axes. Such equipment shall comply with and be maintained to the manufacturer’s standards. Project personnel shall be trained in the use of such equipment;

- e) During the fire season, ATV’s shall be equipped with a fire extinguisher or suitable equivalent containing a minimum of 227 grams of ABC dry chemical. Other machinery and equipment shall be equipped with a fire extinguisher containing a minimum of 4.5 kilograms of ABC dry chemical;
- f) The forest fire suppression equipment referred to in the Operating Permit shall be provided at the operating site in the following ratio:

Table 7-1: Forest Fire Suppression Equipment Requirements

Employees	Back Tank Pumps	Axes or Pulaski Tools	Grubbers or Shovels
5 or less	1	1	1
6-10	2	2	2
11-15	3	3	3
16-20	4	4	4
>20	Add 1 back tank pump, 1 axe or Pulaski tool and 2 grubbers or shovels to the above figure for each group of 5 additional employees or fraction of that number of employees. The back tank pump must have a capacity of 20 litres and be of a type approved by the forest service.		

- g) The contractor is required to ensure all fire pumps are approved by forest services, and all approvals shall be documented;
- h) When the number of employees reaches 20 or over, one fully functional forest fire pump, such as the Wajax Mk3, shall be available at the site. Pump accessories shall include: a gated “Y” valve, hose strangler and two nozzles for each unit, additionally, 610 meters of forest fire hose shall be available for each unit. If there are greater than 40 employees, two of these systems are required;
- i) The forestry official issuing the operating permit may specify deviations from the equipment requirements should local operating conditions warrant deviations;
- j) The actual location of the forest fire suppression equipment in relation to the operating site may be designated by the forestry official issuing the permit;

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- k) A copy of the operating permit shall be on the operating site and shall be shown when requested by a forestry official;
- l) The operating permit may be temporarily suspended by a forestry official if the fire weather index for that locality rises to high or extreme;
- m) Where a forest fire occurs on forest land in an area where logging or industrial operations are being carried out the person/s carrying out the operations shall immediately notify the nearest forest management district office or ranger station and commence fighting the fire with all labour, materials, equipment and facilities at his or her disposal until relieved of this responsibility by a forestry official or the fire is extinguished; and
- n) For additional information regarding forest fire contingency planning, refer to the ERP.

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8 REFERENCE DOCUMENTS

Information and documents referenced in this P-WEPP can be found at the LCP Project Office in St. John's and are all publically available documents. DFO Operational Statements and Factsheets as well as DOEC Environmental Guidelines and Federal Government Regulations are included in a reference material document (document # GV-0003-01). A listing of the key reference material is provided below:

Provincial Government Guidelines (Water Resources Division, DOEC)

- *Environmental Guidelines for Watercourse Crossings;*
- *Environmental Guidelines for Stream Crossings by All-Terrain Vehicles;*
- *Environmental Guidelines for Bridges;*
- *Environmental Guidelines for Culverts;*
- *Environmental Guidelines for Fording;*
- *Environmental Guidelines for Diversions, New Channels, Major Alterations;*
- *Environmental Guidelines for Pipe Crossings; and*
- *Environmental Guidelines for General Construction Practices.*

DFO Operational Statements

- *Aquatic Vegetation Removal in Freshwater Systems Operational Statement;*
- *Beaver Dam Removal Operational Statement;*
- *Bridge Maintenance Operational Statement;*
- *Clear Span Bridges Operational Statement;*
- *Culvert Maintenance Operational Statement;*
- *Dock and Boathouse Construction Operational Statement;*
- *High Pressure Directional Drilling Statement;*
- *Ice Bridges and Snow fills Operational Statement;*
- *Isolated Pond Construction Operational Statement;*
- *Maintenance of Riparian Vegetation in Existing Right-of-ways Operational Statement;*
- *Overhead Line Construction Operational Statement;*

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- *Punch and Bore Crossings Operational Statement;*
- *Routine Maintenance Dredging Operational Statement; and*
- *Underwater Cables Operational Statement.*

DFO Fact Sheets

- Fact Sheet on Effects of Silt on Fish and Fish Habitat;
- Fact Sheet on Blasting – Fish and Fish Habitat Protection;
- Fact Sheet on Ditching;
- Fact Sheet on Temporary Fording Sites;
- Fact Sheet on Forwarder Trails;
- Fact Sheet on Filter Fabric;
- Fact Sheet on Rock Check Dam;
- Fact Sheet on Temporary Bridges;
- Fact Sheet on Resource Road Construction;
- Fact Sheet on Instream Work in the Dry – Cofferdams;
- Fact Sheet on Streambank Stabilization;
- Fact Sheet on Instream Work in the Dry – Temporary Diversion;
- Fact Sheet on Instream Work in the Dry – Elevated Pipes;
- Fact Sheet on Culvert Stabilization;
- Fact Sheet on Storm Drain Outlets;
- Fact Sheet on Temporary Settling Basins;
- Fact Sheet on Bridge Construction/Demolition;
- Fact Sheet on Freshwater Salmonid Habitat Requirements;
- Fact Sheet on Highway Construction/Upgrading – Infilling, Stabilization and No-Grub Zones;
- Fact Sheet on Freshwater Intake End-of-Pipe Fish Screen;
- Fact Sheet on Stream Clean-up;
- Fact Sheet on Timber Crib;
- Fact Sheet on Water and Sewer Installation – Stream Crossings;
- Fact Sheet on Culvert Installation; and

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- Fact Sheet on AVTs, Fish Habitat and You

Other Pertinent Federal Documents

- Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters, Wright and Hopky, 1998;
- Freshwater Intake End-of-Pipe Fish Screen Guidelines, Fisheries and Oceans Canada, 1995;
- Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and Labrador. Fisheries and Oceans Canada, St. John's, NF, Gosse, M.M., et. al. 1998;
- Standard Methods Guide for the Classification/Quantification of Lacustrine Habitat in Newfoundland and Labrador, Bradbury C., et. Al. 2001;
- Forestry Guidelines for the Protection of Fish Habitat in Newfoundland and Labrador, Scruton, D.A., et. al. 1997; and
- Standard Methods Guide for Freshwater Fish and Fish Habitat Surveys in Newfoundland and Labrador Rivers & Streams, Sooley, Darrin R. 1998.

Other Pertinent Provincial Documents

- NL Water Resources Act;
- Accredited Laboratory Policy (PD:PP 2001-01.02)
- Environmental Policy for Infilling Bodies of Water W.R. 91-1 (*Water Resources Act*, DOEC);
- Environmental Policy for Land and Water Developments W.R. 95-01 (*Water Resources Act*, DOEC);
- Environmental Policy for Development in Shore Water Zones W.R. 97-1 (*Water Resources Act*, DOEC);
- Environmental Policy for Development in Wetlands W.R. 97-2 (*Water Resources Act*, DOEC);
- Environmental Code of Practice for Concrete Batch Plant & Rock Washing Operations (Department of Environment and Lands);
- Newfoundland and Labrador Species at Risk Data Sheets; and

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- *Motorized Snow Vehicles and All-Terrain Vehicles Regulations* (NL Department of Natural Resources).

Nalcor's References

Nalcor's Project reports provide information in support of the P-WEPP. Such information is a useful and key source of information for the overall documentation of environmental performance throughout the life of the Project. The documentation is listed below:

- Nalcor Energy's Environmental Policy and Guiding Principles;
- Lower Churchill Hydroelectric Generation Project - Environmental Impact Statement, Nalcor Energy, 2009;
- Information Responses, Lower Churchill Project, 2009;
- Information Responses, Lower Churchill Project, 2010;
- Standard Operating Procedures, AMEC Earth & Environmental Ltd., Large River/Waterbody De-Watering and Fish Relocation;
- Standard Operating Procedures, AMEC Earth & Environmental Ltd., Pond De-Watering and Fish Relocation; and
- Labrador-Island Transmission Line, Environmental Assessment, Historic and Heritage Resources Component Study, May 2011.

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9 CONTACT LIST

LCP General Information:

1-888-576-5454

lowerchurchill@nalcorenergy.com

DOEC Water Resources – St. John’s:

(709) 729-5713

DOEC Crown Lands - Happy Valley/Goose Bay:

(709) 896-2488

DOEC Wildlife Division:

(709) 637-2029

DFO: Habitat Management – Labrador:

709-896-6193

DNR Forestry Division:

(709) 497-8479

DNR Mines Division:

(709) 729-6447

Service NL, GSC - Happy Valley/Goose Bay:

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(709) 896-5471

Provincial Archaeology Office:

709-729-2462

Environment Canada Environmental Emergency Report Line:

709-772-2083 or 1-800-563-9089.

Town of Happy Valley Goose Bay

709 896 3321



Supplier/Contractor Document Requirements

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<p>Comments:</p> <p>This document supersedes LCP-SN-CD-0000-IM-PR-0002-01, Rev C3 (SLI No. 505573-0000-37AG-I-0015)</p>	<p>Total # of Pages: (Including Cover): 24</p>
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Status / Revision	Date	Reason for Issue	Prepared by	Functional Manager Approval	Quality Assurance Approval	Project Manager (Generation + Island Link) Approval
C1	16-Dec-2013	Issued for Construction	N. Collins	D. Green	D. Green	R. Power

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INTER-DEPARTMENT/DISCIPLINE APPROVAL (where required)

	Department Manager Approval	Date
RFO		
	B. Barnes	

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0 SUMMARY OF CHANGES

General Update throughout document	Document number superseded from contractor document to LCP PT number
	Removal of SLI and EPCM contractor to reflect organizational integration.
	General formatting and use of current template
Appendix A – Supplier Document Front Sheet – (LCP-SN-CD-0000-IM-PR-0002-01 Appendix A)	Removed from procedure. New reference to the Document Front Sheet for Suppliers/Contractors LCP-PT-MD-0000-IM-FR-0001-01.
Appendix B – Drawing Templates	Removed from procedure. New reference to the Drawing Templates for Suppliers/Contractors LCP-PT-MD-0000-IM-FR-0002-01.
Appendix C – Document Control Aconex User Guide	Removed. Now part of the Starter KIT.
Appendix D – Final Documentation Chart	Removed.
Appendix E – Binder Cover	Removed from procedure. New reference to the Binder Cover Pages for Final Documentation LCP-PT-MD-0000-IM-FR-0009-01.
Appendix F – Major equipment list and supply chain information	Removed from procedure
Appendix G – Table of Contents for Installation, Commissioning, Operations and Maintenance Manual and Manufacturer’s Record Book	Removed from procedure. New reference to the: Installation, Commissioning, Operations and Maintenance Manual Table of Contents - LCP-PT-MD-0000-IM-FR-0004-01, Manufacturer’s Record Book Table of Contents - LCP-PT-MD-0000-IM-FR-0006-01 Dispatch Dossier - LCP-PT-MD-0000-IM-FR-0008-01
Appendix H – Example of the Binder Spine Templates	Removed from procedure. New reference to the Binder Spines for Final Documentation LCP-PT-MD-0000-IM-FR-0005-01.
Accessing Aconex	Added

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1 PURPOSE

The purpose of this procedure is to define the responsibilities and methodology required to control the submission of Supplier/Contractor technical documents identified in the Supplier/Contractor Documents Requirements List (SDRL) as required for the Lower Churchill Project (LCP). This includes coding of technical documents and submission process for documentation being reviewed through to final handover.

2 SCOPE

This procedure applies to all Supplier/Contractors that provide goods or services for the Lower Churchill Project. The Supplier/Contractor shall transmit all documentation to LCP Document Control (LCPDCC) using LCP Aconex transmittal.

This procedure will provide all the details and submission requirements for Supplier/Contractor technical (revision controlled) document and drawing deliverables as listed on the approved SDRL defined for the project scope of work.

3 DEFINITIONS

Aconex	Electronic Document Management System which is a secure on-line platform for storing, managing and distributing project information for the Lower Churchill Project.
As-Built Documentation	Technical (Revision Controlled) Documentation where mark-up information has been formally incorporated into a new revision of the original document.
CA	Contract Administrator is responsible for managing the Agreement and Contract Administration from Award through to Completion.
Documentation	Documentation is any communicable material that is used to describe, explain or instruct regarding some attributes of an object, system or procedure, such as its parts, assembly, installation, maintenance and use.
Supplier/Contractor	Firm, corporation, organization, company, etc. with a scope of work under a purchase order, contract or agreement for the LCP.
SDRL	Supplier/Contractor Document Requirements List indicates the document and data requirements, timing of submissions, types of review, as-built requirements, handover deliverables and any requirements for inclusion in final documents/manuals.

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SDRL Code	A 3-character alpha-numeric code representing document types. e.g.: B01 = General Arrangement and Layouts.		
SDR (A01)	Supplier Document Register (A01) - documents list identifying individual document deliverables by purchase order. This register will capture deliverable requirements as agreed by Contractor/Supplier and Company. Contractor/Supplier is responsible to create and approve this document as a revision controlled document.		
OCR	Optical Character Recognition is text recognition software (Adobe Standard) that is used to convert electronic files to PDF format.		
Portable Document Format (PDF)	Portable Document Format (PDF) is a file format used to represent documents in a manner independent of application software, hardware, and operating systems. Each PDF file encapsulates a complete description of a fixed-layout flat document, including the text, fonts, graphics, and other information needed to display it.		
Supplier/Contractor Documents	Documents that a Supplier/Contractor issue to LCPDCC for Review and Acceptance by LCP Project Team such as drawings, parts list, calculations, procedures, reports and manuals pertaining to the contract, purchase order or agreement.		
Red-line drawing	A red-line drawing is essentially an intermediate drawing that shows corrections or changes to a previous drawing. The term red line literally comes from the (typically) red pen used to amend the drawings by hand. These mark-ups show changes made to the drawing subject matter during the manufacturer or construction of the product. Red-lines are used to then develop record drawings. Record drawings, also called "as-builts" accurately reflect what was constructed and are used for future work and/or reference.		
Retained Documentation	Documents/Drawings which are designated to be held by the Supplier/Contractor for a designated period of time.		
Responsible Lead / Package Engineer (PE)	The person who is responsible for the package awarded to Supplier/Contractor and Interdisciplinary Coordination (IDC) Review of Supplier/Contractor Documents.		
Revision Controlled Documents	A document deliverable resulting from a service related contractual relationship or a Supplier/Contractor document created in support of engineering, construction, procurement, manufacture, preservation, installation, commissioning and operation.		

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LCPDCC	Lower Churchill Project Document Control Centre.	
Starter Kit Templates	LCP-PT-MD-0000-IM-FR-0001-01	Document Front Sheet for Suppliers/Contractors
	LCP-PT-MD-0000-IM-FR-0002-01	Drawing Templates for Suppliers/Contractors
	LCP-PT-MD-0000-IM-FR-0003-01	SDR Template (A01)
	LCP-PT-MD-0000-IM-FR-0004-01	Installation, Commissioning, Operations and Maintenance Table of Contents Template
	LCP-PT-MD-0000-IM-FR-0005-01	Manual Binder Spine Templates for Final Documentation
	LCP-PT-MD-0000-IM-FR-0006-01	Manufacturing Record Book Table of Contents Template
	LCP-PT-MD-0000-IM-FR-0008-01	Dispatch Dossier Table of Contents Template
	LCP-PT-MD-0000-IM-FR-0009-01	Manual Binder Cover Pages for Final Documentation
	LCP-PT-MD-0000-IM-FR-0010-01	Major Equipment and Supply Chain Information
	Superseded	The information from a document that is now to be found on another document. Contractors/Suppliers are to make the appropriate cross-references both on the superseded document and the Supplier Document Register.
Transmittal	Tracks and establishes a history of documentation transfer to and from Suppliers/Contractors through Aconex.	
Void	The information on the document/drawing is no longer valid and/or in use.	

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ICOM (R01)	<p>Installation, Commissioning, Operating and Maintenance Manual – an organized compilation of documents and data as per the following sections:</p> <ol style="list-style-type: none"> 1. Installation section shall include all erection/assembly drawings, instructions as to the use of special tools provided, tolerances allowed on setting dimension, handling and unpacking instructions. Also includes quantities of preservatives and fluids required for shipment. 2. Commissioning section shall include list of spare parts, special tools and utilities required, pre-commissioning checks to be performed, sequenced procedure for dynamic commissioning and start-up and fault finding guidelines. Copies of all relevant drawings shall be included. 3. Operating section shall include description of equipment, operating procedures for start-up, steady state, shutdown, emergency and fault conditions, operating parameters, function of protective devices and controls, copies of all relevant cause and effect charts and block diagrams, and fault finding guidelines. 4. Maintenance section shall include instructions for maintenance disassembly, repair/overhaul and reassemble, schedule of preventative maintenance/maintenance frequencies. 	
MRB (R02)	<p>Manufacturing Record Book is an organized compilation of construction, manufacturing, installation, testing, reporting and certification documentation required to demonstrate that constructions, equipment materials and fabricated systems and units are in compliance with the statutory regulations and specified requirements.</p>	
DISPATCH DOSSIER (R05)	<p>Dispatch Dossier shall mean all those documents required, as a minimum to accompany goods released to site from Contractors/Suppliers and Fabricators. Procured goods shall not be dispatched without Dispatch Dossier. Also includes quantities of preservatives and fluids required for shipment.</p>	
TRAINING MANUAL (R06)	<p>Operator and Maintenance training manual shall be a separate document that contains detailed training information developed by the Supplier/Contractor from the documents prepared for the project (e.g.: drawings, manuals, spare parts, BOM's etc).</p>	

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4 RESPONSIBILITIES

Contractors/Suppliers – Are responsible to be completely aware of and follow the requirements herein. Supplier/Contractor shall have a designated Document Control contact person responsible for Aconex setup and coordinate contractual submissions to LCPDCC. Supplier/Contractor shall create and submit all required documentation as per the stipulations of this document.

LCP Document Control (LCPDCC) Team – Is responsible for clarifying the requirements where necessary as well as the receipt, standard Document Control quality checking and management of the documentation submitted to LCP by the Supplier/Contractor.

LCP Document Control (LCPDCC) Centre – is responsible to manage and process Supplier/Contractor document submittals in accordance with this document. Email LCPDCC@lowerchurchillproject.ca

LCP Responsible Lead/Package Engineer – is responsible for coordinating and identifying the distribution, review/approval cycles, and providing guidance for the management of technical documents including:

- Establish and Control of Review and Distribution Matrices
- Control the Inter Discipline Coordination (IDC) review of documents for assigned work package(s) on the project.
- Resolve the issues that may occur internally during the IDC review of Supplier/Contractor documents.
- Incorporate the comments and assign review status from the IDC review of Supplier/Contractor documents.
- Sign off the Supplier/Contractor documents.
- Submit the Supplier/Contractor documents to LCP Document Control Center (LCPDCC), who will issue them to the Supplier/Contractor.

LCP Contract Administrator - Responsible for managing the contract requirements and obligations with the Supplier/Contractor.

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5 REFERENCES

LCP-PT-MD-0000-IM-FR-0001-01	Document Front Sheet for Suppliers/Contractors
LCP-PT-MD-0000-IM-FR-0002-01	Drawing Templates for Suppliers/Contractors
LCP-PT-MD-0000-IM-FR-0003-01	SDR Template (A01)
LCP-PT-MD-0000-IM-FR-0004-01	Installation, Commissioning, Operations and Maintenance Table of Contents Template
LCP-PT-MD-0000-IM-FR-0005-01	Manual Binder Spine Templates for Final Documentation
LCP-PT-MD-0000-IM-FR-0006-01	Manufacturing Record Book Table of Contents Template
LCP-PT-MD-0000-IM-FR-0008-01	Dispatch Dossier Table of Contents Template
LCP-PT-MD-0000-IM-FR-0009-01	Manual Binder Cover Pages for Final Documentation
LCP-PT-MD-0000-IM-FR-0010-01	Major Equipment and Supply Chain Information
LCP-SN-CD-0000-EN-PR-0002-01	Engineering - Service Codes and Equipment Tagging
LCP-PT-MD-0000-IM-PR-0009-01	Procedure for Issuance of Revision Controlled Documents for Internal Review & Acceptance
LCP-PT-MD-0000-IM-SD-0001-01	Coding Standard

6.0 INTRODUCTION

The objective of this document is to define the requirements for Suppliers/Contractors to submit documentation and drawing to the LCP project team from creation to completion/turnover.

6.1 SUPPLIER/CONTRACTOR DOCUMENT REQUIREMENTS LIST (SDRL) AND DOCUMENT REGISTER (SDR)

All potential Suppliers/Contractors will be provided a project specific SDRL and associated templates as part of the initial Bid Package. This SDRL forms the basis of the contractually required document deliverables. The SDRL is necessary to produce the SDR also known as the A01 on the SDRL. Upon award, the SDR (A01) document should be completed by the Supplier/Contractor to include a complete list of required document deliverables as agreed in the SDRL. Each listed deliverable should have an associated forecasted submission date, etc. The SDR is to be submitted as defined on the SDRL.

Supplier/Contractor shall submit a completed SDR (A01) form (LCP-PT-MD-0000-IM-FR-0003-01) indicating the document deliverables to be supplied per the Purchase order/Agreement's specific SDRL.

The SDR (A01) shall always be the first document produced and delivered within two weeks after award of contact or purchase order. This document register is subject to review and acceptance by LCP and identified as SDRL code A01.

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Once the SDR (A01) has been agreed with the LCP Responsible Lead/Package Engineer, the Supplier/Contractor shall maintain the SDR (A01) until contract closeout and issue in Aconex on a monthly basis with any and all updates.

The SDR (A01) shall be completed as follows:

1. The Document/Drawing numbers shall be assigned in accordance with Section 6.2.
2. Document Title.
3. If at the time of the initial submission of the SDR (A01) specific titles cannot be identified, the Supplier/Contractor shall contact the LCP Responsible Lead/Package Engineer for clarification.
4. In conjunction with LCP document coding, the Supplier/Contractors may reference their own document number and revision sequence (where applicable).
5. Include the planned submission date per the SDRL requirements.

Once a document has been submitted per the SDR (A01), the document number shall not be re-used. If a document is superseded or made void, this shall be stated clearly in the SDR (A01). Same if the placeholder is cancelled, it shall be clearly stated on the SDR.

6.2 DOCUMENT/DRAWING CREATION

All Supplier/Contractor document/drawing numbers will be reserved by LCPDCC after approval of SDR (A01), in accordance with the Coding Standard, LCP-PT-MD-0000-IM-SD-0001-01 for the Lower Churchill Project. All reserved document/drawing numbers or place holders will be transmitted via Aconex.

Electronic documentation submitted by the Supplier/Contractor for review must be in the text searchable PDF format OCR (Adobe Standard Software).

Electronic documentation may also be required in native format for integration into design development. Specific requirements and exceptions will be outlined in the package specific Supplier/Contractor Documents Requirements List (SDRL).

All documents in letter (size 8-1/2 in x 11 in) and legal (size 8-1/2 in x14 in) shall include the Document approved LCP Front Sheet for Suppliers/Contractors - LCP-PT-MD-0000-IM-FR-0001-01 as the first page of each document.

Electronic files shall be limited to one file per document/drawing. Where there are multiple files, a unique and logical reference would need to be applied. Please note: a document with multiple pages submitted as a single document is reviewed as one document. Any revisions to a particular page or sheet of the document shall require the complete document to be resubmitted with the next revision. Partial submissions will not be accepted.

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All drawings shall be created and delivered on standard paper sheets. All drawings should also be defined with a border and no markings shall be permitted outside the border. Drawing notes shall be positioned in a column at the right hand side of the drawing.

Drafting standards shall be in compliance with the project symbol requirements.

The following tables describe the accepted drawing formats and scales to be used on the Lower Churchill Project.

Table 1 – Acceptable Drawing Sizes

STANDARD		DIMENSIONS		PROJECT REQUIREMENTS
ISO 216 (Metric)	A0		841 mm x 1189 mm	X
	A1		594 mm x 841 mm	X
	A2		420 mm x 594 mm	X
	A3		297 mm x 420 mm	X
	A4		210 mm x 297 mm	X
ANSI Y14.1 (Imperial)	E	34 in x 44 in		X
	D	22 in x 34 in		X
	C	17 in x 22 in		X
	B	11 in x 17 in		X
	A	8.5 in x 11 in		X

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Table 2 – Accepted Drawing Scales

Type of Drawing	Metric Scales
Topography	
General, Hydrology, Topography	1:20 000
	1:10 000
	1:5 000
	1:2 000
	1:1 000
Plans and Profiles	1: 500
	1:200
	1:100
Building Drawings	
Location Plan, Key Plan	1:10 000
	1:5 000
Site Plan, Layout Plan	1:2 000
	1:1 000
	1: 500
General Layout Drawing, Plot Plan	1:500
	1:200
	1:100
Layout Drawing (general or partial)	1:100
	1:50
Detail and Assembly Drawings	1:30
	1:20
	1:10
	1:5
	1:2
	1:1

6.2.1 REVISION STATUS

All documents and drawings require a revision status upon submission. The first submission will be submitted as revision status of A1 – Issued for Review, unless otherwise agreed to by the LCP Responsible Lead/Package Engineer. All A1 documents are to be resubmitted at revision B or higher **and** achieve a Review Code 01 to be considered ready for use.

All drawing revisions shall be shown by a “cloud” surrounding the area with revision symbol. The revision symbol shall be a triangle with revision letter/number inside. Note of the revision are to be made in the title block of the drawing. Clouds are not to cover portions of the drawing which has not been revised.

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Previous revision symbols and clouds are to be removed and only current revision shall be shown when a drawing is re-issued.

Revision Status are as follows:

- A – IDC – Issued for review
- B – Approved for Use/Implementation/Bid
- C – Approved for Purchase/Construction/Fabrication
- D – Approved for Design
- L – As-Built/Final
- N – Cancelled
- S – Superseded
- V – Void

If a drawing or document is to required to be voided, it must be VOIDED in its entirety and then issued at the next submission as a V status. VOID shall be written within parallel lines across the full drawing or the first page of a document and authorized by the LCP Responsible Lead/Package Engineer.

If a document or drawing is required to be superseded meaning the information on the existing document/drawing has been re-located to another document/drawing, the Contractor/Supplier is to make the appropriate cross-references on the superseded document and show a revision status of S to represent that the information has been superseded and issued S1.

All changes in revision statuses must be reflected on the SDR upon the next monthly submission.

6.2.2 TAG NUMBERS

The purposes of tagging and numbering are for the work protection code process, for asset management by identifying individual equipment in the different project facilities, and for the procurement of equipment and material, including bulk material. Reference Engineering - Service Codes and Equipment Tagging - LCP-SN-CD-0000-EN-PR-0002-01.

Tag numbers shall be used and clearly identified on all Supplier/Contractor documents to facilitate rapid and efficient identification of the equipment throughout LCP.

For equipment items with tag numbers, the tag number must be placed on the drawing and in proximity to the item so there is no confusion which tag belongs to which item.

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6.3 DOCUMENT AUTHORIZATION

The Supplier/Contractor shall be responsible to ensure that:

1. All necessary checking, authorization and acceptance of their documents is performed prior to submittal to LCPDCC;
2. All the Supplier/Contractor documents are submitted via the LCP Aconex System to LCPDCC and never sent directly to the LCP Responsible Lead/Package Engineer or LCP Contract Administrator; and
3. The Sub-Supplier/Sub-Contractor documents are to be complete and integrated in a logical manner with those being provided by the Supplier/Contractor and shall be accepted by supplier/contractor prior to submission to LCP team.
4. All documentation/drawings are of good quality.

6.4 SUBMISSION OF SUPPLIER/CONTRACTOR DRAWINGS AND DOCUMENTATION

Upon award of the contract/purchase order, the LCP Contracts Administrator/Buyer will request the contact name, email address and phone number of the Supplier/Contractor's Document Control representative. An email will be sent to the representative by LCPDCC advising of the required steps to creating an Aconex user account(s). This includes:

1. Setting up their organization with Aconex directly.
2. Providing accounts to your internal team members
3. Contacting the LCPDCC representative to add you and your company participants to the applicable LCP databases in Aconex and submit the required Aconex presentation, online tutorial, forms and any other relevant information.
4. Participating in project specific training with your Document Control representative. Example: Uploading Documents to Aconex.

All document/drawing numbers must be reserved prior to submission, which will be developed and approved from the Supplier/Contractors SDR (A01). The assigned document/drawing numbers shall be processed electronically via Aconex approved metadata placeholder and issued by LCPDCC to the Supplier/Contractor by Aconex transmittal. Any document or drawing received without an assigned number will not be processed.

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The dates shown for documents to be submitted on the SDR (A01) shall be the forecasted date of arrival at the LCPDCC via the electronic document management system (Aconex). The forecasted date shall be in accordance with the expected dates as defined in the SDRL.

If hardcopies of documents are required to be submitted in addition to the electronic submission via Aconex a copy of the transmittal to be submitted with the hardcopy and sent to LCPDCC team as follows:

Nalcor Energy
 Project Delivery Team
 Lower Churchill Project
 350 Torbay Road, Suite 2
 St. John's, Newfoundland
 A1A 4E1
 Attention: LCP Document Control

6.4.1 QUALITY OF DOCUMENTS UPON SUBMITTAL

Typically, all documents are issued electronically as searchable Optical Character Recognition (OCR) PDF documents. All pages of documents and drawings shall be of correct orientation, legible, with all required content, numbered correctly as requested through the SDR and assigned by Aconex. Both documents and drawings should include the correct revision, dates, signatures and stamps (if required). All pages of a document should be numbered correctly and consecutively with no blank pages. All documents/drawings shall be in the English language.

All dates referenced shall be in the format dd-mmm-yyyy (eg: 17-May-2013)

6.4.2 REVIEW OF DOCUMENT AND DATA

Review and comment by the LCP Responsible Lead/Package Engineer/LCP Contract Administrator or conversely, the failure to review, shall not imply acceptance or relieve the Supplier/Contractor of any responsibility or liability for dimensional or functional accuracy or completeness of such data, or the equipment being supplied.

The LCP Responsible Lead/Package Engineer/LCP Contract Administrator shall review in accordance with the Procedure for Issuance of Revision Controlled Documents for Internal Review & Acceptance - LCP-PT-MD-0000-IM-PR-0009-01 and returned to the Supplier/Contractor within the terms of the Purchase Order/Agreement.

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6.4.3 RETURN OF SUPPLIER/CONTRACTOR DOCUMENTS

The LCP Responsible Lead/Package Engineer shall assign to each of the Supplier/Contractor document submitted, one of the Review Codes as as listed below:

- Code 01 - Reviewed and Accepted – No Comments
- Code 02 - Reviewed – Incorporate Comments, Revise and Resubmit
- Code 03 - Reviewed – Not Accepted
- Code 04 - Information Only
- Code 05 - Not Reviewed

6.4.4 RESUBMISSION OF SUPPLIER/CONTRACTOR DOCUMENTS.

All documents submitted/resubmitted for review shall have achieved Review Status Code 1 or 5 or have been made void/cancelled at Purchase/Agreement closeout.

Once code 01 has been received, LCP Package Engineer will request a B1 or C1 to be issued by Supplier/Contractor. Resubmission of document assigned Return Code 02 and 03 is required before being considered suitable to proceed with the work. The Supplier/Contractor has 14 calendar days or unless otherwise specified in the contract from receipt of comments to resubmit the document

Any documents modified after acceptance at Code 01 or 05 must be resubmitted for review/acceptance.

On each subsequent submission of same documentation previously reviewed by LCP, the Supplier/Contractor shall use the applied same unique number but different revision as per LCP Coding Standard. If on the next submittal of a document where the previous submittal has not yet been returned then the Supplier/Contractor shall consult with LCP Responsible Lead/Package Engineer prior to issuing the revised document.

All drawing revisions shall be shown by a “cloud” surrounding the area with revision symbol. The revision symbol shall be a triangle with revision letter/number inside. Note of the revision are to be made in the title block of the drawing. Clouds are not to cover portions of the drawing which has not been revised. Previous revision symbols and clouds are to be removed and only current revision shall be shown when a drawing is re-issued.

6.4.5 RED-LINES

Red-Lines will be required as directed by the LCP Responsible Lead/Package Engineer. This may include all or none of the company supplied documents.

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6.4.6 AS-BUILT/FINAL DOCUMENTS

The SDRL template provides the LCP Responsible Lead/Package Engineer identification of the As-Built requirements. The Supplier/Contractor shall ensure that the final status of the documents reflects only those documents that need updating to reflect their accurate final status, need to be submitted:

- a) The "As-Built/Final" status shall be provided for materials/equipment/construction.
- b) Where subsequent modifications have been undertaken to materials/equipment/construction provided these are reflected in the final documents.
- c) Shall be issued at a revision status of "L"

At the completion of the Purchase/Contract, all documents shall reflect the "As-Built/Final" status of the service, and the Supplier/Contractor shall include the following paragraph in the Final Stage Payment Certificate:

"We the Supplier/Contractor certify that all documents supplied in association with the above Purchase/Contract fulfill our contractual requirements and reflects the "As-Built/Final" status."

"As built" drawings, shop drawings and material lists shall be forwarded no later than 14 calendar days or unless otherwise specified in the contract after the end of fabrication.

6.5 MANUALS

6.5.1 PRELIMINARY ISSUE

The templates provided are for guidance with the final content being agreed with the LCP Responsible Lead/Package Engineer.

Installation, Commissioning, Operations and Maintenance Manual (ICOM) Table of Content - LCP-PT-MD-0000-IM-FR-0004-01

Manufacturer’s Record Book (MRB) Table of Content - LCP-PT-MD-0000-IM-FR-0006-01

Dispatch Dossier Table of Content - LCP-PT-MD-0000-IM-FR-0008-01

Preliminary Submittal

After approval of the Table of Contents, the Supplier/Contractor must submit electronically and in one file, the first submittal of the complete manual in an OCR enabled PDF format for review.

Note: Adobe OCR Documents preserve the fidelity of the original files and are more reliable and easier to use because they retain the fonts, images, graphics, and layout of any source file regardless of the application and platform used to create them. Adobe OCR Documents can lock down content to create

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easily searchable, auditable documents of record. Bookmarking shall also be applied based on the Table of Content.

6.5.2 FORMAT FOR MANUALS

The Supplier/Contractor shall submit all manuals in English.

Material shall not be submitted in loose form but shall be completely fastened together and bound in a rigid binder. Binder size maximum of 4" D- size to be used ensuring ½" of space is available so not to restrict the turning of pages. Document to be printed double sided where possible to reduce the number of binders required.

Professional-quality presentation binder that has 3 secure locking rings and a clear view cover that folds back for easy insertion of the Manual Binder Cover Page for Final Documentation - LCP-PT-MD-0000-IM-FR-0009-01 and spine label holder for the Manual Binder Spine Templates for Final Documentation LCP-PT-MD-0000-IM-FR-0005-01. Binders must have 2 inside pockets for filing CD or DVD and a D-Ring mechanism, complete with triggers, for easy access.

The number of hardcopies per manual are as follows:

- R01 - ICOM - three (3) hard bound copies upon handover.
- R02 – MRB - electronic version and the supplier/contractor to keep original hardcopies for traceability and auditing purposes – three (3) hard bound copies upon handover.
- R05 – Dispatch Dossier – three (3) hard bound copies – one to be delivered to site with the equipment/goods and the other 2 to be sent to LCPDCC Document Control Centre.
- R06 – Training Manual – three (3) hard bound copies upon handover.

6.5.3 ELECTRONIC COPY

Electronic copy shall be submitted using Aconex transmittal process.

Special Note: Electronic and hard copy must be identical

The final submission of the manuals shall include;

- Two (2) copies of each DVD (Master and Backup)
- All drawings submitted with final manuals shall be As-Built and original drawing along with the .dwg electronic native format or other Company approved formats as applicable.
- Electronic versions of all manuals shall be provided in PDF File Format and in their original Native Electronic File Format. There shall be one PDF file for each manual and multiple PDF files for one Manual will not be accepted.
- PDF File formats shall be in one OCR file using Adobe Acrobat software

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- Native electronic files shall be submitted in Microsoft 2000 or higher electronic format (with each electronic file clearly identified according to its proper location in the manual based on the table of contents).

Upon confirmed approval by the LCP Responsible Lead/Package Engineer on the final version of Manuals, the Supplier/Contractor shall prepare the final version of Manuals in DVD Format, the procedure for which is described below. The Supplier/Contractor shall submit two (2) copies of each DVD, one marked "MASTER", and the other marked "BACKUP". Each DVD shall have a label with details including and not limited to "Project Document Number", "Project Title" & "Agreement/PO Number". Each DVD shall be of good quality and shall be virus checked before submission to the LCP Responsible Lead/Package Engineer for final acceptance.

The Manuals in DVD format shall be created in a format known as "Portable Document Format" (PDF) using Adobe Acrobat Writer 8.0 or latest software for Windows XP. The DVD shall be self-executing and the software for the operation of the DVD is Adobe Acrobat Reader for Windows XP which shall be delivered as part of the DVD Operating System. Adobe Acrobat Reader allows the PDF files to be viewed, printed and navigated.

DVD format requirements shall be:

- Electronic documents shall be converted from the native file to PDF image files using Adobe Acrobat Writer 8.0 or higher.
- Non-electronic documents shall be scanned to minimum 300 dpi (Dots per Inch) and converted from the original format to PDF using Adobe Acrobat Writer 8.0 or higher.
- Create the folders to match the table of contents
- Create bookmarks to identify chapters and sections and thumbnail for pictures and images.

6.5.4 TRAINING MANUAL (R06)

Operator and Maintenance training manual shall be a separate document that contains detailed training information, developed by the Supplier/Contractor from the documents prepared for the project (eg: drawings, manuals, spare parts, BOM's etc).

- Manual Front Page and Spines
- Document Front Sheet for Suppliers/Contractors
- Title of the Project- Lower Churchill Project
- Project Contract Number and description of Work
- Manual Nalcor Document Number and Revision
- Name and Address of Main Supplier/Contractor and Sub-Supplier/Contractor
- Volume No. of Manual

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6.5.5 FINAL SUBMISSION OF MANUALS

The Supplier/Contractor shall submit to the Lower Churchill Project a complete electronic PDF version as well as hard copy(s) of the complete set of manuals to the following address:

Nalcor Energy
 Project Delivery Team
 Lower Churchill Project
 350 Torbay Road, Suite 2
 St. John's, Newfoundland
 A1A 4E1
 Attention: LCP Document Control Centre

One electronic PDF version must be uploaded and submitted via transmittal using the Lower Churchill Project Aconex System.

Prior to final issue of the ICOM it is recommended that the LCP Responsible Lead/Package Engineer meet the Supplier/Contractor to review the manual to prevent repetitive issues and the requirements described below have been met. All other manuals are to be submitted for acceptance via Aconex for approval prior to submitting final version.

6.6 COMPONENT SPECIFIC REQUIREMENTS

6.6.1 HYDRO – GENERATION – COMPONENT 1 - 3D MODEL CATIA

As part of the scope of the Lower Churchill Project the Hydro Generation Component 1 will be developing a 3D Model. CATIA by Dassault System is the software used to develop this model.

To meet this requirement, equipment Supplier/Contractor are required to provide a 3D representation of the facilities and equipment that are being provided in CAT.PART format or STEP or IGES compatible with CATIA.

3D models provided in formats other than the above require validation and approval from the company prior to submission.

Electronic Copy drawings shall be provided in DWG (AutoCAD), CAD Drawing and PDF format.

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6.6.2 TRANSMISSION LINES, TOWERS AND FOUNDATIONS – COMPONENT 4 - 3D MODEL PLS

Transmission lines

The transmission line designs are completed with the use of the PLS-CADD software (PLS Systems Inc.)

All sag/tension reports, stringing charts and plan and profile sheets are produced with PLS-CADD. All vector loads for each loading cases and line angle are produced with the PLS-CADD/LITE software

Towers

The tower designs are completed with the PLS-TOWER software. The supply of tower shall include the updated PLS-TOWER models, compatible with the PLS-CADD software. The PLS-TOWER backup file shall be supplied. Each tower type will be supplied with the full set of PLS-TOWER models. For each tower type, a PLS-TOWER model shall be supplied for each of the tower height, at each 1.5m increment, from minimum tower height to maximum tower height.

Foundations

The steel grillage foundation designs are completed with the SAP2000 software. The supply of the grillage foundation type shall be supplied with the updates SAP2000 models, including the tower foundation loads as defined by the PLS-TOWER software.

7.0 PROJECT SPECIFIC INSTRUCTIONS

To ensure efficient handling of drawings and other documents, Supplier/Contractor shall abide by the following rules:

- All drawings to be produced using the LCP Drawing Templates for Suppliers/Contractors - LCP-PT-MD-0000-IM-FR-0002-01. It is acceptable for the Supplier/Contractor to place its complete drawing within the LCP drawing frame.
- A document with multiple pages submitted as a single document will be reviewed as one document. Any revisions to a particular page or sheet of the document shall require the complete document to be resubmitted with the next revision assigned.
- When a Section is shown on a separate drawing sheet, the Plan drawing number shall be included in the Section identification.

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- Reference drawings shall be tabulated in the “Reference Drawing” section at the bottom of the drawing. Equipment/nozzle tabulation on General Arrangements (GA) shall be on the right side of the drawing.
- Drawings produced must be submitted as a complete drawing file. This means all drawing files must be bound to include all relevant information. This is necessary to properly access/view and use the drawing.
- Documents identified as requiring the Engineer’s Seal and Signature will be in accordance with the Newfoundland and Labrador Professional Engineers and Geoscientists Act. Refer to www.pegnl.ca.
- Supplier/Contractors shall ensure that all documents involved in the provision of architectural services, when issued, shall bear the signature and seal of the architect who prepared or approved them as per The Architects Act of the province of Newfoundland and Labrador.

8.0 RECORDS

N/A

9.0 ATTACHMENTS

N/A



Lower Churchill Project

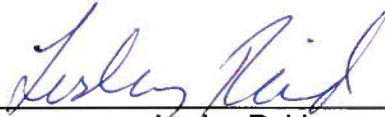
WASTE MANAGEMENT PLAN

Component 1 and 4b

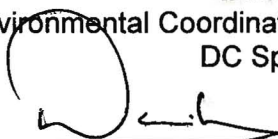
SLI Document No. 505573-0000-68RA-I-0008-02

Nalcor Reference No. LCP-SN-CD-0000-EV-PL-0005-01-B3


Date: 30-Sep-2012

Prepared by: 


Lesley Reid
Environmental Coordinator Transmission Lines and
DC Specialties


Check by: 


David Haley
Environmental Manager

Approved by: 

Normand Bechard
Project Manager

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Revision					
N°	By	Check	Appr.	Date	Remarks
02	LR	DH 	NB	30-Sep-2012	Issued to be aligned with other management documents
01	MW	KD	NB	09-Apr-2012	Issued for Client review and acceptance
00	MW	KD	NB	08-Mar-2012	Issued for Client approval
PC	MW	KD	NB	19-Jan-2012	Issued for Review
PB	MS	KD	NB	28-Oct-2011	Issued for Review

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	Component 1 and 4B				
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MAINTENANCE OF THE WASTE MANAGEMENT PLAN (WMP)

This *WMP* will at times require updating in response to changes in the Project, Contractor work methods, group structure, or technological advancements that provide a higher level of environmental protection. The subsections below indicate the process with respect to maintenance and implementation of the *WMP*.

Initiating Revisions

This *WMP* is a controlled document and revisions may only be processed by SNC Lavalin's (SLI's) Environmental Manager. It is anticipated that most of the revisions to this *WMP* will be initiated by the environmental management team at the site or at the Lower Churchill Project office in St. John's.


Nalcor staff shall request revisions through document control. *WMP* holders and readers/reviewers (within SLI, government agencies, contracting firms, other stakeholders, etc) may request revisions by forwarding a completed Revision Request Form (RRF), provided in Section 12, to SLI's Environmental Manager. These revision requests will be screened and reviewed by SLI in conjunction with Nalcor staff, and forwarded to SLI's Project Manager for approval.

Compliance Instructions

Revision requests that have been accepted by SLI's Project Manager will be sent to SLI's Environmental Manager for distribution to key Project participants as "Compliance Instructions" These instructions shall be signed off by key holders of the *WMP* and returned within two days of receipt. A log of compliance instructions shall be maintained by SLI's Environmental Coordinator (Hydro), and these will be incorporated periodically into a revised edition of the *WMP*

Revision Procedures

Revisions to the Waste Management Plan shall be made annually, or as required, in accordance with SLI's document control procedures. SLI's Environmental Manager

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will issue the accepted revisions of the Waste Management Plan to key holders, Contractors, and readers/reviewers. Each revision will be accompanied by a Revision Control Record (provided in Section 12) that:

- a) identifies all compliance instructions that have been issued since the last revision; and
- b) Lists the sections being superseded.

Within two working days of receiving a revised Plan, *WMP* holders shall:

- a) Familiarise themselves with revised sections of the *WMP*;
- b) Incorporate all revisions into their areas of responsibility, as appropriate;
- c) Ensure that all personnel are familiar with the revisions; and
- d) Acknowledge receipt of the revised *WMP* by forwarding via fax, email, or mail a signed and dated acknowledgement form to SLI's Environmental Manager. The receipt of revision acknowledgement form is located in Section 12.




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1 INTRODUCTION

This *Waste Management Plan (WMP)* is developed to establish safe, efficient and environmentally compliant waste management during construction and commissioning activities of the Lower Churchill Project (LCP). This plan outlines the roles and responsibilities that all Project participants must follow to ensure that the collection, storage, transportation and disposal of all wastes generated during construction and commissioning activities of the LCP is managed in an environmentally sound manner.

1.1 PURPOSE

Specifically the purposes of this *WMP* are to:

- a) comply with the conditions and requirements of Environmental Assessment (EA) release;
- b) outline the Lower Churchill Project's commitments to minimize potential environmental effects - including commitments made in the Environmental Impact Statement (Nalcor, 2009) and during the regulatory review process under the joint review panel;
- c) manage potentially adverse impacts on the environment and protect the health and safety of site personnel (including Contractors, Subcontractors/vendors and visitors);
- d) provide a reference to applicable legislative requirements and guidelines;
- e) provide a reference document for Lower Churchill Project participants to use when planning and/or conducting specific procurement, construction and commissioning activities with respect to waste management;
- f) provide a detailed summary of waste management issues and measures to be implemented during construction and commissioning;

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g) provide direction for environmental orientation programs for Lower Churchill Project participants; and

h) communicate changes to the *WMP* through an interactive revision process;

The intent is to afford a high degree of control over the handling of waste and to implement the ideals of the three R's namely reduction, recovery/reuse and recycling of wastes. Ultimately this plan will help to minimize potential adverse environmental effects and provide a framework for those involved in the Project.


This document will be reviewed on an annual basis (or as deemed necessary by SLI or Nalcor) throughout the construction phase and updated as necessary to accommodate the dynamics of design and construction as it progresses.

1.2 SCOPE AND APPLICATION

The scope of this *WMP* covers the engineering, procurement, construction, and commissioning phase of the Lower Churchill Project for Components 1 and 4b. The focus of this plan is on construction and commissioning activities for the site access roads, reservoir preparation, accommodations and administrations complex, laydown areas, AC line from Muskrat Fall to Churchill Falls, and the Muskrat Falls hydroelectric generating facility. Section 2 describes the Project in more detail. Note that the cable crossing at the Strait of Belle Isle and the Labrador Island Transmission Link are not within the scope of this *WMP*.

This *WMP* is one component of the Lower Churchill Project's *Environmental Management Plan (SLI Document # 505573-0000-68RA-I-0004, NE-LCP Document # MFA-SN-CD-0000-EV-PL-0001)*. Other subordinate documents of the Environmental Management Plan include the following:

a) *Contract-Specific Environmental Protection Plan (C-SEPP) Template (SLI Document # 505573-0000-68RA-I-0011, NE-LCP Document # LCP-SN-CD-0000-EV-PL-0006-01)*

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- b) *Rehabilitation Plan (RP) (SLI Document # 505573-0000-68RA-I-0007, NE-LCP Document # LCP-SN-CD-0000-EV-PL-0004-01);*
- c) *Regulatory Compliance Plan (RCP) (SLI Document # 505573-0000-68RA-I-0003, NE-LCP Document # LCP-SN-CD-0000-RT-PL-0001-01); and*
- d) *Project-Wide Environmental Protection Plan - Component 1 and 4b (SLI Document # 505573-0000-68RA-I-0005, NE-LCP Document # LCP-SN-CD-0000-EV-PL-0002-01);*

Nalcor's Emergency Response Plan is a companion document to the Environmental Management Plan. It contains a Master Spill Response Plan, which shall be used by contractors as a basis for preparing their own spill response plans.

This *WMP* applies to all Project participants, including Nalcor, SLI, Contractors, Subcontractors, suppliers, service providers, and all employees of these organizations.


Given the Lower Churchill Project's magnitude, accepted *Contract-Specific Environmental Protection Plans (C-SEPPs)* shall be required. C-SEPPs shall be prepared by all contractors for all construction contracts to ensure that effects on the environment are minimized to the extent practical. These C-SEPPs shall provide sufficient detail on the Contractor's:

- a) Scope of work;
- b) Methods of construction;
- c) Sequence of activities;
- d) List of resources (i.e. equipment and site workforce);
- e) Temporary and permanent installations;
- f) Environmental protection procedures and alternative procedures, if required; and
- g) Environmental contingency measures.

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One aspect of the C-SEPP will be how the Contractor proposes to handle the waste from their activities.

This *WMP* will serve as a resource to Contractors as they prepare their own *C-SEPPs*. Contract packages shall include the C-SEPP template, with specific instructions on how these templates are to be properly completed. All C-SEPPs shall require approval by both SLI and NE-LCP prior to the contractor's mobilization to site.


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2 PROJECT DESCRIPTION

2.1 MUSKRAT FALLS HYDROELECTRIC DEVELOPMENT AND AC TRANSMISSION LINE (COMPONENT 1 AND 4B)

Muskrat Falls is one of two hydroelectric developments being planned for the lower Churchill River. The remotely controlled nominal 824 MW Muskrat Falls Hydroelectric Development will be composed of the following sub-components and associated ac connector lines to an ac switchyard:

- a) 16 km of permanent access roads, including upgrading of existing roads and new construction;
- b) Reservoir, approximately 60 km long and 101.4 km² in total area;
- c) Replacement fish habitat;
- d) A north roller compacted concrete (RCC) overflow dam;
- e) Gated spillway including:
 - i) Approach and discharge channels; and
 - ii) Vertical lift gates.
- f) A close coupled intake and powerhouse including:
 - i) intakes with gates and trash racks;
 - ii) concrete lined water passages;
 - iii) turbine/generator units at approximately 206 MW each with associated ancillary electrical/mechanical control equipment;
 - iv) power transformers (includes 1 spare), located on the draft tube deck of the powerhouse; and
 - v) 2 overhead cranes;
- g) A south dam;

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- h) Component diversion works (i.e. cofferdam and spillway for diversion channel);
- i) Stabilized north spur;
- j) ac switchyard at Muskrat Falls; and
- k) Churchill Falls switchyard extension.


Figure 2-1 shows the current concept for the generating facility.



Figure 2-1: Muskrat Falls Generating Facility (Component 1)

2.2 SUB-COMPONENT 4B: HVAC OVERHEAD TRANSMISSION LINE MUSKRAT FALLS TO CHURCHILL FALLS


- a) Transmission lines from Muskrat Falls to Churchill Falls:
 - i) 2-315 kV ac, 3 phase lines, double bundle conductor;
 - ii) Single circuit galvanized lattice steel guyed suspension and rigid angle towers; and
 - iii) 250 km long.

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2.3 CONSTRUCTION RELATED INFRASTRUCTURE

Construction related infrastructure will be established to support construction activity for components 1 and 4b. Some of this infrastructure is temporary and shall be decommissioned before the end of the construction phase. It is anticipated that the following infrastructure will be required:

- a) A 1,500 person accommodations and administration complex (for construction period);
- b) Access roads associated with the main dam structure, the accommodations complex and reservoir;
- c) Diversion facilities (i.e. upstream and downstream coffer dams, the latter of which is to be removed prior to tailrace flooding);
- d) Borrow pits and quarries;
- e) Construction bridge;
- f) Concrete and crushing plants;
- g) Construction power and site communications infrastructure;
- h) Reservoir clearing camps and wood storage yards;
- i) Material storage and laydown areas including the potential use of port facilities (if upgrades are required to port facilities they shall be completed by the responsible party);
- j) Fuelling and fuel storage facilities;
- k) Spoil areas;
- l) Muskrat Falls 25 kV construction power line & construction power terminal substation;
- m) HVac transmission line construction camps; and
- n) Trash and debris collection boom, associated roads and debris storage areas.

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3 RELEVANT LEGISLATION

There are federal, provincial and municipal regulatory requirements that apply to the waste management needs of the Project. The Project will fully comply with all applicable regulatory requirements. Copies of all permits and licenses shall be obtained and kept on file and a copy provided to SLI by all Contractors, Subcontractors and facilities for all aspects of their work related to waste disposal. Compliance will be facilitated through a program of environmental compliance monitoring, primarily implemented by the On-Site Environmental Monitors.

3.1 FEDERAL


The following federal acts apply to waste management at the Project:

- a) *Transportation of Dangerous Goods Act (TDGA);*
- b) *Canadian Environmental Protection Act (CEPA); and*
- c) *Hazardous Materials Information Review Act.*

3.2 PROVINCIAL

The following provincial acts and regulations apply to waste management at the Project:

- a) *Waste Management Regulations;*
- b) *Waste Diversion Regulations*
- c) *Dangerous Goods Transportation Act;*
- d) *Storage and Handling of Gasoline and Associated Products Regulations;*
- e) *Used Oil Control Regulations;*
- f) *Environmental Control Water and Sewage Regulations;*
- g) *Newfoundland and Labrador Environmental Protection Act (NLEPA); and*


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h) *Water Resources Act.*

3.3 MUNICIPAL

Should any construction activities take place within any municipal boundaries, local bylaws will need to be complied with and permits obtained.

Note: The above legislation listed in Sections 3.1, 3.2 and 3.3 is not considered exhaustive. The waste generator is responsible to ensure all relevant legislation is followed prior to waste generation and disposal on the LCP.

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4 STAGED APPROACH TO WASTE MANAGEMENT

The following subsections describe waste management responsibilities before and after the start of the Garbage Removal and Disposal Contractor's (GRDC's) mandate, and Figure 4-1 shows the anticipated workforce during the approximate 6 year construction period.

4.1 PRE-GRDC IMPLEMENTATION


The Early Works contracts are the first to be awarded for the Project. The purpose of these contracts is to develop access and infrastructure to facilitate construction of the Muskrat Falls hydroelectric generating facility. These Early Works construction contracts are as follows:

- Main Site Access Road South Side (including clearing);
- Accommodations Complex Site Utilities
- Accommodations Complex Buildings;
- Administrative Buildings; and
- Construction Power.

During initial stages of Accommodations Complex development, a starter camp will be constructed. This camp will house the Bulk Excavation Contractor's workforce until the Accommodations Complex is fully developed.

After this starter camp is completed, the GRDC will begin its work, and provide service primarily to those housed at this camp.

It is anticipated that the total workforce on site will start at 125 to a maximum 490 people during the Early Works construction period.


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4.2 POST-GRDC IMPLEMENTATION

Post-GRDC work includes all construction contracts that begin after the start of all Early Works contracts. During this time it is expected the site workforce will increase substantially from about 630 people initially and reaching 1,500 workers in the 4th year of construction.

As described above, the GRDC will remove and dispose of domestic wastes and sewage from holding tanks in facilities provided by SLI (e.g. wash-cars, trailers), sewage sludge from septic tanks for the starter camp, and sludge from the Accommodations Complex sewage treatment plant. All wastes generated in facilities established by Contractors (e.g. portable toilets, lunchroom/office trailers, etc) shall be the responsibility of the Contractor.

Excluded from the GRDC's mandate are construction & demolition wastes, all wastes generated by Contractors working in remote locations (e.g. Reservoir Clearing, ac Transmission Line), hazardous wastes other than sewage and sewage sludge as mentioned above and biomedical wastes.

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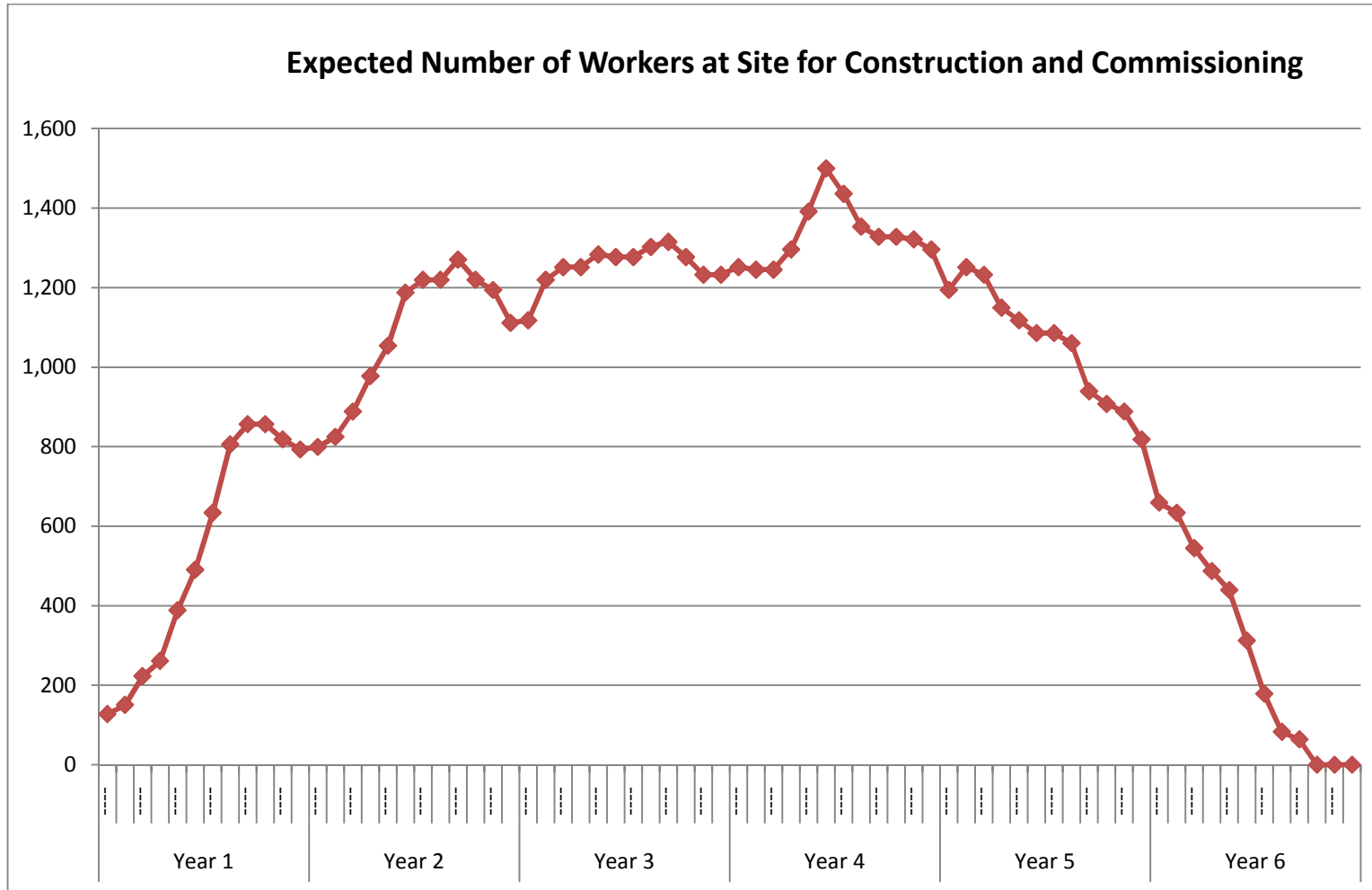




Figure 4-1: Expected Workforce from Year 1 to Year 6

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5 ROLES AND RESPONSIBILITIES

The Lower Churchill Project environmental management team is comprised of NE-LCP and SLI environmental, engineering, and construction management staff. A Responsibility Matrix is provided in Figure 5-1. Figure 5-2 illustrates the team structure. Roles and responsibilities of team members are further defined in the sections that follow.

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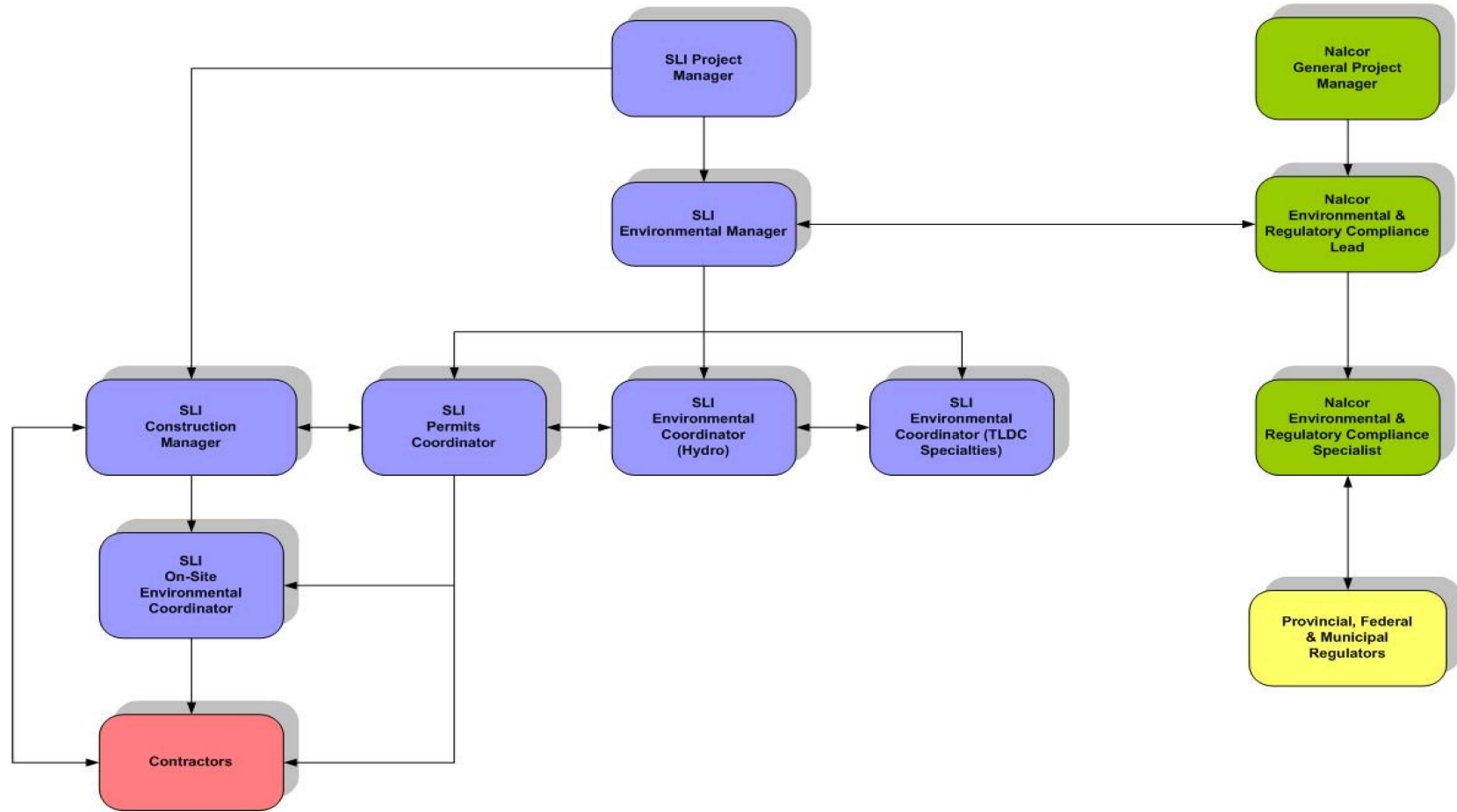




Figure 5-1: Lower Churchill Project Hydroelectric Generation Facility Project: Environmental Management Team

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Activity	SNC Lavalin Inc	Project Manager	Environmental Manager	Environmental Co-ordinator (Hydro)	Permits Co-ordinator (T/D/C Specialties)	Component Co-ordinator	Construction Manager	Interface Manager	Area Manager	On-Site Environmental Monitor	SLI Staff	Nalcor Energy	Garbage Removal and Disposal Contractor	Medical Services Contractor	Roads Contractor	Other Contractors
Administration Activities																
Development of the WMP	A	R	S	S	S	S	S	I	I	I	S	I	I	I	I	I
Review of WMP	A	R	S	S	S	S	S	I	I	I	I	A/R	I	I	I	I
Approval of WMP (SLI/Nalcor)	A	R	I	I	I	I	I	I	I	I	I	R	I	I	I	I
Implementation of the WMP	A	R	R	R	R	R	R	I	I	S	I	C	R	R	R	R
Management/Revisions of the WMP	A	R	R	S	S	I	C	I	I	S	S	C	I	I	I	I
Contractor Orientation	A	C	I	I	I	I	R	I	I	S	I	I	R	R	R	R
WMP Compliance Monitoring (Contractors and Site Services)	A	R	R	S	S	I	C	I	I	R	I	C	C	C	C	C
Corrective Actions	A	R	C	C	C	I	R	I	I	S	I	I	R	R	R	R
Managing Compliance Tracking Registry	A	R	R	R	R	I	C	I	I	I	S	C	I	I	I	I
Waste Management Activities																
Early Works																
Sewage Disposal	A	R	S	S	C	I	R	I	I	R	I	I	I	I	R	R
Domestic Waste Disposal	A	R	S	S	C	I	R	I	I	R	I	I	I	I	R	R
Construction Waste Disposal	A	R	S	S	C	I	R	I	I	R	I	I	I	I	R	R
Hazardous Waste Disposal	A	R	S	S	C	I	R	I	I	R	I	I	I	I	R	R
Biomedical Waste Disposal	A	R	S	S	C	I	R	I	I	R	I	I	I	R	S	S
Work after first 6 months																
Sewage Disposal	A	R	S	S	C	I	R	I	I	R	I	I	R	I	R	R/S
Domestic Waste Disposal	A	R	S	S	C	I	R	I	I	R	I	I	R	I	R	R/S
Construction Waste Disposal	A	R	S	S	C	I	R	I	I	R	I	I	I	I	R	R
Hazardous Waste Disposal*	A	R	S	S	C	I	R	I	I	R	I	I	I	I	R	R
Biomedical Waste Disposal	A	R	S	S	C	I	R	I	I	R	I	I	I	R	S	S

Accountable, Responsible, Supports, Consulted, Informed

Figure 5-2: Responsibility Matrix

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5.1 NALCOR

5.1.1 Individual Responsibilities

Nalcor's *Project Manager* shall be accountable for the review and acceptance of the *WMP*. As part of this process Nalcor shall be responsible for making sure that the plan as prepared is consistent with its environmental policy, and commitments made during the Environmental Assessment process to various aboriginal groups and stakeholders are honoured.

Nalcor's *Project Manager* shall be consulted on the various aspects of *WMP* management and will provide information to SLI's Environmental Management Team as required to manage and update the *WMP* and process applications for selected permits, as identified by Nalcor.

Nalcor's *Environmental and Regulatory Compliance Lead* and Nalcor's *Environmental and Regulatory Compliance Specialist* will support the *Project Manager* in his/her responsibilities. Communication and liaison with local municipalities and federal/provincial regulators will be the responsibility of the *Environmental and Regulatory Compliance Specialist*.


5.1.2 Nalcor Auditing Function

Nalcor will periodically perform audits on SLI's performance as it relates to the *WMP* to ensure compliance with commitments in the EIS and regulatory requirements.

5.2 SLI

Waste management support will fall under the guidance of the SLI Environmental Management Team (as shown in Figure 5-1). SLI shall provide onsite direction and monitoring of all waste management activities throughout the life of the Project. In addition, once the Garbage Removal and Disposal Contractor are engaged, SLI will:

- Provide a Hazardous Waste Storage Area for Contractor use; however construction and maintenance of storage facilities (i.e. used oil tanks) and final

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disposal and removal of equipment will be the responsibility of the Contractor and he/she will abide by applicable regulations;

- Provide common collection locations for domestic waste and removal and disposal of this waste periodically through the GRDC¹;
- Provide services for the removal of sewage sludge through the GRDC¹;
- SLI/GRDC will not provide domestic waste collection services or sewage sludge removal services for Contractors operating during this phase in remote locations, nor for the road construction Contractor, reservoir clearing Contractor, ac Transmission Line Contractor, or for any construction camps used by them.

Administration type responsibilities are defined further in the following section of individual responsibilities.


5.2.1 Individual Responsibilities

SLI Project Manager

This individual shall be:

- Accountable for developing, implementing, managing and approving the *WMP*;
- Accountable for approving *WMP* revision requests;
- Accountable for all SLI staff actions including waste management compliance monitoring, tracking and potential corrective actions;
- Informed of Nalcor's review and acceptance of the *WMP*;
- Accountable for Contractor waste management actions and enforcing compliance related to the *WMP*; and
- Accountable for ensuring the Contractor receives the applicable site orientation related to waste management.

¹ Note the GRDC will remove and dispose of these wastes collected from only the hydroelectric generating facility site, Nalcor and Contractor laydown areas, and accommodations complex site.

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SLI Environmental Manager


This individual shall be:

- responsible for all processes involved in developing, implementing and managing the *WMP*;
- Responsible for managing all *WMP* revision requests, including receiving such requests, coordinating the screening of these by appropriate members of SLI's and Nalcor's environmental management teams, and preparing/distributing waste management "Compliance Instructions" to key Project participants;
- Responsible for all SLI staff actions including waste management compliance monitoring and tracking, and enforcing corrective actions;
- Informed of Nalcor's review and acceptance of the *WMP*;
- Responsible for oversight of the Contractor's waste management activities such as storage and disposal;
- Responsible for distributing accepted *WMP* revisions to key Project participants, and receiving acknowledgement of receipt; and
- Responsible for ensuring that an annual performance review of the *WMP* is conducted.

SLI Environmental Coordinators (Hydro and Transmission)

This individuals shall be:

- Responsible for managing and implementing the *WMP* and waste management environmental compliance monitoring;
- Informed of Nalcor's review and acceptance of the *WMP* and the Contractor's orientation;
- Supportive to SLI's Environmental Manager in overseeing the Contractor's waste management activities;

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- Responsible for maintaining a log of waste management “Compliance Instructions”;
- Responsible to ensure all waste streams generated by the Contractors are identified in the Waste Management Plan; and
- Responsible for undertaking quarterly compliance audits for applicable components.

SLI Permits Coordinator:


This individual shall be:

- Responsible for managing the Permit Registry in conjunction with the *SLI Environmental Coordinator (Hydro)* and the *SLI Environmental Coordinator (Transmission)*;
- Supportive to SLI’s *Environmental Coordinators* with implementing and managing the *WMP* as well as waste management compliance monitoring;
- Informed of Nalcor’s review and acceptance of the *WMP* and the Contractor’s orientation;
- Consulted by the Contractors regarding disposal practices and requirements of permits; and
- Responsible for maintaining copies of permits/licenses, and track and communicate permit requirements for waste management.

SLI Component Managers:

These individuals shall be:

- Responsible for ensuring the *WMP* is included in procurement packages;
- Supportive for the development of the *WMP*;
- Consulted during waste management compliance monitoring; and
- Informed about all other aspects of the *WMP*.

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SLI Construction Managers:

These individuals shall be:

- Responsible for overseeing construction including management of on-site waste management activities through implementation of the *WMP*;
- Responsible for reporting directly to SLI's *Project Manager* in St. John's;
- Consulted on all aspects of management of the *WMP*, waste management compliance monitoring, and compliance tracking;
- Responsible for ensuring Contractors receive the appropriate orientation and training required related to waste management; and
- Responsible for overseeing waste management activities by the Contractors at the Project Site, and reporting any non-compliance and enforce corrective actions.

SLI Area Managers:


These individuals shall be:

- Informed on all aspects of the *WMP*;

SLI On-Site Environmental Monitors:

These individuals shall be:

- Responsible for monitoring on-site Project activities;
- Responsible for evaluating the Contractors' environmental performance with respect to requirements established in the *WMP*;
- Responsible for tracking on-site compliance with regulatory requirements and conditions of all permits and approvals as they relate to waste management.
- Responsible for reporting directly to the OSEC, Construction Manager and SLI's Environmental Coordinators;
- Responsible for interacting with the Contractors on waste management matters;

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- Responsible for preparing and submitting daily reports to SLI's Construction Managers, Environmental Manager, and Environmental Coordinators;
- Supportive to SLI's Construction Managers with ensuring Contractors receive the appropriate waste management orientation before working on site; and
- Responsible for ensuring that the Contractor's waste streams are all properly characterized.

SLI On-Site Environmental Coordinators:

These individuals shall be:


- Responsible for coordinating all activities and monitoring effort by the On-Site Environmental Monitors to ensure the WMP is complied with.
- Responsible for evaluating the Contractors' environmental performance with respect to requirements established in the *WMP*;
- Responsible for reporting directly to the Construction Manager and liaising with SLI's Environmental Coordinators;
- Responsible for interacting with the Contractors on waste management matters; and
- Supportive to SLI's Construction Managers with ensuring Contractors receive the appropriate waste management orientation before working on site.

5.2.2 SLI Auditing Function

The purpose of SLI's auditing function will be to evaluate the performance of the *WMP* and to identify opportunities for continual improvement.

SLI auditing will consist of daily field reports, quarterly environmental compliance audit reports, initiating corrective action and annual performance reviews.

Daily reports will be completed by the On-Site Environmental Monitor. These reports will focus on the Contractors' environmental performance, including a summary of their waste management activities.

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A quarterly environmental compliance audit reports will be completed by SLI Environmental Coordinators for the Transmission and Hydro components. These reports will review all aspects of the Contractor's performance and will have a section focusing on incidents of non-compliance with the *WMP*. SLI's Environmental Coordinators shall distribute the Environmental Compliance Audit Reports to relevant Project participants.

An annual performance review will be completed by key members of the Environmental and Construction teams. This audit will review all aspects of the Contractor's performance, including activities that relate to waste management and disposal. The review process will give all parties a chance to evaluate overall environmental performance and compliance with government regulations, permits and all Plans, including the *WMP*.


5.3 CONTRACTORS

In all cases, Contractors must communicate clearly to SLI the types and volumes of waste they produce. In addition, they must regularly monitor their waste management activities to ensure that all required approvals are always in place and that facilities are appropriately licensed to accept their wastes.

5.3.1 Pre-GRDC Implementation

Contractors shall be responsible for the management of waste in their working areas in accordance with this *WMP*. Responsibilities include the safe collection and containment of all hazardous and non-hazardous waste. Contractors will also be responsible for the offsite transportation and final disposal of waste to a facility or site licensed to accept it. All waste will be the responsibility of the Contractor.

Biomedical waste will be the responsibility of the Medical Services Contractor. Contractors will support the Medical Services Contractor through approved temporary disposal of biomedical items.

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5.3.2 Post-GRDC Implementation

The GRDC shall be responsible for collection of domestic waste and sewage removal at the camp facility post contract award. Contractors shall support the GRDC in the task of domestic waste disposal by management of domestic waste in their specific working areas in accordance with this *WMP*, including the transportation of waste to the provided containers or designated storage areas.

In certain cases in remote areas or areas that are difficult to access, Contractors (including the Roads Contractor, Reservoir Preparation Contractor and ac Transmission Line construction) will be responsible for managing their own domestic waste and sewage removal. Contractors will be responsible for the offsite transportation and final disposal of the domestic waste and also for engaging a licensed Sewage Removal Contractor.

All Contractors are responsible for their own construction and demolition material and all hazardous waste generated as a result of their activities. This material shall be transported to a facility or site licensed to accept it. A temporary storage area will be identified by SLI for temporary placement of hazardous materials, until such time that it can be transported to the appropriate facility or disposed of by a Hazardous Materials Sub-contractor (as engaged by the Contractor). This storage area is only a location to be provided by SLI, and the construction, maintenance and eventual removal of all hazardous material is the responsibility of the Contractor.

Biomedical waste will be the responsibility of the Medical Services Contractor. Contractors will support the Medical Services Contractor through approved temporary disposal of biomedical items.

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6 MANAGEMENT PLAN

This *WMP* has been prepared, with considerations for current waste management practices in the province, for Component 1 and 4B of the Lower Churchill Project. That being said, waste management within the Province is changing, under the direction of the Provincial Waste Management Strategy. It can be expected that waste management requirements for the Project may need to be revised and revisited in the future as more local and regional modern waste management facilities and programs are established. Currently the Happy-Valley Goose Bay region contains a municipal landfill that accepts domestic waste along with a privately owned soil treatment facility licensed to accept hydrocarbon impacted soil. There is no licensed hazardous waste facility in the region. In addition, initiatives and programs for waste segregation are limited in the region at this time. As a result of the limited facilities and waste programs in the region, it is anticipated that most hazardous wastes will require transportation and disposal outside of the region or Province. In the event local waste initiatives and new waste facilities are established, the *WMP* will be revised to reflect these changes. Revisions to this plan shall be made as identified in the Preface.

This *WMP* addresses all wastes expected to be generated onsite during Component 1 and 4B work, classifies waste into streams and outlines the handling and disposal options for each type of waste. A summary of potential waste treatment and disposal options is included in Table 6-1.

All construction activities and their associated waste streams (outlined in the subsections below) are subject to appropriate regulations. Section 3 of this document provides a list of relevant legislation that applies to waste management on the LCP.

Contractors shall provide the Engineer with two (2) copies of all permit documentation and licenses immediately on receipt from regulatory agencies. Any subcontracted facility accepting any type of waste and recyclable materials shall provide documentation to the Contractor, and copies of this documentation shall be kept on file for inspection by the Engineer.


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6.1 WASTE CLASSIFICATION

Contractors on site are responsible for the handling, sorting and in some cases storage and disposal of the waste they generate at the site (See Section 5, Roles and Responsibilities for Contractors responsibilities at different stages of the Project).

There are a number of strategies that Contractors can use to handle wastes expected at the site. These strategies are as follows:

- **Waste segregation:** All site Contractors, Subcontractors and the GRDC will be required to implement category-wise segregation of waste streams (i.e. liquid wastes, solid wastes, recyclable, hazardous, etc.) in accordance with local disposal requirements. All waste categories will be analyzed and the principals of the following three R's will be applied:
- **Reduction initiatives:** Reducing the raw material consumption is the first step to reduce waste generation. To practice this principle all processes and material used will be evaluated on the basis of possible reduction in raw material usage.
- **Recovery/reuse initiatives:** Recovery of usable material or energy as a by-product is an important part of the waste minimization process. All opportunities for onsite reuse of waste materials will be highly encouraged.
- **Recycling initiatives:** Recycling is the next option considered for the successful management of the waste streams. Wherever possible, recycling of used oil, beverage containers, tires, copper and aluminum, etc. and reuse of the material in other applications will be encouraged. A site orientation on recycling will be provided by SLI's Representative to all Contractors, Subcontractors and employees regarding recycling responsibilities.
- **Disposal:** Disposal becomes the final option when other options are not technically or economically feasible. All waste shall be disposed of according to relevant guidelines and regulations, as detailed in the following sections.


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Hazardous vs. Non-Hazardous Wastes

The types of solid wastes considered include inert or non-hazardous wastes of various kinds (i.e. containers, filters, belts, scrap metals, domestic garbage, etc.) or hazardous wastes (i.e. used oils, solvents, paints, used/unused chemicals, old batteries, chemical based sludge etc.).

Both hazardous and non-hazardous wastes will be generated at the site. A general description of such wastes is illustrated in Figures 6-1 and Figure 6-2. A description of the prescribed handling and disposal methods of the anticipated materials generated at the site is provided in the following sections.

A Hazardous Waste Storage Area (HWSA) will be provided by the Project; however the Contractors will be responsible for construction and maintenance of any storage facilities (i.e. used oil tanks) that they place at the site. Contractors shall arrange for transportation to a licensed hazardous waste facility for possible recovery, treatment and disposal as required. All storage, handling and disposal activities will follow applicable regulations.

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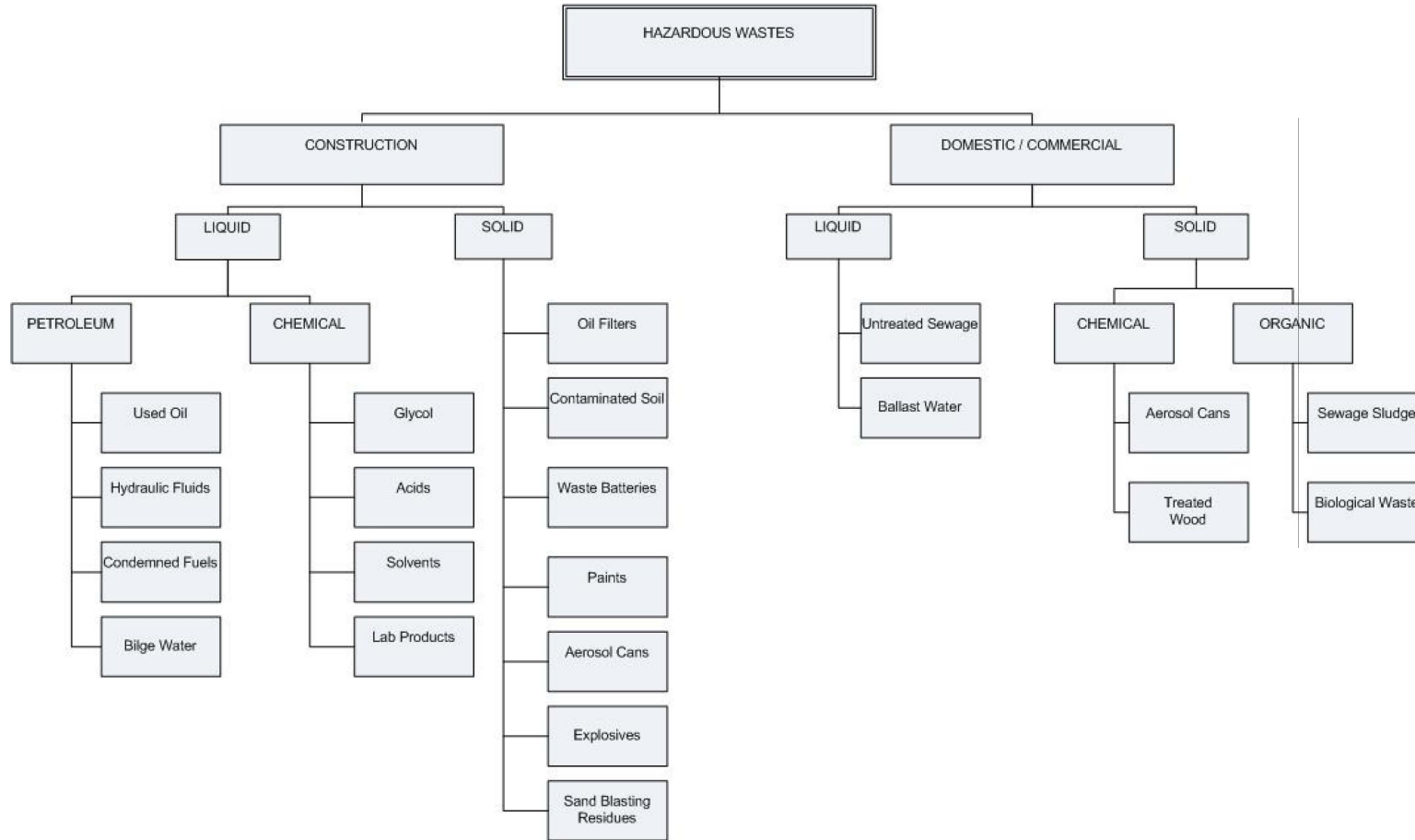



Figure 6-1: Potential Hazardous Waste Generate

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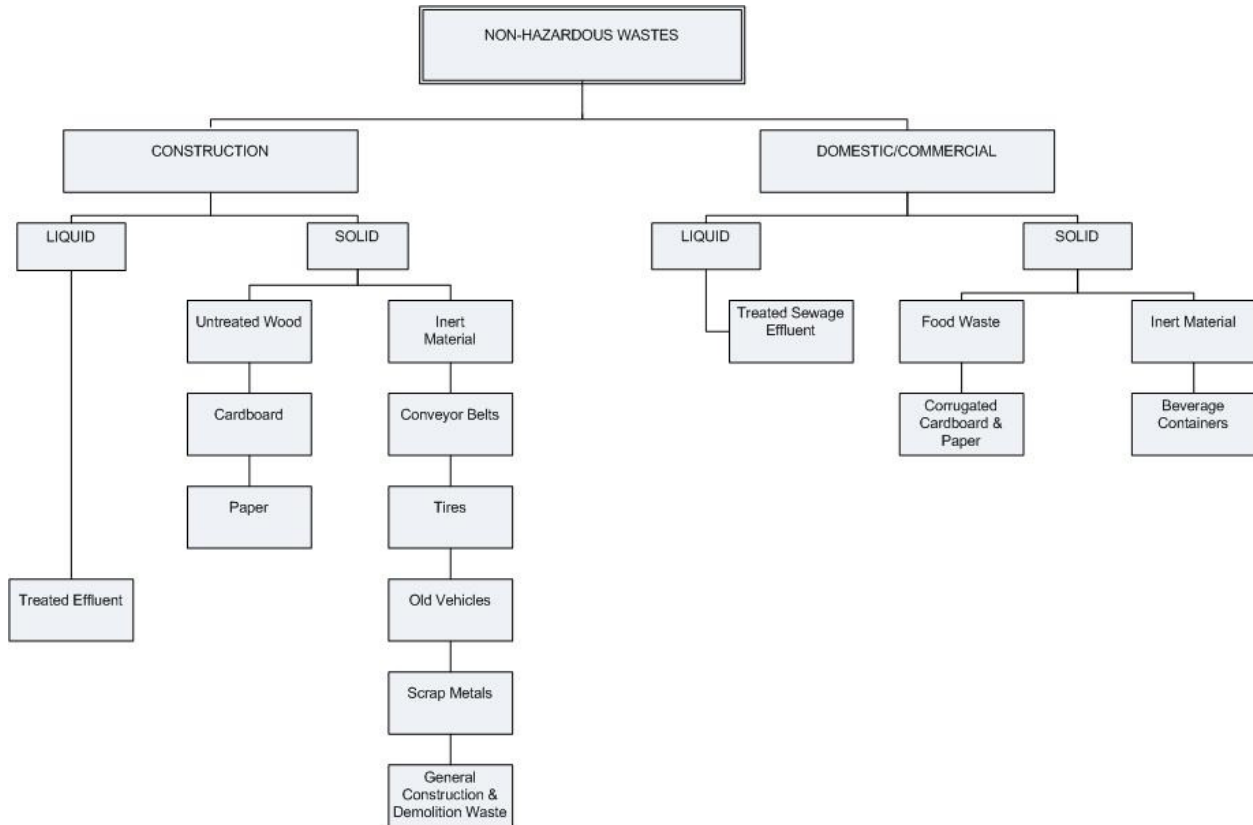



Figure 6-2: Potential Non-Hazardous Wastes Generated

6.2 HAZARDOUS WASTES

It is expected that hazardous wastes will be generated during construction activities. Hazardous wastes include such materials as used batteries, paint, cleaning fluids and petroleum based wastes.

Special precautions shall be exercised when handling these materials since the improper release or disposal could adversely affect the environment. Personnel handling wastes will be required to have specific training and utilize PPE to ensure safe handling and disposal.

A HWSA will be provided by the Project, however the Contractor will be responsible for construction and maintenance of any storage facilities (i.e. used oil tanks).

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Contractors shall arrange for transportation to a licensed hazardous waste facility for possible recovery, treatment and disposal as required.

All chemical and hazardous wastes generated in remote areas will be managed under all applicable guidelines and regulatory requirements and brought to a licensed hazardous waste facility on a regular basis. Processing of the various anticipated chemical wastes are described below. Approved containers for hazardous wastes stored on site and transported to licensed disposal/recycling facilities shall meet requirements of the *Transportation of Dangerous Goods Regulations* (see <http://www.tc.gc.ca/eng/tdg/moc-menu-202.htm>).

Note: Contractors are responsible for disposal of their Hazardous waste including preparation, suitable shipping containers and transportation of the hazardous waste to an offsite licensed disposal facility. Regular checks will be made by the On-Site Environmental Monitors.


6.2.1 Hazardous Construction Wastes

6.2.1.1 Hazardous Construction Liquid Petroleum Wastes

Petroleum-based wastes generated at the site will primarily be used engine and hydraulic oil. In addition there may be rear end/differential gear lubricants, oil from site electricity generators, used degreasing solvents, contaminated or expired diesel. These wastes shall be segregated as necessary in order to render the individual waste streams easier to reuse for other purposes, recycle or permit recovery of by-products.

Used Oil and Hydraulic Fluids

The Contractor is encouraged to initiate acceptable recycling options for used oil, either onsite or offsite, wherever practical. For example, used oil could be reused or combined (with new oil) where low-grade fuels may be used such as kerosene heaters, waste oil burners for shops and warehouses (with DOEC approval) or it could be sent offsite for recycling.

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The Contractor shall deposit used oil in a secondary containment tank located at the HWSA. The Contractor is responsible for installing and maintaining these tanks. The waste oil shall be regularly collected by a qualified and experienced Hazardous Waste Contractor. The Hazardous Waste Contractor shall be engaged by the Contractor.

The tanks will have double-containment and roof-vent connection for oil removal as defined in the *Used Oil Regulations*. All connecting pipes will be above ground, making it easier to inspect for leaks. The tank fill ports will normally be locked and the keys made accessible to designated employees only as per the *Provincial Used Oil Control Regulations*.

Note: Waste oil may be contaminated with small amounts of diesel fuel, heating fuel and water, while still retaining its recycling properties. Contamination with gasoline, glycol, solvents, or solids will render waste oil unfit for recycling into usable engine oil at any offsite facility and create a large increase in disposal unit costs.

Regular monitoring will be carried out as per “Design, Construction, Operation, Maintenance and Inspection of Terminal and Tank Facilities Guidelines”, API-2610 and any additional provincial registration requirements and *Provincial Used Oil Control Regulations* under the *Environmental Protection Act*. The Contractor shall provide the Engineer with two (2) copies of all permit documentation immediately on receipt from regulatory agencies. This includes the permit from the disposal facility permitted to accept the used oil.

The Contractor is required to maintain an active inventory of all petroleum products on site. This will ensure that reasonable balance is maintained between the amount of oil used/recovered versus amounts unused and in inventory.

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Condemned Fuels

Diesel fuel is sometimes condemned when the water content is too high. These fuels can be stored in drums at the HWSA by the Contractor and transported offsite to be used by others as low-grade fuels through a waste exchange program or sent to a licensed offsite facility for destruction.

Bilge Water

The word is typically used to describe the water that collects in the bilge compartment of a marine vessel. Water that does not drain off the side of the deck drains down through the ship into the bilge. This water may be from rough seas, rain, minor leaks in the hull, other interior spillage, etc. The water that collects in the bilge must be pumped out to prevent the bilge from becoming too full and threatening to sink the ship.

Bilge water can be found aboard almost every vessel. Depending on the ship's design and function, bilge water may contain water, oil, urine, detergents, solvents, chemicals, pitch, particles, and so forth.


By housing water in a compartment, the bilge keeps these liquids below decks, making it safer for the crew to operate the vessel and for people to move around in strong weather.

Under no circumstances shall bilge water be discharged into the ocean. This water shall be collected by an approved waste management firm, and treated and/or disposed of at an approved hazardous waste facility.

6.2.1.2 Hazardous Construction Liquid Chemical Wastes

Solvents

During construction, solvents will be used as a degreasing agent in the maintenance shops, Generator enclosures and utility services buildings. These degreasing solvents are toxic petroleum based chemicals; however, non-toxic citrus-based alternatives shall be encouraged as substitutes where only moderate degreasing or

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cleaning is required. Detergents and steam jets shall be used where feasible to minimize the use of solvents. Solvents shall not be allowed to drain onto the ground; they shall be collected in drip pans for reuse or disposal.

Residual or used solvents shall be stored in leak-proof containers. The containers will be shipped offsite to a licensed recycling/disposal facility. Industrial part washers/solvent recyclers are available and Contractors are encouraged to use them to reduce the amount of waste solvent generated.

Lab Products

During construction, materials testing may be established on site. These sites will predominantly perform physical tests; chemical waste generation will be minimal. The personnel working in these facilities will be trained to identify and segregate the hazardous components from their waste streams. The chemical wastes shall be stored in containers (as outlined in Material Safety Data Sheets (MSDSs) required by Workplace Hazardous Materials Information System regulations and other relevant legislation, as shown in Table 6-1) and shall be collected by a qualified and experienced Hazardous Waste Contractor.


6.2.1.3 Hazardous Construction Solid Wastes

Used Filters

Used oil filters will be generated with ongoing heavy equipment maintenance. Used filters drained of oil will be stored in separate lined drums established at the HWSA by the Contractor for pickup by a qualified and experienced Hazardous Waste Contractor. A final record of disposal from the licensed hazardous waste facility should be provided by the Contractor to the Engineer.

Contaminated Soil

Effective implementation of this *WMP* should lead to a reduction of soil contamination via on-going inspection and scheduled maintenance of equipment, use of trays for draining, lining of loading and unloading zones and using secondary

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containment, for example secondary containment of hazardous materials storage tank areas. In spite of these measures, spills, leaks and ruptures may occur and hydrocarbon contamination of soil is a possibility. All spills and leaks shall be reported to the On-Site Environmental Monitors and immediate corrective action shall be taken. Refer to the Master Spill Response Plan and the P-WEPP for contingency and response plans in the case of a petroleum spill. Contaminated soil shall be transported to a licensed Soil Treatment Facility.


Note: Contaminated soil should be substantially reduced through education programs, equipment maintenance, operational techniques and manual “pick and shovel” excavation of land based spills wherever possible. The On-Site Environmental Monitors will be provided with a progressive and final record of disposal from the offsite licensed soil treatment facility.

Waste Batteries

It is expected that the bulk of used batteries generated will be primarily the lead acid type.

Used batteries shall be stored at the designated HWSA. The Contractor shall be responsible for storage/disposal/recycling of used lead/acid batteries, including draining and provision of shipping pallets, and transportation of the waste batteries to an off-site licensed disposal or recycling facility. The following procedures should be used for lead acid type batteries, such as those used by vehicles and industrial equipment:

- protect battery terminals with electrical tape to prevent short circuits;
- wrap battery with cloth, tape, and place in a polyethylene (garbage) bag;
- place in sturdy cardboard box, again packed with tape;
- place packaged batteries on a pallet, ensure all batteries are covered, and wrapped in shipping wrap or strapped. Do not ship batteries in a drum.
- Batteries must be shipped in accordance with the TDG Regulations.

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Paints

Waste paint will be recycled or reused if possible. Water-based paint will replace oil-based paint, alkyd, or epoxy wherever technically and economically feasible. Waste paint will be stored in drums at the designated HWSA and shipped to a licensed recycle/disposal facility. Paint cans that do not contain residual paint can be placed with general waste for disposal at a landfill approved to accept such waste. Paint and paint cans generated by Contractors, will be their sole responsibility, along with handling, shipping and disposal as applicable.

Aerosol Cans


The use of aerosol cans on site will be discouraged, however; where unavoidable, aerosol cans with residual product shall be collected separately in marked containers at the various work areas. Contractors, employees and other site personnel will be advised to separate these cans from the general waste stream. The cans shall be transported off site by a certified Hazardous Waste Contractor. Aerosol cans that do not contain residual product can be placed with general waste for disposal at a landfill approved to accept such waste.

It is recommended that the Contractor follow the waste minimization policy, as aerosols should be substituted wherever possible with refillable type pump/spray bottles.

Explosives

The Contractor will deal solely and expediently with any contaminated or expired explosive material in accordance with all licensing and regulatory requirements, standards and best practices. If any explosives are to be destroyed or shipped off-site, the Contractor will acquire approval from the On-site Environmental Monitors prior to taking action.

Explosives packaging may be burned at a site designated to do so. The Contractor shall get approval from the On-Site Environmental Monitor prior to taking action.

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Sandblasting Residues

During construction, sandblasting operations will be carried out in order to prepare some metal surfaces for coatings. During sandblasting activities, the surrounding areas shall be shrouded for dust control and all residual materials resulting from the sandblasting shall be collected by Contractor and temporarily stored in drums for analytical testing consistent with DOE's Pollution Prevention Division's guidance document entitled *Leachable Toxic Waste, Testing and Disposal*. The sandblasting residues, if determined through analysis as hazardous, shall be shipped offsite in accordance with all regulatory requirements, including those of the *Transportation of Dangerous Goods Regulations*, for final disposal at a facility licensed to accept hazardous materials. As previously discussed, hazardous material shall be temporarily stored in the Project provided storage location (HWSA). If the sandblasting residue is deemed non-hazardous, it will be transferred to a landfill approved to accept such waste.


6.2.2 Hazardous Domestic/Commercial Wastes

6.2.2.1 Hazardous Domestic/Commercial Liquid Wastes

Untreated Sewage

Toilet and wash facilities will be located throughout the site. For early works packages, port-a-potties or holding tanks will likely be used. Subsequent to the Early Works program septic systems with tile fields will be utilized for the starter camp, a full water and sewer/sewage treatment plant will thereafter be used for Accommodations Complex, sewage holding tanks and portable toilets will be used at remote locations. See Section 5, Roles and Responsibilities for information on sewage waste throughout the life of the Project.

In the case of toilet facilities not connected to any form of treatment, human waste shall be collected using a licensed septic removal service and sent to a licensed disposal facility. This will be required in cases where the responsibility does not rest with the GRDC (e.g. construction camps and work sites used by the Reservoir

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Clearing and ac Transmission Line Contractors, or any of the Early Works Contractors). The Contractor shall provide the Engineer with two (2) copies of all permit documentation and licenses for this service immediately on receipt from regulatory agencies. These services are available within the Town of Happy Valley-Goose Bay.

Ballast Water

The Ballast Water Control and Management Regulations, under the Canada Shipping Act, identifies the procedures to be used for release of Ballast Waters in Canadian Waters. Provisions of these regulations shall be strictly followed by all vessels involved in transporting goods, equipment, and materials involved on the Project.


6.2.2.2 Hazardous Domestic/Commercial Solid Wastes

Organic - Biomedical Waste

Small amounts of biomedical wastes will most likely be generated during construction. For the purpose of this Waste Management Plan, biomedical wastes regarded as hazardous include:

- All waste sharps (e.g. waste needles), wherever they are generated;
- All waste material generated in on-site medical clinics and mobile treatment centres that have become contaminated with bodily fluids;
- All wastes deposited in receptacles that are labelled “Biomedical Wastes Only” and which are strategically located within Company provided facilities; and
- All similar wastes collected and stored by Contractors in their own facilities.

Note that all soft waste materials contaminated with “significant amounts” of bodily fluids shall be immediately double bagged in plastic. These shall be placed in a “Biomedical Waste Only” receptacle provided by the Company or Contractor. All other materials and surfaces that have come in contact with such fluids shall be immediately cleaned with a disinfectant, such as bleach.

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Persons using needles to administer their own medication (e.g., diabetics) shall place their used needles in the approved sharps containers provided throughout the site.

Sharps generated in remote locations shall be collected and stored in approved sharps containers.

Biomedical wastes collected from filled sharps containers and “Biomedical Waste Only” receptacles shall be removed from the work site and transported to a licensed facility for destruction and disposal.

Disposal of biomedical waste collected at Company supplied facilities is the responsibility of the Medical Services Contractor. There is an existing bio-medical waste collection service that collects waste from Happy Valley - Goose Bay. The Medical Services Contractor shall organize a pickup/drop off schedule with for this service.

Off-site removal and disposal of biomedical wastes collected by Contractors and stored at their facilities shall be the Contractor’s responsibility.

Organic - Sewage Sludge

Sewage sludge generated by sewage treatment systems shall be removed from site by the GRDC and disposed of at a licensed waste disposal site.

Chemical - Treated Wood


During construction, pieces of unusable lumber treated with wood preservation chemicals shall be collected and disposed of in a licensed waste disposal site.

Chemical - Aerosol Cans

Aerosol cans shall be collected and disposed of in a licensed waste disposal site.

6.3 NON-HAZARDOUS WASTES

The handling, storage and disposal of waste materials that are classed as Non-Hazardous and generated at the site is generally the sole responsibility of the

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Contractor and shall be managed under all applicable guidelines and regulatory requirements.

An exception to this would be food wastes generated at the permanent Accommodations Complex. These wastes will be collected, hauled, and disposed of by the GRDC in accordance with a services contract.

6.3.1 Non-Hazardous Construction Wastes

6.3.1.1 Non-Hazardous Construction Liquid Wastes

Treated Effluent


Treated effluent (including effluent discharging into a water body from settling ponds, sewage treatment plants, and concrete batch plants) shall be released to the environment in accordance with SLI's approval.

Prerequisites for this approval are that all applicable regulatory permits and approvals be provided to SLI, and that the effluent quality is shown to meet all regulatory requirements (e.g. *Environmental Control (Water and Sewer) Regulations* and Section 36(3) of the *Fisheries Act*), and permit conditions.

All concrete trucks and associated equipment shall be cleaned in a manner that conveys all wash water to an approved settling pond to ensure its treatment prior to release to the environment. Washing of this equipment should preferentially take place at the concrete batch plant; however, minor washing of concrete truck chutes and hand tools may take place at the delivery location, provided that all wash water is contained and directed to an approved settling pond for treatment.

6.3.1.2 Non-Hazardous Construction Solid Wastes

The discussion below focuses on solid non-hazardous waste destined to approved waste disposal sites. Written copies of the site operators' permission shall be provided to the Engineer prior to disposal.

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Inert Material

SLI is committed to reducing the volume of the overall waste to the greatest extent practicable by reusing and recycling. Inert waste, such as waste concrete from the cleaning of cement trucks and pumps, off-spec and/or surplus production shall be reused rather than dumped whenever practicable.

If required, disposal of small amounts of waste concrete shall be done at a designated disposal site, which shall be accepted by the On-Site Environmental Monitors. The concrete shall be discharged into one or more "cow patties" not more than 6 feet in diameter and allowed to cure completely before being incorporated into the site fill.

Where possible, off spec or waste concrete shall be utilized to manufacture items such as barriers, retaining structures, etc; disposal shall be considered a last resort. If disposal is required, construction and demolition (C&D) waste shall be taken to a landfill approved to accept such waste.


Conveyor Belts and Tires

Conveyor belts and tires have limited life and, when no longer usable, contribute to construction waste generation.

Contractors must pursue a tire and conveyor belt exchange program with the vendors; and an investigation of alternative uses for old conveyor belts and tires shall be ongoing. Some suitable alternate uses for tires are dock protection and road protection in turning areas. However, for the most part, used conveyor belts and those tires not included under the MMSB tire recycling program (i.e. heavy equipment and industrial tires, etc.) shall be removed from the site and transported to a licensed waste disposal area. Tires included under the MMSB program, shall be taken to a MMSB authorized collection point by the Contractor for disposal.

Old Vehicles

Vehicles and equipment shall be shipped offsite for reuse/recycle when they are no longer useable. While awaiting back shipping, each Contractor shall store unusable

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vehicles and/or their metallic parts in areas designated by the Engineer. These shall be collected and hauled to a licensed metals recycling facility for processing.

All fluids shall be drained/collected and stored in a manner acceptable to SLI (in Project provided storage location previously mentioned) where they shall be collected and/or transported to a licensed Hazardous Waste Facility.


Scrap Metals

This waste stream consists of ferrous and nonferrous scrap metals of various types. Metal scraps may be generated from cut-off parts of reinforced steel bar, wire, ends of piping and other similar items. Scraps shall be deposited in a metals storage bin and collected by a licensed metals recycler.

Bulky scrap metals such as unusable vehicles or large appliances shall be shipped offsite for salvaging and disposal. Reusable scrap metals such as sheeting and used drums will be reused as a part of an effective waste reduction program. Recoverable/recyclable scrap metals shall be sent to the recycling facilities directly by the Contractor. Scrap metals that cannot be recycled will be sent to a landfill approved to accept such waste.

General Construction and Demolition Waste

Waste generated during construction activities may include salvageable materials such as electrical cables and reels, cladding, piping and insulation, where possible, these shall be removed from site for potential reuse. Alternatively, any useable excess materials, which might be required for maintenance and/or repairs, will be stored neatly in a warehouse or designated laydown area. Innovative use of excess materials, such as using electrical reels for stacking supports or portable bollards, will be encouraged where practical. Materials that cannot be recycled or reused will be transported directly to a landfill approved to accept such waste.

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Untreated Wood

During the construction phase, pieces of broken untreated lumber shall be collected and disposed of in a landfill authorized to accept such waste. .

Larger pieces of untreated lumber shall be stored at an SLI approved temporary storage area for potential reuse. Site personnel shall be informed to reuse this lumber material as much as possible or wherever feasible. When no longer usable at the site, untreated wood waste shall be shipped offsite for reuse.

Cardboard and Paper

Cardboard and paper wastes shall be recycled collected and sent to a local recycling facility, if available, or disposed of at an approved waste disposal site.

6.3.2 Non-Hazardous Domestic/Commercial Wastes

6.3.2.1 Non-Hazardous Domestic/Commercial Liquid Wastes

Effluent from a sewage treatment system that meets all regulatory requirements and permit conditions for discharge to the environment shall be released in accordance with the Engineers approval.


6.3.2.2 Non-Hazardous Domestic/Commercial Solid Wastes

Inert Material

The solid domestic waste stream consists of food waste, recyclable containers (cans, bottles), inert non-combustible domestic waste, packaging, corrugated cardboard, plastics, and paper and paper products.

The disposal of solid domestic waste is the sole responsibility of the Contractor for all Early Works contracts. For all other contracts, a GRDC is expected to be in place and this waste disposal Contractor shall assume responsibility for this waste stream.

All solid wastes generated in remote locations (including the Roads Contractor) will be managed by individual Contractors and transported to a licensed waste disposal site on a regular basis.

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Food Waste

The majority of the food wastes will be generated in the lunchroom areas of the construction site and accommodations complex. All food waste shall be collected and disposed of in an enclosed and covered wildlife-proof bin to minimize the attraction of wildlife.

Bag lunch wastes generated in various work areas shall be collected in plastic bags and taken directly to wildlife-proof bins. This will then be placed in a storage bin and taken to a landfill for disposal or compost. Appendix A includes a supplier's brochure of bear resistant containers that are acceptable for use as wildlife-proof bins.

Where possible, purchasing bulk food packages shall be encouraged at the site to minimize waste production, through the reduction of packaging materials.

Beverage Containers


Although plastic waste will be included in the garbage stream, bulk purchases and, where possible, reusable containers should be utilized to reduce the overall generation of plastic waste.

Where reuse of beverage containers at the site is not possible, and where practical, arrangements shall be made to transport those beverage containers to a local recycling depot.

Corrugated Cardboard and Paper

Fibre waste will be included in the garbage stream; however, where possible, paper reduction strategies should be exercised to reduce the overall generation of fibre waste. Examples of reduction strategies may include workplace initiatives promoting double-sided printing, employee training, procurement policies with respect to packaging, etc.

All cardboard and paper shall stored in a bin and be shipped off site to a licensed recycling facility, when required.

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Reduction in cardboard waste will be achieved by encouraging Contractors and suppliers to avoid extensive packaging.

6.4 OTHER WASTES

6.4.1 International Waste

Due to the possibility of shipment of supplies by water at the Happy Valley - Goose Bay and Cartwright Ports, international waste may be off-loaded from an international source, upon inspection and approval of the Canadian Border Services Agency (CBSA). The On-Site Environmental Monitors will be responsible to contact CBSA prior to off loading, however under a contractual arrangement, responsibility will rest with the Contractor and all associated documentation and records will be made available to the On-Site Environmental Monitors upon request.




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Table 6-1: Treatment and Disposal Plan


Waste Type	Site Handling/Shipping Methodology	Treatment or Disposal Strategy	Applicable Regulations/Permits/Information	Primary Responsibility
Petroleum Waste Stream				
Used Oil including used Hydraulic Fluids	Collect in trays and drums. Transfer to ULC storage tanks. Ship offsite.	Ship Offsite to a Licensed Facility for recycling or destruction	<i>Used Oil Control Regulations, EPA</i> <i>GAP Regulations, EPA</i> <i>TDG Regulations</i> <i>Reference Material for the WHMIS Requirements of the Hazardous Products Act and Controlled Products Regulations</i> <i>Fire Prevention Flammable and Combustible Liquids Regulations under the Fire Prevention Act, 1991</i>	Contractor
Condemned Fuels	Collect and store in drums at the Hazardous Waste Storage Area (HWSA). Ship offsite.	Ship Offsite to a Licensed Facility for recycling or destruction	<i>GAP Regulations, EPA</i> <i>TDG Regulations</i> <i>Reference Material for the WHMIS Requirements of the Hazardous Products Act and Controlled Products Regulations</i> <i>Fire Prevention Flammable and Combustible Liquids Regulations under the Fire Prevention Act, 1991</i>	
Used Oil Filters	Store canisters in separate drums at the HWSA. Ship offsite.	Recovery/Landfill at Licensed Offsite Facility	<i>Used Oil Control Regulations, EPA</i> <i>TDG Regulations</i> <i>Reference Material for the WHMIS Requirements of the Hazardous Products Act and Controlled Products Regulations</i>	
Contaminated Soils	Analyse Samples. Consult Regulations. Ship offsite.	Ship to Licensed Offsite Facility for Destruction or Bioremediation	<i>NL Guidance Document for the Management of Impacted Sites</i>	

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Waste Type	Site Handling/Shipping Methodology	Treatment or Disposal Strategy	Applicable Regulations/Permits/Information	Primary Responsibility
Chemicals				
Acids	Store in approved containers at the designated HWSA. Ship to offsite disposal facility.	Reduce / Dispose offsite.	<i>TDG Regulations</i> <i>Reference Material for the WHMIS Requirements of the Hazardous Products Act and Controlled Products Regulations</i>	Contractor
Solvents	Use non-toxic solvents when feasible. Store in approved containers at the designated HWSA. Ship to disposal facility offsite.	Reduce / Dispose offsite.	<i>TDG Regulations</i> <i>Reference Material for the WHMIS Requirements of the Hazardous Products Act and Controlled Products Regulations</i> <i>Fire Prevention Flammable and Combustible Liquids Regulations under the Fire Prevention Act</i>	
Waste Batteries	Store at the designated HWSA. Ship offsite by a qualified and experienced Hazardous Waste Contractor as per TDG requirements.	Ship to Licensed Offsite Facility for recycling or disposal.	<i>TDG Regulations</i> <i>Reference Material for the WHMIS Requirements of the Hazardous Products Act and Controlled Products Regulations</i>	Contractor
Aerosol Cans	Collect cans separately in marked drums. Store at the HWSA. Ship offsite by a qualified and experienced Hazardous Waste Contractor.	Reduce / Ship contents to Licensed Offsite Facility Offsite for disposal.	<i>TDG Regulations</i> <i>Reference Material for the WHMIS Requirements of the Hazardous Products Act and Controlled Products Regulations</i>	
Solvents, Paints, epoxies and adhesives.	Collect cans with residual product in drums. Store at the designated HWSA. Ship offsite. Empty containers can be collected	Dispose offsite at an offsite Licensed facility.	<i>Fire Prevention Flammable and Combustible Liquids Regulations under the Fire Prevention Act, 1991</i>	

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Waste Type	Site Handling/Shipping Methodology	Treatment or Disposal Strategy	Applicable Regulations/Permits/Information	Primary Responsibility
	and shipped with regular waste for disposal in Regional Landfill.			
Laboratory Products	Store at source. Dispose offsite.	Dispose offsite at an offsite Licensed facility.	<i>TDG Regulations Reference Material for the WHMIS Requirements of the Hazardous Products Act and Controlled Products Regulations</i>	
Explosives (expired or contaminated)	In accordance with all regulatory standards, protocols, good practices.	Reduce, destroy, ship off-site	<i>TDG Regulations</i>	Contractor
Other Wastes				
Fluorescent bulbs/tubes	Store at the designated HWSA. Ship offsite by a qualified and experienced Hazardous Waste Contractor.	Recovery/Landfill at Licensed Offsite Facility	<i>TDG Regulations Reference Material for the WHMIS Requirements of the Hazardous Products Act and Controlled Products Regulations</i>	Contractor
Tyvek Suits/Rags	Store at the designated HWSA. Ship offsite by a qualified and experienced Hazardous Waste Contractor.	Recovery/Landfill at Licensed Offsite Facility		
Printer and Toner Cartridges	Store and send back to supplier or manufacturer.	Recycle	<i>Discuss with equipment supplier.</i>	
Domestic Wastes				
Food	Collect in plastic bags.	Landfill/Compost		

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Waste Type	Site Handling/Shipping Methodology	Treatment or Disposal Strategy	Applicable Regulations/Permits/Information	Primary Responsibility
	Take directly to storage bin. Do not store outside.	at Regional Waste Management Facility or approved landfill site.	<i>Waste Diversion Regulations, EPA Provincial Waste Management Strategy Waste Management Regulations, EPA</i>	Contractor during early works. GRDC upon implementation of contract (exception: road Contractor, reservoir clearing, ac transmission line Contractors).
Paper and Cardboard	Contractors store dry materials for collection. Place in storage bin and ship offsite to a licensed recycling facility or Regional Waste Management Facility, when required.	Landfill when applicable/ Recycle		
Plastics	Plastics of non-toxic materials to be included with regular waste and transported to landfill.	Recycle/Landfill		
Beverage Containers	Collect beverage containers accepted under the MMSB Beverage Container Recycling Program and make available to charitable organizations.	Recycle		
Tin Cans	Contractors store dry materials for collection by GRDC. Collect and store with recyclable plastics and	Recycle		

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Waste Type	Site Handling/Shipping Methodology	Treatment or Disposal Strategy	Applicable Regulations/Permits/Information	Primary Responsibility
	ship offsite to Regional Waste Management Facility.			
General Wastes	Collect and store in compactor bin. Ship offsite to a licensed facility.	Landfill		
Inert Bulk Wastes				
Passenger and light truck tires	Remove from site and transport to a licensed tire storage/disposal area. Work within the MMSB's Used Tire Recycling Program	Re-use / Recycle / Dispose offsite	<i>Waste Management Regulations, EPA MMSB – Used Tire Recycling Program</i>	Contractor
Vehicles	Drain and collect residual fluids and store in laydown area. Ship offsite via licensed metals recycler.	Recycle	<i>Waste Diversion Regulations, EPA Waste Management Regulations, EPA</i>	
Bulk Construction Debris	Stockpile in designated laydown area. Reuse/Recycle where possible. Ship offsite to Regional Landfill Site.	Reuse / Recycle / Dispose offsite		
Scrap Steel / Wire / Aluminum	Store recyclable wire or aluminum in metal bins at storage area. Store bulk steel at laydown area and ship offsite.	Recycle offsite	<i>Waste Diversion Regulations, EPA Waste Management Regulations, EPA</i>	

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Waste Type	Site Handling/Shipping Methodology	Treatment or Disposal Strategy	Applicable Regulations/Permits/Information	Primary Responsibility
Sandblast Residue	Collect at source. Store in drums at the storage area. Ship offsite or transfer to landfill.	Landfill		
Concrete	Disposal of "cow patties" at designated site. Once cured can be used in site fill material	Reuse as fill		
Special Wastes				
International Waste	Contact Canadian Border Services Agency for inspection and approval prior to off loading.	Landfill	<i>Health of Animals Act , Section 17 Health of Animals Regulations, Section 47 and 105 (3) Plant Protection Act Plan Protection Regulations</i>	Contractor
Biomedical Wastes	Store in special waste receptacles Ship offsite.	Dispose offsite		
Asbestos Waste	Requires removal at source by a licensed Asbestos Abatement Contractor.	Landfill	<i>Environment Protection Act Asbestos Abatement Regulations, 1998 The Occupational Health and Safety Act Highway Traffic Act</i>	
Human Waste	Collected at source and removed by a licensed Septic Removal Contractor.	Treatment and Disposal	<i>Public Health Act, Sanitation Regulations</i>	Contractor during early works. GRDC upon implementation of contract (exception: road

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Waste Type	Site Handling/Shipping Methodology	Treatment or Disposal Strategy	Applicable Regulations/Permits/Information	Primary Responsibility
				Contractor, reservoir clearing, ac transmission line Contractors).

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7 ESTIMATED VOLUMES OF SPECIFIC WASTE STREAMS


Potential waste streams were identified in previous sections however the primary waste streams identified at the planning stage that are expected to be generated at the Project site include domestic, sewage and construction waste. As such, waste volumes for these three waste streams have been calculated for early works and work following the start of the GRDC's mandate. In addition, two other significant wastes that have been identified include used oil and explosive boxes. The volumes of all items are calculated and shown in the sections below.

7.1 EARLY WORKS

7.1.1 Domestic Waste (Early Works)

The estimated amount of domestic waste to be generated during the first 6 months is approximately 50 tonnes. A generation rate of 1 kg/person/day was utilized to calculate this number as domestic waste directly corresponds to population or in this case the number of workers located on site.

The estimated tonnage is expected to fill approximately five, 37 yd³ compactor trucks, based on 10 tonnes per load. Figure 7-1 provides the breakdown of domestic waste volume per month.

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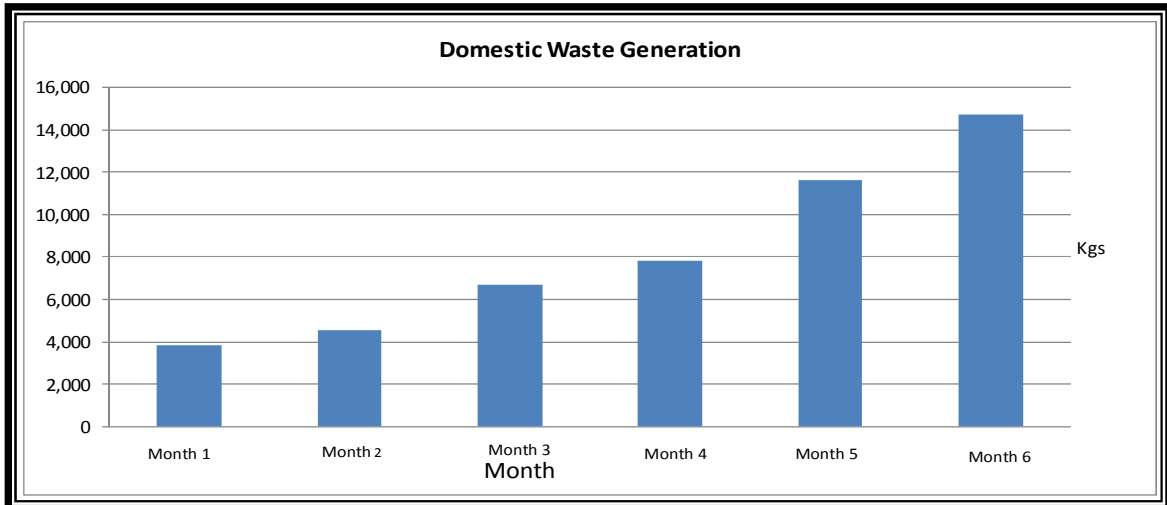



Figure 7-1: Domestic Waste Generation (pre-GDRC implementation)

7.1.2 Sewage Waste (Pre-GDRC Implementation)

During the majority of the early works, more notably during the construction of the access road, the site will be serviced with portable toilets. Based on an estimated sewage generation rate of 10 L/person/day, the total estimated amount of sewage waste to be generated prior to the start of GDRC’s mandate is about 500,000 L. Figure 7-2 provides the breakdown of sewage waste volume per month. More information about sewage disposal is located in Section 6.2.

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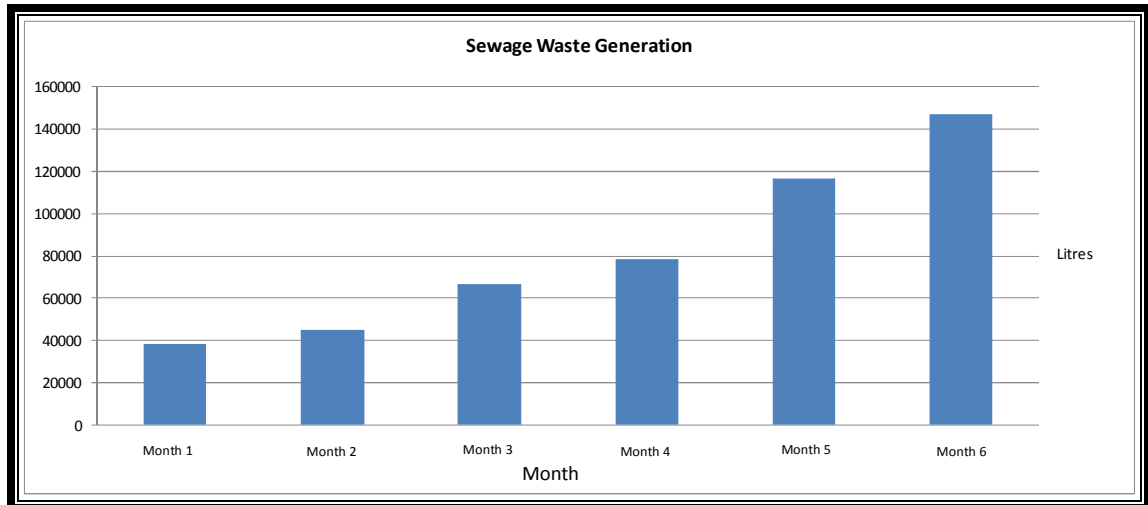


Figure 7-2: Sewage Generation (pre-GDRC implementation)

7.1.3 Construction Waste (Early Works)

7.1.3.1 Access Road


It is assumed that the amount of construction waste generated during the construction of the Access Road will be minimal, however only a small amount of formwork is expected to be needed for culvert installation. This is estimated to be approximately 500 kg or 0.5 tonnes.

In addition, the use of silt fencing will be required for protection to surrounding environment. This waste is type is estimated to be approximately 0.25 tonnes. An additional, 1 tonne is carried to account for miscellaneous construction waste items.

Therefore, based on the information above, the total amount of waste generated during the construction of the access road is estimated to be approximately 1.75 tonnes.

7.1.3.2 Accommodation Complex and Site Services Infrastructure

As with the construction of the access road, the construction of the accommodation complexes will also generate very little construction waste. Due to the

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accommodations units arriving prefabricated, the estimated amount of waste generated is low, and is made up mostly of wood cuttings generated from wooden foundation cribbing and some plastic and plywood waste. It is assumed that 225 kg of wood waste would be produced per trailer. Current estimates are that 26 trailers will be needed for an approximate total of 6000 kg or 6 tonnes.

Piping for site services will be manufactured of HDPE and will be cut and fused to the desired length. Based on an estimated overall length of 4.6 km of HDPE pipe, and an assumption of 0.1 m of wastage per 15 m of pipe, with a weight of 120 kg/15 m, the total tonnage of waste generated from piping activities is .25 tonnes.

7.1.4 Used Oil (Early Works)

A considerable amount of heavy equipment will be utilized during the early phases of the Project. In keeping with necessary maintenance schedules, Contractors are required to maintain equipment and equipment fluids. During this phase, it is estimated that nearly 16,500 litres of waste oil will be generated. More information on used oil is provided in Section 6.2.1.1.

7.1.5 Explosive Boxes (Early Works)

During the early phase of this Project, the use of explosives will be necessary for excavation of the access roads. An estimated total of 1,300 cases of explosives will be required for road construction activities. Once the explosives are removed and used during construction, the cases will be destroyed as identified in Section 6.


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Table 7-1: Estimated Waste Volumes (Early Works)

Waste Type	Estimated Volume
Domestic Waste	50 Tonnes
Sewage Waste	492,000 Litres
Construction Waste (includes Access Road, Accommodations Complex and Site Services)	8 Tonnes
Used Oil	16,500 Litres
Explosive Boxes	1,300 Cases

7.2 WORK POST GRDC AWARD

7.2.1 Domestic Waste

The total estimated amount of domestic waste to be generated from year 1 to year 6 is 1,900 tonnes. This equates to approximately, one hundred and ninety 37 yd³ compactor truck loads. Figure 7-3 provides the breakdown of domestic waste volume per year.

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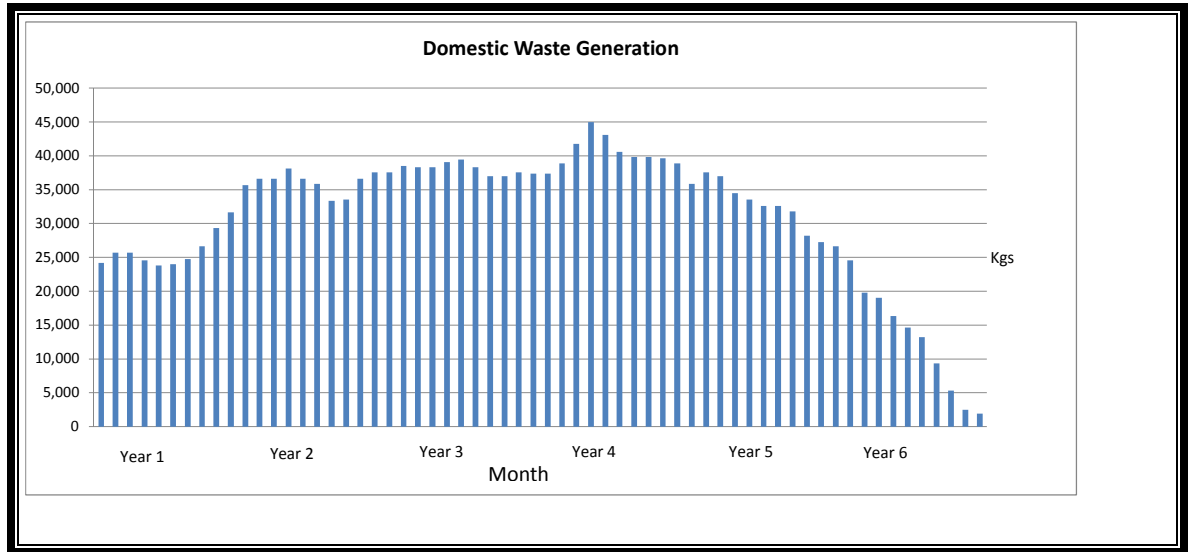



Figure 7-3: Domestic Waste Generation Year 1 to Year 6

7.2.2 Sewage Waste

Based on the assumption that the average worker generates approximately 270 L/day of sewage, the total estimated amount of sewage waste to be generated after year 1 to year 6 is estimated at 525,000,000 Litres. Although, this volume represents the total amount generated, it is expected that only 10,000 litres of sludge would be removed from the sewage treatment plant per year for a total of 50,000 litres over the life of the Project. Figure 7-4 provides the breakdown of sewage waste volume per year. More information about sewage disposal is located in Section 6.

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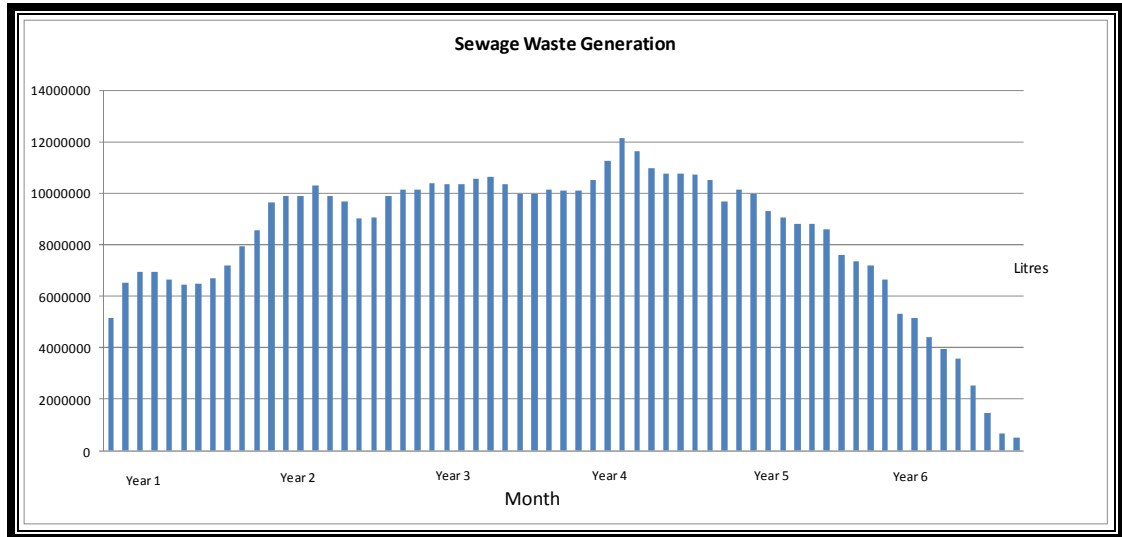


Figure 7-4: Sewage Generation Year 1 to Year 6


7.2.3 Construction Waste

Based on waste information obtained from the Bull Arm Construction Site during fabrication of the Hibernia Gravity Base Structure, the reported waste tonnage for the construction debris waste stream was 8,400 t/yr. Based on this information we can estimate a total of 42,000 tonnes over the life of this Project. Of that tonnage approximately 23,000 t is expected to be recyclable metals, including scrap rebar and with an additional 4,800 t in recyclable wood.

It is assumed that although different in scope, the LCP will likely see similar types of waste tonnages after GRDC implementation.

7.2.4 Used Oil

Similar to the section above, an estimate for waste oil is based on data obtained during fabrication of the Hibernia Gravity Base Structure. The volume of waste oil generated on site was reported to be 936,000 L/yr. This volume can be considered

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comparable based on the length of the Project and types of equipment used for a total of 4.7 million litres. More information on used oil is provided in Section 6.

7.2.5 Explosive Boxes

During the later phase of this Project, the use of explosives will be necessary during bulk excavation. An estimated total of 13,000 cases of explosives will be needed to complete this work leaving 13,000 empty cases once the explosives have been utilized. More information on explosive boxes is provided in Section 6.

Table 7-2: Estimated Waste Volumes (Year 1 to Year 6)

Waste Type	Estimated Volume
Domestic Waste	1,900 Tonnes
Sewage Waste Generated to Treatment Plant	525,000,000 Litres
Sewage Sludge Removed from Treatment Plant	50,000 Litres
Construction Waste	42,000 Tonnes
Used Oil	4,700,000 Litres
Explosive Boxes	13,000 Cases

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8 WASTE MANAGEMENT REQUIREMENTS

As part of the overall waste management plan, the LCP is committed to ensuring that every person on site is provided with the opportunity and direction to practice responsible waste management. Waste receptacles, such as recycling and waste bins, will be strategically placed throughout the site and will be clearly labelled as to what should be placed in them. Recycling bins will be placed in heavy traffic areas, common work areas, and, most importantly, in locations where recyclables are typically generated.

The details of the waste collection/disposal requirements will be finalized with the GRDC, however the following sections discusses the anticipated requirements.


8.1 STORAGE

8.1.1 Beverage Containers

Most empty beverage containers will be generated in dining halls of the starter camp and Accommodations Complex, and at construction sites frequented by a large number of people. Empty containers at remote locations shall be collected and contained by the Contractor and transported to a designated area for storage for future recycling or directly to the licensed recycling depot.

Blue bin recycling containers are recommended for use for the collection of beverage containers due to their high visibility. The use of dedicated recycling containers will serve as a reminder for personnel to use the recycling containers instead of throwing containers into the general refuse containers. The blue bin containers will be clearly labelled BEVERAGE CONTAINERS ONLY and be placed in the following areas around the site:

- Lunch Facilities
- General Office
- Maintenance Areas

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8.1.2 Residual Waste Containers

Waste receptacles shall be placed within all buildings and work areas for the collection of residual waste.

8.1.3 Roll Off/On and Front Load Containers

At minimum, it is anticipated that three wildlife proof 20' (40 yd) roll on/off containers will be needed on site to accept waste transferred from the smaller bins once they are removed from the site buildings. Two containers could be utilized for the residual waste stream, and a third will be required for substitution, when filled bins area being transported to the waste disposal site.

At least, one 7 cubic meter Front Load Container shall be placed on site to collected beverage containers. Once this bin is filled, it will be hauled to a licensed recycling depot for processing.


8.1.4 Construction and Demolition Waste Storage

During construction, individual Contractors will be responsible for collecting their wastes in acceptable containers within their workshops or laydown areas. Containers containing construction waste or large construction waste materials may be temporarily stored within the construction area upon approval on the On-site Environmental Monitor and must be stored according to applicable regulations.

Recyclable metals shall be placed in an onsite location suitable for pick up by a licensed metals recycler. Special arrangements shall be made with the recycler for large items.

8.1.5 Hazardous Waste Storage

A Hazardous Waste Storage Area will be provided for Contractors to utilize. The storage area will be designated by SLI to a Contractor for storage of hazardous waste. The Contractor shall be responsible for constructing and maintaining the site

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in compliance with applicable regulations and is ultimately responsible for disposal and removal of any waste management infrastructure and equipment.

Individual Contractors will be responsible for providing acceptable leak proof containers within their work areas. Containers for on-site hazardous waste storage shall, as a minimum, meet requirements of the *Transportation of Dangerous Goods Regulations*, as provided in <http://www.tc.gc.ca/eng/tdg/moc-menu-202.htm>.

The Contractor shall provide SLI with records of type and amount of waste deposited in and removed from site. SLI will monitor the storage area to ensure that Contractors store waste in a safe manner. The Contractor shall ensure that containers are removed from site on an as needed basis to a licensed hazardous waste facility for disposal.


Storage shall comply with provisions of the National Fire Code to ensure that incompatible wastes are not stored together.

All Contractors that generate handle, store, and/or transport hazardous materials and hazardous wastes shall each be required to meet all regulatory requirements that pertain to their involvement with these materials/wastes. These Contractors shall have all resources (including employees who have completed training programs acceptable to the Engineer), meet all licensing/permitting requirements of applicable federal and provincial regulations, and provide spill response resources and capabilities consistent with the Project's Master Spill Response Plan.

8.2 FUTURE WASTE MANAGEMENT REQUIREMENTS

Future provincial waste management requirements may dictate the separation of various waste streams at source. In the event that a regional plan is implemented, this Waste Management Plan will require revisions and operation changes will be needed.

These changes may result in the use of additional source separation techniques and equipment.

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8.3 CONTINGENCY PLANS

An adverse event is one that can result in potential negative effects on the health and safety of site personnel, Contractors, the public, or the environment. The following sections describe potential adverse events and appropriate responses to deal effectively with them.

Note that the federal *Transportation of Dangerous Goods Regulations* requires an approved *Emergency Response Assistance Plan* for those who transport explosives. Such a plan, when implemented effectively in response to an incident involving explosives, helps mitigate environmental effects.


The Project's *Master Spill Response Plan* is another document intended to facilitate an effective response to a spill incident aimed at mitigating effects of spills of oil, fuels, and other hazardous materials.

Proactive measures to anticipate and prepare for adverse events are expected of all Project participants, particularly those tasked with waste management.

8.3.1 Improper Disposal

Any instances of improperly disposed of materials identified by onsite Environmental Monitors or other Project participants shall be reported immediately to SLI's Construction Manager and Environmental Coordinator (Hydro), and investigated. The responsible Contractor shall be required to remove the waste and dispose of it in a manner acceptable to the Engineer. This will include waste characterization, as directed by the Engineer, to identify the nature of the improperly disposed of material so that acceptable storage, transport, and disposal options can be identified. If a responsible party cannot be identified, arrangements will be made by the onsite Environmental Monitor to have the waste removed and transferred for disposal. For example, recyclable material will be removed from the non-recyclable waste stream.

If hazardous wastes are suspected to be improperly disposed of, then this material will be characterized. If safe and practical to do so, the material will then be placed in

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dedicated storage containers separate from other waste types that have not come into contact with the hazardous materials, and transported to and disposed of at a licensed hazardous waste disposal facility.

8.3.2 Fire

In the event of fire associated with wastes, the onsite Environmental Monitors shall be notified and the emergency response unit shall be dispatched immediately in accordance with the procedures outlined in the Project's Emergency Response Plan.


Because even small fires can quickly escalate into a dangerous situation, particularly when hazardous materials (fuels, chemicals, etc) and wastes are involved, it is imperative that the emergency response unit be dispatched immediately.

As a pro-active measure aimed at preventing fires, Contractors shall use approved storage containers and waste handlers shall be familiar with hazardous waste compatibility profiles. Non-compatible wastes will be segregated.

8.3.3 Extreme Weather Conditions

At times when forecasts call for extreme weather events (e.g. snow, rain, wind, etc), the Construction Manager at his/her discretion shall issue instructions with respect to waste management activities on site. This may include a temporary suspension of waste collection and transportation until the weather improves. In addition, the Construction Manager may also issue instructions to inspect and secure waste containers and storage sites to reduce potential for uncontrolled releases of waste to the environment.

Provisions will be made to allow at least two days of waste storage on site to allow for such adverse weather conditions.

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8.3.4 Vehicular Accidents


In the event of a vehicular accident that results in a spill of a waste material, the Contractor shall notify a SLI Onsite Environmental Monitor of the incident and the emergency response unit will be dispatched immediately in accordance with procedures outlined in the Project's Emergency Response Plan and Master Spill Response Plan, as required.

Depending on the waste type, the Contractor may be required additional notifications. In the case of accidents involving transport of explosives, the *Emergency Response Assistance Plan* shall be implemented, in accordance with provisions of the *Transportation of Dangerous Goods Regulations*.


8.3.5 Contingency Planning

Each Contractor shall address several key elements associated with managing an adverse event through the development of a contingency plan which shall be included in the contract specific EPP. The plan shall include the following:

- Location and nature of the work;
- Types of waste being transported;
- Identification of the types of emergencies that maybe reasonably expected to occur and the potential effect involving public health and safety, environment and property;
- Resources including personnel and/or sub-contractors accountable for waste management procedures;
- Roles and Responsibilities of all key personnel, responders, organizations and other agencies who have specific responsibilities under the event.
- Description of how the plan shall be implemented and who it shall be reported to, including;


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- Government assistance contacts
- Response equipment and material suppliers
- Clean up Contractors
- Fire and Emergency Authorities
- Hospitals
- SLI Contact
- Remediation Procedures
- Disposal procedures
- Reporting procedure, including:
 - Date and time of release;
 - Weather conditions;
 - Cause of the release;
 - Substance and quantity involved;
 - Affected environment;
 - Identification of all parties and individuals involved in the incident and response;
 - Identification of all those affected;
 - Containment procedure;
 - Clean up techniques;
 - Short and long term impacts
 - Measures to be implemented to prevent any re-occurrence.
- Validation, updating and maintenance procedure of the plan

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9 TRAINING

All operations personnel involved in the handling of hazardous and non-hazardous wastes will be fully trained for 'Personal Safety and Protection'. They will also be trained in emergency response and environmental protection. Contractors will be required to provide trained, qualified and experienced personnel for waste management duties. In addition, all personnel entering the site will be given basic instructions for complying with the Site Waste Management and Recycling Policy.

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10 SURVEILLANCE AND MONITORING

The onsite Environmental Monitors will proactively identify any requirements for maintenance work and report the need for repairs. Routine inspection schedules will be maintained to minimize the potential for leaks or pollution and a record will be kept of the maintenance needs and servicing performed. During construction, weekly inspections of the various waste collection and disposal points, the inventory of bulk wastes, the waste management data sheets, the status of the protective equipment and the spill kits will take place. Any non-conformance will be tracked and recorded and necessary corrective action identified.

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11 REFERENCES


Title
DOEC Guidance Documents for Municipal Solid Waste Transfer Stations
DOEC Guidance Documents for Construction and Demolition Waste Disposal Sites
DOEC Guidance Documents for Permanent Household Hazardous Waste Depots
Guidelines for Establishment and Operation of Facilities for the Outdoor Storage of Tires
DOEC Guidance Document for the Management of Impacted Sites

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12 FORMS

REVISION REQUEST FORM

Section to be Reviewed:	
Nature of Revision:	
Rationale for Revision: (i.e., environmental/worker safety, etc.)	
Submitted by:	Submission Date:


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RECEIPT OF REVISION ACKNOWLEDGMENT FORM

I _____ acknowledge receipt of revision _____ of the
 Waste Management Plan, SLI Document Number 505573-0000-68RA-I-0008.


 Signature

 Date

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APPENDIX A

Examples of Acceptable Wildlife - Proof Disposal Bins


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BearSaver

*Bear Resistant Refuse, Recycling
and Food Storage Solutions*



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BE Series Trash/Recycling Container



Manufactured by the North American leaders in bear-resistant containers.

Available in single and double configurations, the large capacity Model BE Series containers are equally suited for refuse or recycling. Incredible quality and durability makes these all-weather containers great for any application.


- ▶ Tilt Out Bag Rack
- ▶ Bear-Resistant and Accessible to Persons with Disabilities
- ▶ 70 Gallon Single Models and 140 Gallon Double Models Available
- ▶ Rear Service Door
- ▶ Optional Custom Laser Cut Designs
- ▶ Refuse, Recycling, or Combo Configurations
- ▶ Corrosion Resistant Materials and Powder Coated Finishes
- ▶ Standard Colors are Forest Brown, Fir Green, Olive Green, Blue and Black

CE Series Trash/Recycling Container



Available in single and double configurations, the CE Series trash and recycling containers are used widely by the NPS and USFS with great success. These heavy-duty, ADA approved products are a good choice where accessibility compliance is required. The top-loading pull down chutes make these models operable even with a closed fist. Uses a standard 32 gallon trash can inside.

- ▶ User Friendly Loading Chutes for Trash and Tubes for Recycling
- ▶ Bear Resistant and ADA Compliant
- ▶ Front Service Door
- ▶ Trash, Recycling, or Combo Configurations
- ▶ Corrosion Resistant Materials and Powder Coated Finishes
- ▶ Standard Colors are Forest Brown, Fir Green, Olive Green, Blue and Black

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HA Series Trash/Recycling Container



Manufactured by the North American leaders in bear-resistant containers.

Available in single and double configurations, the Model HA Series containers are equally suited for trash or recycling. Incredible quality and durability makes these all-weather containers great for any application. The stylish design allows placement in locations like visitor centers and downtown city streets where aesthetics are important.

- ▶ **Bear-Resistant and ADA Compliant**
- ▶ **Front Service Door**
- ▶ **Optional Recycled Plastic Wood Siding or Custom Laser Cut Designs**
- ▶ **Trash, Recycling, or Combo Configurations**
- ▶ **Corrosion Resistant Materials and Powder Coated Finishes**
- ▶ **Standard Colors are Forest Brown, Fir Green, Olive Green, Blue and Black**


HID-A-BAG Trash/Recycling Container



Available in four sizes with trash, recycle or combination options.

Also available in single or double configurations, some models are even ADA Compliant! The Hid-A-Bag is a well known, widely used line of products with a long standing track record of exceptional durability.

- ▶ **Tilt Out Bag Rack**
- ▶ **Bear-Resistant**
- ▶ **Options that are Accessible to Persons with Disabilities**
- ▶ **32, 64, 70 and 140 Gallon Models Available**
- ▶ **Rear Service Door**
- ▶ **Refuse, Recycling, or Combo Configurations**
- ▶ **Corrosion Resistant Materials and Powder Coated Finishes**
- ▶ **Standard Colors are Forest Brown, Fir Green, Olive Green, Blue and Black**

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Food Storage Lockers

Manufactured by the North American leaders in bear-resistant containers.

BearSaver Bear-Resistant Food Storage Lockers are rugged, high quality metal enclosures designed for safe and convenient food storage in campgrounds, picnic areas and trailheads. Our intermediate sized lockers are 15 (FS15) and 20 cubic feet, which are perfect for smaller campsites and trailheads. The 24 (FS24) and 30 (FS30) cu/ft lockers are large enough to hold an entire family's food supply including two large ice chests.

The **BearSaver** latching system uses a pocket style touch latch with double spring bolt actuation on its standard enclosures. Our pocket style, self-closing touch latch is composed of zinc plated steel components and hardware. A child safety release handle on the inside of the enclosure is provided. The design is very simple for users to operate but is beyond the capabilities of bears. It has a clean, attractive appearance and is ADA compliant in terms of height, reach and required pounds of operating force.



Model FS15
15 Cubic Foot Capacity Food Storage Locker

This small to intermediate sized food storage locker is perfect for trailheads, day use areas, tent cabin areas and small campsites. There is a center shelf built in to take advantage of the 15 cubic foot capacity. With provisions to bolt side-by-side, these lockers can easily be lined up for group usage.

Model FS20
20 Cubic Foot Capacity Food Storage Locker

This is an economically priced, intermediate sized food storage locker with enough capacity (20 cubic feet) for a regular sized cooler and room left over for a few dry goods. Primarily used in campsites, the FS20 can also be used at trailheads and public use areas.



Model FS24
24 Cubic Foot Capacity Food Storage Locker

One of most popular models, the FS24 has enough capacity (24 cubic feet) for a family who is camping for a week. There is room for two regular sized coolers and plenty of space left over for dry goods. Always paying attention to detail we have added hooks on the ceiling of the locker for hanging bags of dry goods. These heavy-duty enclosures with easy to use, selflatching doors will provide years of reliable services in all weather conditions.


Model FS30
30 Cubic Foot Capacity Food Storage Locker

Our largest and best selling food storage locker, the FS30 has a full 30 cubic feet of interior space to accommodate large families on extended stays. With the capacity to hold the largest of coolers and lots of dry provisions, this big locker removes the worries associated with keeping food in your car overnight.



Models FS24RCE and FS26G

These new style food storage lockers are unique in design and made for large families. The sloped roofs are great for heavy snow loads with all the quality and durability you would expect from BearSaver.

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RCE Series Residential Waste Enclosures



Manufactured by the North American leaders in bear-resistant containers.

Our line of residential waste enclosures keeps with the BearSaver tradition of producing tough, functional, long lasting outdoor equipment. The RCE Series enclosures are manufactured using the same materials and finishes as our line of commercial trash enclosures, which are used widely throughout the U.S. and Canada. Our proven, field tested outdoor enclosures will provide years of trouble-free service in all weather conditions. If you are looking to keep hungry bears out of your trash, BearSaver has the solution you need.

Available in 3 Sizes

- ▶ **RCE130F** Holds (1) 30-gallon Rubbermaid can (included with purchase). This model has a slim profile and can be easily bolted side-by-side for added capacity.
- ▶ **RCE230F or RCE230G** Holds (2) 30-gallon Rubbermaid cans (included with purchase) and has a large top-loading lid. Available with sloped or gabled roof.
- ▶ **RCE132F** Holds (1) standard 32-gallon can (not included) and can be bolted side-by-side for added capacity.
- ▶ **RCE330G** Holds (3) cans 30-gallon Rubbermaid cans (included with purchase) and has a gabled roof.


All models have provisions to either bolt down to a slab or use the BearSaver pole mount installation method. See website for details.

Mini Depot Trash/Recycling Container



Designed to hold three different recyclables, the Mini Depot can be configured just by changing the decals. Standard openings are 5" x 5" but a 5" x 10" opening can be ordered in the center position for trash input. Heavy steel construction insures years of service in the most demanding environments. With a baffle plate installed on the inside beneath the loading holes, bears (or people) cannot remove the contents.

- ▶ **Easy Loading and Unloading**
- ▶ **Bear Resistant and ADA Compliant**
- ▶ **Lockable Front Service Doors, 90 Gallon Capacity**
- ▶ **Trash, Recycling, or Combo Configurations**
- ▶ **Corrosion Resistant Materials and Powder Coated Finishes**
- ▶ **Standard Colors are Forest Brown, Fir Green, Olive Green, Blue and Black**

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Commercial Containers



Manufactured by the North American leaders in bear-resistant containers.

Standard dumpsters with two loading doors are available in front load 2, 3, and 4 yard sizes. Counter-balance lid dumpsters are available in front load 2, 3, 4, 5 and 6 yard sizes. The standard dumpsters have front loading, swing-open doors so getting trash or recyclables inside is easy and clean. The counter-balance lid dumpsters use a creative latching system that requires only one finger to open. The counter-balance effect makes the tops light and easy to open. On either model, dumping is made easy by gravity latches releasing the unloading lid during the emptying process. Clip-down lids are also available as an option.

- ▶ 2, 3 and 4 Yard Front Load Styles for Trash
- ▶ Pole Mounting Options to Avoid Tipping
- ▶ Gravity Latches or Clip-Down Lids
- ▶ Bear-Resistant and Rodent Proof
- ▶ Corrosion Resistant Materials and Powder Coated Finishes
- ▶ Standard Colors are Forest Brown, Fir Green, Olive Green, Blue and Black

Bear Resistant Poly Cart



The BearSaver™ bear-resistant carts are available in 32, 65 and 95 gallon sizes as well as three (3) levels of protection: basic, moderate and high.


- ▶ Special latch box under the bib prevents animal entry
- ▶ Snap shut lid means no manual relatching is required
- ▶ Designed for manual and semi-automated collection systems

Cart Options

The Grizzly Model A fully secured cart offering the maximum level of protection. Bear resistant latch, steel reinforced side rails, lid, back corners, back stiffener and handle area. Perfect for heavy bears like grizzlies.

The Black Bear Model A tough black bear resistant cart offering a medium level of protection. Bear resistant latch, steel reinforced side rails, back corners and lid.

The Varmint Model The economy version of our rolling cart family. Great protection from raccoons, squirrels, coyotes, pets and all other small animals. A bear resistant latch and steel reinforced lid offers "lock down" protection at an affordable price.

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Nalcor Energy – Lower Churchill Project



Master Spill Response Plan

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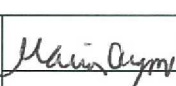
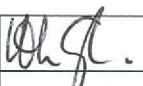



Comments:						Total # of Pages (Including Cover): 34	
B2	19-Dec-2012	Revised based on Regulatory Review	 M. Organ	 K. Sparkes	 S. O'Brien	 R. Power	 David Riffe
B1	27-Sep-2012	Issued for use					
A1	31-Aug-2012	Issued for Review					
Status/ Revision	Date	Reason For Issue	Prepared By	Checked By	Project Manager - Muskrat Falls	General Project Manager	Health & Safety
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1.0 Purpose

This Master Spill Response Plan (MSRP) is a component of the Lower Churchill Project's overall Emergency Response Plan (ERP) and compliments the Project-Wide Environmental Protection Plan (P-WEPP).

This MSRP provides expectations and guidance for contractors who are required to develop a Spill Response Plan (SRP) as a component of their Contract-Specific Environmental Protection Plans (C-SEPP). The MSRP also identifies responsibilities and communication procedures to follow in the event of a spill.

2.0 Scope

This MSRP is applicable to the activities associated with construction of the Muskrat Falls Generation.

3.0 Definitions

Contractor	Means any vendor/manufacturer who enters into a Contract (including a Purchase Order) with Owner for the supply of work or services.
Incident	Undesired event with potential to result in injury or harm to people, damage to equipment, property or the environment, or where there is a loss of process. For this procedure, an incident will also include any high potential, near miss situations.
On-Scene Commander	An employee of the contractor with suitable training, experience and authority to direct the contractor's spill response efforts.
Deleterious Substance	Generally means any substance that, if added to water, would degrade or alter the quality of the water so that it is rendered deleterious to fish or fish habitat.
Recordable Spill	Those incidents that do not meet the reporting requirements as outlined in the definition of "Reportable Spill" and therefore do not require reporting to regulatory agencies.

Reportable Spill	A spill or leak greater than 70 litres on land; a spill or leak on land, regardless of quantity, that has the potential to contaminate nearby property or enter a water body or sewer; or, a spill or leak in the water, regardless of quantity.
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4.0 Abbreviations and Acronyms

In this document the following terms shall have the meanings set forth below and for clarity are shown with all letters capitalized. The definition covers the singular as well as the plural.

C-SEPP	Contract-Specific Environmental Protection Plan
DOEC	Department of Environment and Conservation
EPCM	Engineering, Procurement and Construction Management
HMSSR	Hazardous Materials Spill Status Report
MFEOC	Muskrat Falls Emergency Operations Centre
MSDS	Material Safety Data Sheet
MSRP	Master Spill Response Plan
P-WEPP	Wide Environmental Protection Plan
PPE	Personal Protective Equipment
SRP	Spill Response Plan
ERP	Emergency Response Plan

5.0 Reference Documents

LCP-PT-MD-0000-EV-PL-0001-01	ECP Environmental Management Plan
LCP-PT-MD-0000-HS-PL-0004-01	Emergency Response Plan
LCP-PT-MD-0000-RT-PL-0001-01	Regulatory Compliance Plan
The Canadian Environmental Protection Act	
Environmental Protection Act	
Fisheries Act	
Storage and Handling of Gasoline and Associated Products Regulations	

6.0 Responsibilities

6.1 Contractor

Contractors are required to implement a Spill Response Plan (SRP) and lead and coordinate any field response to environmental incidents related to their activities, including any necessary third party involvement (e.g. vacuum truck, environmental consultant, waste disposal). Site remediation, including any required professional consultant reports, is part of the contractors clean up responsibilities.

In the event of a spill, the responsible party (i.e. the contractor) will promptly notify an Engineering, Procurement and Construction Management (EPCM) Representative and report the spill to government agencies, as required.

The contractor shall document all incidents (completion of Hazardous Material Spill Status Report Form, or suitable equivalent) and investigate as required or directed. Forms and reports are to be provided to the EPCM Representative and Nalcor Energy (Muskrat Falls Site Manager and Environmental and Regulatory Compliance Lead).

The contractor is responsible to have appropriately trained personnel on site and provide training records upon request. Contractors must document a test of their SRPs at least annually.

6.2 EPCM Representative and/or On-Site Environmental Monitor

The EPCM Representative and/or On-Site Environmental Monitor will oversee the contractor's response and provide notification and documentation to Nalcor Energy's Muskrat Falls Site Manager and Environmental and Regulatory Compliance Lead.

6.3 Nalcor Energy's Muskrat Falls Site Manager

Where an incident requires additional support, or where the situation presents an elevated risk, the Muskrat Falls Emergency Operations Centre (MFEOC) will be engaged as per the Project's Emergency Response Plan (LCP-PT-MD-0000-HS-PL-0004-01). The responsibility to engage the MFEOC rests with the Muskrat Falls Site Manager, who also assumes the role of Incident Commander.

6.4 Nalcor Energy's Environmental and Regulatory Compliance Lead

The Environmental and Regulatory Compliance Lead is required to confirm when a SRP is required and accept contractor SRPs prior to work commencement.

The Environmental and Regulatory Compliance Lead is responsible for all communications and information sharing with government agencies, once the contractor reports the incident.

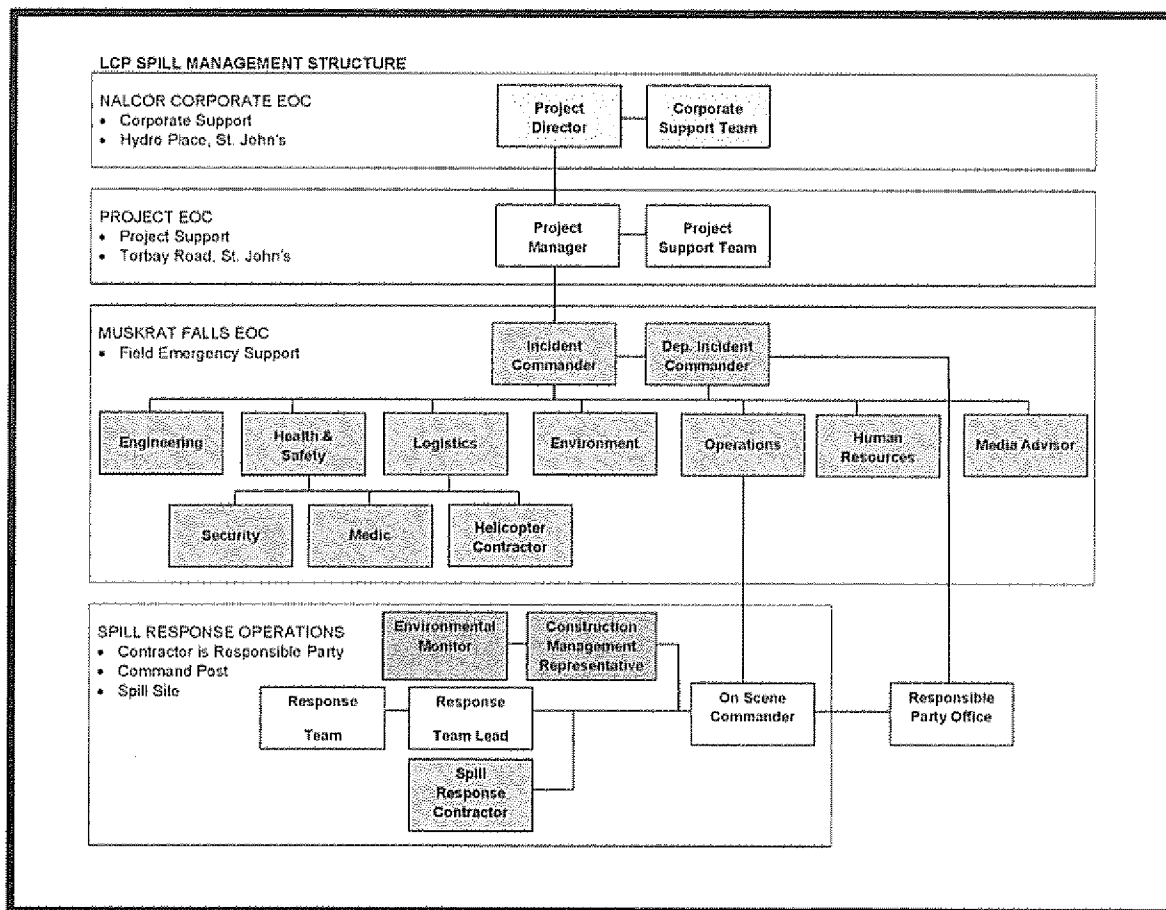
The Environmental and Regulatory Compliance Lead reviews and updates the MSRP at least annually.

6.5 Nalcor Energy Emergency Operations

Further support from the Project and/or Corporate Emergency Operations Centres will be available as required. The procedure and requirements to notify or engage higher level support are described in the ERP for various emergency situations.

The general organization of the complete spill management structure for the Project is illustrated below.

Figure 6.1: Spill Management Structure



7.0 Contractor Spill Response Plans

Contractors will be required to have a Contract-Specific Environmental Protection Plan (C-SEPP). The C-SEPP will include a Spill Response Plan (SRP) that addresses the types of products (fuels and hazardous materials) being used, the activities that are being carried out and the nature of the work environment. At the discretion of Nalcor Energy's Environmental and Regulatory Compliance Lead, contractors may be exempt from the requirement for a SRP.

All C-SEPPs (and SRPs) will be accepted by Nalcor Energy's Environmental and Regulatory Compliance Lead prior to commencement of work. Contractor SRPs will conform to the requirements and responsibilities specified in this Master Spill Response Plan and contain similar spill response strategies.

8.0 Legislation and Reporting

8.1 Provincial Legislation

If a petroleum product is accidentally spilled onto soil or into a body of water, it is primarily within the jurisdiction of the Department of Environment and Conservation (DOEC). The provincial *Environmental Protection Act*, and its regulations, govern such incidents. Water courses frequented by fish and low tidal zones are overlapping Provincial/Federal jurisdictions and the federal aspect of these areas is outlined in Section 8.2.

In accordance with the *Environmental Protection Act*, the Minister of the DOEC has designated officials, with Service NL, authorized to perform and exercise those duties and powers conferred by the Act upon the Minister. Service NL officials are responsible for dealing with oil spills/leaks. Services NL official also provide response capability, expertise and support for environmental emergencies on a 24 hour basis.

The *Environmental Protection Act* generally states that a person shall not release or permit the release of a substance into the environment in an amount, concentration or level, or at a rate of release that in the opinion of the Minister causes or may cause an adverse effect, unless authorized under the Act or an approval issued under the Act.

The *Environmental Protection Act* also states that the person responsible for the release (i.e. the owner or operator, or the person who has the care, management and control of the substance released) must report the release and notify any persons or property owners potentially affected by the release. A person responsible for the release must also take all reasonable measures to prevent, reduce and remedy the adverse effects of the substance, remove or otherwise dispose of the substance in a manner that minimizes adverse effects, and rehabilitate the environment to the satisfaction of the Service NL/DOEC.

The *Storage and Handling of Gasoline and Associated Products Regulations*, defines a "Spill" as any loss of gasoline or associated products in excess of 70 litres from a storage tank system, pipeline, tank vessel, or vehicle onto or into soil or water. A "Leak" is defined as any discharge of gasoline or associated products from a storage tank system, pipeline, tank vessel, tank car or tank vehicle, other than through the usual function for which the storage tank system or pipeline was designed.

In the event of a spill or leak, the person responsible shall immediately notify Service NL/DOEC, and take such steps as are necessary to abate the discharge, clean the area affected and restore the environment to the satisfaction of Service NL/DOEC. However, it should be noted that an agreement is in place between the provincial and federal governments whereby all spills must be reported to the Canadian Coast Guard Emergency Response Spill Line as per Section 8.3.

Based on discussions with Service NL/DOEC it has been confirmed that the requirement for immediate reporting is to be applied to any spill or leak greater than 70 litres or a spill or leak, regardless of quantity, that has the potential to contaminate nearby property or enter a body of water or sewer system.

All waste oil and contaminated materials resulting from a spill or leak must be handled and disposed of in accordance with the requirements of the *Environmental Protection Act*. Service NL/DOEC is responsible for the approval of appropriate disposal facilities and procedures.

8.2 Federal Legislation

Under the *Fisheries Act*, where there occurs a deposit of a deleterious substance in water frequented by fish, or a serious or imminent danger thereof, any person who owns the deleterious substance or causes the deposit shall report such occurrence. As well, any person responsible must as soon as possible, take all reasonable measures consistent with safety and with conservation of fish and fish habitat to prevent the deposit. A deleterious substance is given a broad definition and generally means any substance that, if added to water, would degrade or alter the quality of the water so that it is rendered deleterious to fish or fish habitat.

The *Canadian Environmental Protection Act* governs the reporting and remedial measures that must be implemented in the event of a release into the environment, or reasonable likelihood of a release into the environment, of a substance that is identified as a Toxic Substance.

The *Migratory Birds Convention Act* and its regulations make it an offence to deposit oil, oily waste or other substances harmful to migratory birds into water inhabited by migratory birds. This act is administered by the Canadian Wildlife Service of Environment Canada.

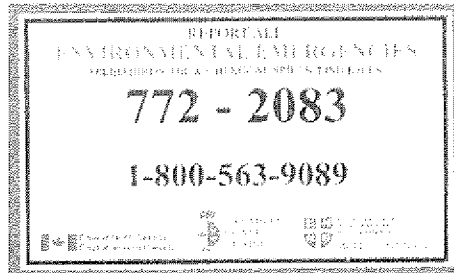
8.3 Reportable Spills and/or Leaks

Based on a review of relevant legislation, and in consultation with regulatory authorities, immediate reporting to government is required for:

- A spill or leak greater than 70 litres on land;
- A spill or leak on land, regardless of quantity, that has the potential to contaminate nearby property or enter a water body or sewer;
- A spill or leak in the water, regardless of quantity; or

- A spill or leak from a registered stationary storage tank as per the GAP regulations.

Unless otherwise agreed on-site, the person responsible for the spill (in most cases, the contractor) must report the spill to government as soon as practicable, preferably within 2 hours from the time of occurrence. Reporting must be made to regulatory authorities via the Environmental Emergency Report Line at **(709) 772-2083** (collect calls accepted) or **1-800-563-9089**.



When reporting the incident, the reporting party must provide any available spill information, such as that contained on their spill report form or Hazardous Materials Spill Status Report (HMSSR). Reported information will then be relayed to all relevant regulatory agencies.

PCBs are not planned for use on the Project and PCB specific reporting requirements are not described.

8.4 Recordable Spills and/or Leaks

Spills not meeting the requirements for reporting to regulatory authorities, as outlined above, are considered recordable.

In the event of a recordable spill, the observer and/or the person responsible will ensure an effective response is carried out and that the incident is reported to their immediate supervisor as soon as possible. The supervisor will promptly report the incident to the EPCM Representative and ensure the incident is documented and investigated as required.

8.5 Hazardous Material Spill Status Report

The Hazardous Material Spill Status Report (HMSSR) is designed to ensure consistent documentation of information related to a spill event (reportable or recordable), including the response and remediation efforts. The HMSSR may be used to communicate and/or distribute information to interested personnel, both internally and to government agencies. Appendix A

contains a copy of the HMSSR. Contractors may use their own spill report form, provided it conforms to this standard.

It is the responsibility of the Contractor's On Scene Commander to ensure that the HMSSR (or suitable spill report form) is completed and provided to the EPCM Representative and/or On-Site Environmental Monitor, including any follow-up or final versions of the report.

Initial, follow-up and final reports will be provided to Nalcor Energy (i.e. Muskrat Falls Site Manager and Environmental and Regulatory Compliance Lead) as soon as they are available. Nalcor Energy's Environmental and Regulatory Compliance Lead will ensure documentation and information is shared with the appropriate regulators, as required.

9.0 Training

Contractor personnel will be trained in spill response, except those contractors not requiring a SRP as determined by Nalcor's Environmental and Regulatory Compliance Lead. Workers should receive basic spill response training focused on safe work practices, response techniques and general awareness of the requirements of their SRP. Additionally, contractors will, at all times, have personnel available that are capable of fulfilling the On Scene Commander role. On Scene Commanders generally require a higher level of training and emergency response experience.

Contractors will provide records of personnel training, and details of training programs completed, upon request. The 40 hour HAZWOPER training is recommended for personnel working around hazardous substances.

All On-Site Environmental Monitors will be trained in spill response. Construction Management and Nalcor Energy personnel will receive training as required depending on their roles and responsibilities. Training will be documented appropriately.

10.0 Plan Maintenance

10.1 Plan Testing

Contractors will test their Spill Response Plans (SRP) at least annually. Tests are to be completed in conjunction with an On-Site Environmental Monitor and may include desk-top exercises or operational exercises. Upon completion of a SRP test, a brief report outlining the type of exercise performed, and any deficiencies and/or areas for future improvement will be completed and provided to the On-Site Environmental Monitor.

10.2 Reviewing and Updating

This MSRP will be reviewed by Nalcor Energy's Environmental and Regulatory Compliance Lead annually, or as required to incorporate changes to planned activities and scope of application. The occurrence of environmental incidents and emergency situations may also lead to plan review and updating.

11.0 Spill Response

Spill response efforts, and contractor SRPs, will conform to the following basic strategy in the event of an oil or hazardous material spill or leak:

- 1) Determine the type of product;
- 2) Assess the situation and determine appropriate PPE and required safety measures;
- 3) Identify priorities while considering the threat to people, property and the environment;
- 4) Initiate the appropriate response actions;
 - Stop and/or contain the source of the spill;
 - Identify the product and estimate the quantity;
 - Contact emergency personnel and request additional support if necessary;
 - Initiate the containment and recovery of any free product and/or contaminated material;
- 5) Ensure required reporting and notification is carried out.
- 6) Dispose of all waste material in the appropriate manner;
- 7) Restore the site to the satisfaction of the Project representative or governing regulatory body;
- 8) Document and investigate as required.

11.1 Control, Containment and Cleanup Procedures

In spill response, time is of the essence – the actions taken in the first few hours, or even minutes, determine the extent of the impact. Even small spills can have disastrous results under the right circumstances. Safety will be the first consideration and the response will be

planned accordingly. The following procedures shall be used for stable oil type spills only. Spills of hazardous materials may require different clean up techniques.

11.1.1 Spill Control

Controlling the spill means stopping the cause or source of product, or slowing down the rate of its release. The following measures are intended to provide general guidance for effective spill control. In the event of a spill, the responsible party (i.e. the Contractor) will ensure that they:

- Immediately take control of the situation.
- Wear the proper personal protective equipment (PPE). Some spill or leak situations could involve substances that require specific PPE.
- Evaluate and implement evacuation of the immediate area if required.
- Stop the source of the spill or leak if possible and safe to do so. This may be achieved by turning off a valve, or turning a container upright, etc.
- Assess the direction and rate of flow of the spilled product. Local topography and permeability of the soil may influence the products behaviour.
- Identify type of spilled material via placards or other forms of identification on receptacles or otherwise.
- Identify potential hazards and/or environmentally sensitive areas. Search for causes of ignition. Put out any flames or turn off any equipment that may be operating in the area. Sensitive areas should be protected if possible (i.e. drinking water sources, private property, streams etc.).
- Initiate communication and notification procedures as required by the SRP. The sooner relevant personnel are identified the sooner assistance can be provided.

11.1.2 Spill Containment

Containment of a spill limits the extent of the impacted area and minimizes the potential for environmental damage and impact to other properties. The following measures provide general guidance for the responsible party (i.e. the Contractor) for effective spill containment:

- Identify points, locations or techniques to efficiently contain as much of the spilled material as possible. This may involve the use of locally available materials (i.e. soil or snow) or traditional emergency response materials (i.e. absorbent pads, booms, sox).

- If the incident has occurred near any type of drainage system (i.e. floor drains, catch basins or ditches) take measures to prevent product from entering them.
- The occurrence of bedrock near the surface may allow the use of trenches, dug across the direction of flow, to quickly recover the spilled material.
- If the incident has occurred in a location with existing containment (e.g. a building or a dyked area), make sure all drains are closed and/or discharge systems are stopped.
- Surround the spill with absorbent booms or socks. Enclose the area of contamination. In many situations locally available materials (i.e. soil or snow) may also be used.

11.1.3 Spill Clean-up

Cleanup involves the removal of contaminated material (i.e. soil, water, snow, vegetation, etc.) and any free product from the affected area. The proper disposal of any waste materials is the final step in any cleanup. The following guidance is provided for the responsible party (i.e. the Contractor) for effective clean up:

- Place absorbent pads, pillows or rolls directly on the liquid. Scatter the absorbents in different areas to aid in the cleanup. Continue placing and replacing absorbents until the last drop of free product is absorbed.
- The recovery of free product may also be accomplished by using pumps or skimming devices, particularly if the volume of spilled product is large.
- As much free product as possible should be recovered from all absorbent materials prior to their final disposal.
- Any free product and contaminated material recovered may have to be temporarily stored on-site in drums, heavy duty bags, tanks or other appropriate containers.
- Additional equipment and/or personnel may have to be mobilized to site. Specialized spill response teams or consultants may be engaged, at the expense of the responsible party, to assist or collect samples for analysis.
- All waste material will be disposed of in accordance with Regulatory requirements (i.e. approved waste disposal sites and/or special waste handling companies).
- Prior to permanently backfilling an impacted site, the responsible party must demonstrate that the impacted area has been remediated to the appropriate standard. Confirmatory

sampling may be required depending on the nature of the incident and direction received from the regulator and/or a Project representative.

Excavating equipment, haul trucks, tank trucks, drums, pumps, and hoses will be requisitioned as required for the situation by the responsible party. Such equipment may be available locally from other contractors or from nearby communities. The requirement for additional personnel and/or equipment will be coordinated by the contractor's On-Scene Commander. The On-Site Environmental Monitor and/or MFEOC personnel may be able to assist in the event that significant resources and higher level response coordination are necessary.

In winter, oil and other hydrocarbons do not penetrate frozen ground as rapidly and may collect in a depression where it can be easily recovered. The collected product can be pumped or absorbed with absorbent material or snow and put into suitable drums or containers to await disposal. However, if there is a heavy snow cover, the direction of flow and full extent of contamination may be difficult to determine without some investigation. In some cases, and only with approval of Nalcor Energy's Environmental and Regulatory Compliance Lead, additional investigation and cleanup may be delayed until the area is free of snow.

11.2 Disposal

All waste material will be disposed of in accordance with Regulatory requirements and the Project's Waste Management Plan. Similar to other types of wastes outlined in the WMP, reasonable effort shall be made to reducing and segregating the amount of waste generated during a spill, provided that clean up and control is not compromised. The contractor is responsible for proper temporary storage and disposal but may receive guidance from the On-Site Environmental Monitor or other Project personnel. Where disposal requires special permission or negotiation with regulatory agencies, Nalcor Energy's Environmental and Regulatory Compliance Lead will liaise with government personnel and provide direction as required.

Any free product recovered will be disposed of via a special waste handling company approved by DOEC. Contaminated soil will be disposed of in consultation with DOEC/Service NL. In many areas of the province contaminated soil must be treated at a soil treatment facility prior to disposal.

Contaminated absorbent materials may be disposed of at a local landfill site, provided as much free product as possible is recovered from the absorbent materials prior to final disposal at the landfill site. The responsible party will be responsible for contacting the local landfill operator to confirm any additional requirements.

In situ burning is a response alternative that can be implemented with the approval and supervision of the DOEC/Service NL. Only Nalcor Energy will determine if in situ burning is appropriate to pursue. Nalcor's Environmental and Regulatory Compliance Lead will liaise with

government personnel and provide direction as required. In situ burning of spilled product is usually considered only when the spill has occurred in an isolated area where supplies and equipment are difficult to obtain.

11.3 Other Product Considerations

11.3.1 Glycol Spills and Leaks

Under current legislation, reporting of spills involving glycol to regulatory agencies is required. Glycol is considered a petroleum derivative and should therefore be treated as an “associated product” under the *Storage and Handling of Gasoline and Associated Products Regulations*. Reporting is required in the event of a spill or leak greater than 70 litres, or a spill or leak, regardless of the quantity, that has the potential to contaminate nearby property or enter a water body.

When handling concentrated or dilute glycol, the Contractor should always refer to the MSDS for personal protection equipment to be used during clean-up.

The general control, containment and cleanup procedures described above are applicable. Note that glycol mixtures contain varying amounts of water and absorbent materials designed for hydrocarbons will not be effective, as they repel water. Universal absorbent materials (normally grey or yellow rather than white) and rags are most effective. Universal absorbent materials absorb both product and water.

11.3.2 Battery Acid Spills and Leaks

The main component of batteries is sulphuric acid. Sulphuric acid is considered a highly corrosive material. When responding to a spill of battery acid the Contractor shall ensure that personnel wear the appropriate personal protective equipment.

A spill or leak of sulphuric acid does not require reporting to regulatory agencies. Nalcor’s Environmental and Regulatory Compliance Lead will determine if any correspondence with government agencies is required. In the event of a sulphuric acid spill or leak, the observer should address the situation and report the incident to the supervisor and EPCM Representative. The contractor will ensure the incident is documented (HMSSR can be used) and information distributed appropriately.

Small spills of battery acid should be diluted with an excess of water (a minimum of twice the amount of acid spilled) and the residual neutralized with alkali such as soda ash, lime or baking soda. Alkali should be added until all the water and acid is absorbed. For larger spills, physically contain the spill and neutralize it with alkali. The Contractor will dispose of diluted

and neutralized waste at an approved waste disposal site. The remaining battery shell can be recycled at a local recycling depot.

A.0 Activity Flowchart (Excel Format)

A.1 N/A

B.0 Attachments/Appendices

B.1 Hazardous Materials Spill Status Report (HMSSR) Form

B.2 Certified Special/Hazardous Waste Transporters

B.3 Containment/Recovery Techniques

Master Spill Response Plan

Doc. MFA-PT-MD-0000-EV-PL-0002-01
Rev.B1

Appendix B.1

Hazardous Materials Spill Status Report (HMSSR) Form

Master Spill Response Plan

Doc. MFA-PT-MD-0000-EV-PL-0002-01

Rev.B1

Hazardous Material Spill Status Report Form

Report Type: Initial <input type="radio"/> Follow-up <input type="radio"/> Final <input type="radio"/>	
Date and Time: <u> </u> / <u> </u> / <u> </u> <u> </u> SWOP Number (if applicable): dd mmm yyyy Time	
Observer (name /title): _____	Responsible Party (Contractor): _____
Reporter (name/title/telephone number): (person reporting incident to CCG)	
Reported to: Canada Coast Guard (CCG) <input type="radio"/> Time _____ Confirmed Recordable Only <input type="radio"/> (Call 772-2083 or 1-800-563-9089)	
EPCM Representative <input type="radio"/> _____ On-Site Environmental Monitor <input type="radio"/> _____ Nalcor Energy Representative <input type="radio"/> _____ Other (fire, police etc.) <input type="radio"/> _____	
Location: _____	Name of Facility/Landmark or GPS Coordinates: _____
Date and Time of Spill/Leak: <u> </u> / <u> </u> / <u> </u> <u> </u> dd mmm yyyy Time	Material Spilled/Leaked: <input type="radio"/> Gasoline <input type="radio"/> Diesel <input type="radio"/> Hydraulic Fluid <input type="radio"/> Lubricating Oil <input type="radio"/> Transformer Oil (PCB Concentration: _____) <input type="radio"/> Other (Please specify): _____
Estimate of quantity spilled/leaked (litres): 	Spill/Leak source stopped: (Yes/No) _____ (Please comment)
Source of spill/leak: 	

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<p>Weather conditions at the time of the Spill/Leak:</p> <p>Air Temperature ___ °C <input type="radio"/> Rain</p> <p>Wind Speed ___ Km/h <input type="radio"/> Snow</p> <p>Wind Direction _____ <input type="radio"/> Sunny</p> <p>Visibility (good, poor, etc)</p>	<p>Spill/Leak data:</p> <p><input type="radio"/> on land <input type="radio"/> in salt water</p> <p><input type="radio"/> in fresh water <input type="radio"/> in a building/vessel/vehicle</p> <p>Snow/ice present: (Yes/No)</p>
<p>Distance to nearest features:</p> <p>Distance from well (s): Distance from body of water:</p> <p>Distance from homes or buildings: Other (wetland, ditch etc.):</p>	
<p>Containment possible:(Yes/No) _____ (If No please comment)</p>	
<p>Other potential hazards: (Please specify)</p>	
<p>Other sensitivities: (Please specify – consider floor drains, catch basins etc.)</p>	
<p>Specific cleanup/protection measures undertaken:</p>	
<p>Further action necessary/planned (Including disposal of wastes and contaminated material):</p>	
<p>Completed by: _____ Date: _____</p>	

SKETCH OF SPILL AREA

(Site photos may also be used if available)

Appendix B.2

Certified Special/Hazardous Waste Transporters

Master Spill Response Plan

Doc. MFA-PT-MD-0000-EV-PL-0002-01

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**** UNCONTROLLED DOCUMENT - FOR INFORMATION PURPOSES ONLY ****					
Source: Department of Environment and Conservation (as of March 2012)					
Confirmation of a valid Certificate of Approval is recommended upon engaging the services of any Hazardous / Special Waste transport company.					
Company	Address	Contact	Phone	C of A	Code(s)
Atlantic Industrial Services (A Division of EnviroSystems Inc.) (Formerly Crosbies)	660 MacElmon Road, PO Box 185 Debert, Nova Scotia B0M 1G0	Paul Sanford	902-662-3358 or 902-440-1553	WMS09-06-005	6
Clean Harbors Canada Inc.	640 MacElmon Road PO Box 188 , Debert, NS, B0M 1G0	Jeffrey Johnson	902-662-3336 ext 223	WMS08-03-003	6
D.D. Transport Ltd.	5 Myer's Avenue, Clarenville, NL, A5A 1T5	Gay White	709-466-1381	WMS09-08-008	10
Eastern Equipment Limited	P.O. Box 82 Musgravetown, NL A0C 1Z0	Bruce Greening		CL-WMS08-05008	4
Enviro Clean (NFLD) Ltd., o/a Power Vac Services	155 McNamara Drive, Paradise, NL, A1L 0A3	Henry Power	709-781-3264	WMS07-06-014	9
Environmental Friends	PO Box 185, Labrador City, A2V 1K5	Vanessa Simon		LB-WMS06-02003E	4,5 & 6
Enviro Safe-Fuel Systems Limited	PO Box 272, STN B, HV-GB, A0P1E0	Ms. Dione Simms		LB-WMS06-12003B	4, 7
Exide Technologies Canada	222 Edinburg Drive Moncton, NB E1E 4C7	Tim McGuey		WMS08-011-018	10
Harold Marcus Limited	Harold Marcus Limited 15124 Longwoods Road Bothwell, ON , N0P 1C0	Ms Marcus	519-695-3734	WMS07-02004 - renewal	6
Laidlaw Carriers Bulk GP Inc.	PO Box 1669, 1179 Ridgeway Road, Woodstock, Ont. N4S 0A9	Bill Preece bpreece@contrans.ca	519-421-3300 ext. 244	WMS08-10-015	6
Midland Transport Limited	100 Midland Drive, Dieppe, NB, E1C 6X4	Jean St. Onge stonge.Jean@midlandtransport.com	506-852-2660	WMS09-05-004	10
NEWALTA Industrial Services Inc.	PO Box 16004, Stn Foxtrap, Conception Bay South, NL,	Bill Locke	902-720-2008	WMS06-09-015	1,2 & 6

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	A1X 2E2				
Pardy's Waste Management & Industrial Services Ltd.	PO Box 285 Pasadena, NL	Derek Pardy	782-2003	WMS08-05-007	4 & 5
Safety Kleen Canada Inc.	300 Woolwich Street South, Breslau, On. Canada, NOB 1M0	Andre Morin	1-800-558-5000, ext 7429	WMS07-06-013	6
Seaboard Liquid Carriers	4 Vidito Drive Dartmouth, Nova Scotia B3B 1P9	Dale MacKeigan	902-404-3007	WMS09-004-03	6
Services Sanitaires de Recyclage Expert Inc. (Former -Recyclex)	8381, place Marien, Montreal-East, PQ, H1B 5W6	Allan Desgroseillie rs	514-355- 4150/514-951- 5386	WMS07-01-002	6
Stark Oil Purification Systems Ltd.	113 Archimedes Street New Glasgow, NS B2H 2T3	Karen Gillis	(902) 755-2545 Tele	WMS09-11-020	1
Stericycle Inc	20 Galloway Street, Moncton, NB, E1H 2J4	Jean-Pierre Pepin	819-246-4516	WMS10-10-019	2 (UN3373 or UN3291UN 3249)
Transport Rollex Ltee	910 Boul,Lionel Boule Varenes, Qu, J3X 1P7	Louis LaFontaine	1-888-283-5539	WMS06-12-021 Renewal	6
Trans-Cycle Industries Inc., a subsidiary of Aevitas Inc	75 Wanless Court, Ayr, Ontario NOB 1E0	Tom Maxwell	(519) 740 1333 ext. 23	WMS09-003-001	1
Transport TFI 4 S.E.C. (Kingsway Bulk)	570 President-Kennedy route Pintendre QC G6C 1M9	Edith Pelletier	Tel: 418-834-5454 ext:264	WMS07-05-006	6
VEOLIA ES MATIERES RESIDUELLES INC.	Veolia ES Matieres Residuelles 3383, Boulevard de la Chaudiere Sainte-Foy (Quebec) G1X 4B8	Eric Paquin	417-872-8061	WMS08-10-016	6
Veolia ES Canada Industrial Services Inc	1705 3rd avenue Montreal, Quebec, H1B 5M9	Mr. David Flahaut	514-645-1045 ext 302	WMS10-12-021	6

Code(s): 1 - Polychlorinated biphenyls (PCB's); 2 - Biomedical Waste; 3 - Special / Hazardous Waste (excluding PCB's); 4 - Sewage - Liquid Waste; 5 - Waste Oil (may include other hydrocarbons); 6 - Hazardous Waste General (excluding biomedical and asbestos waste); 7 - Asbestos and Non-Hazardous Waste; 8 - Soils contaminated with heavy metals; 9 - Asbestos and Lead Waste Only.

Appendix B.3

Containment/Recovery Techniques

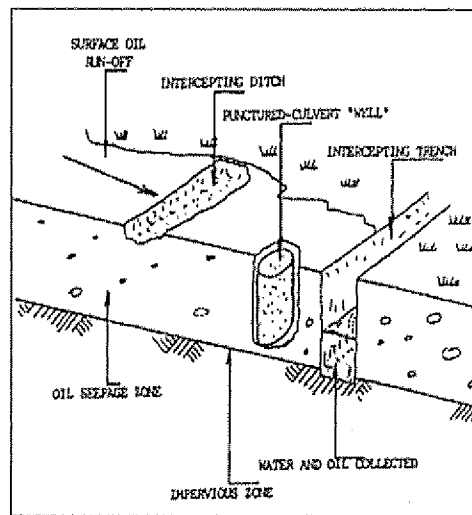
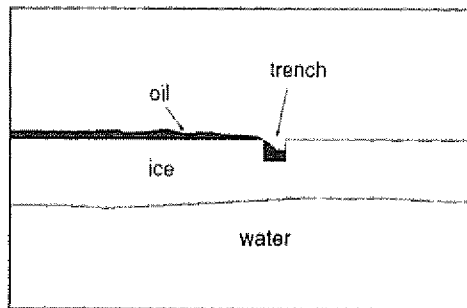
Sorbent Material

- Sorbent materials can be used to collect oil. Commercially available sorbents can be supplied as pads, rugs, blankets, rolls, sweeps, pillows or booms. Locally available materials may be appropriate on occasion, e.g., straw or peat, but usually such natural products are less effective and efficient than commercial sorbents.
- Certain types of sorbents can be cleaned and reused. This approach is not always feasible, depending on whether the sorbent supply is limited and whether the spill location is remote.

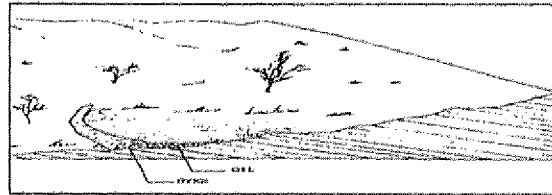


Trenches/Slots

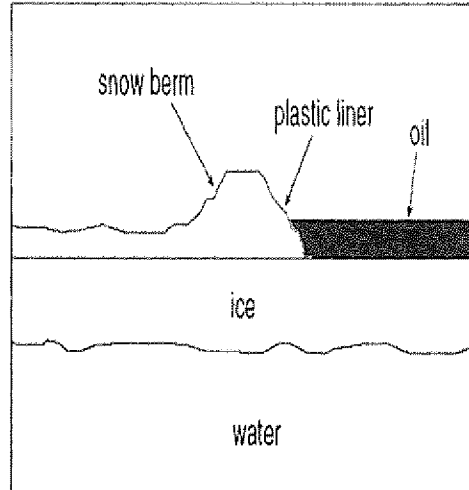
- On land, trenches or pits can be excavated to intercept, contain and collect spilled oil. On solid ice, a trench can effectively intercept, divert or collect spilled oil.



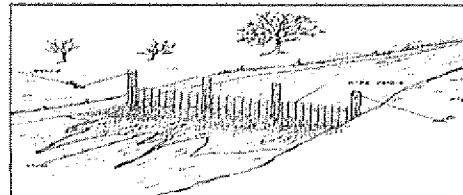
Berms



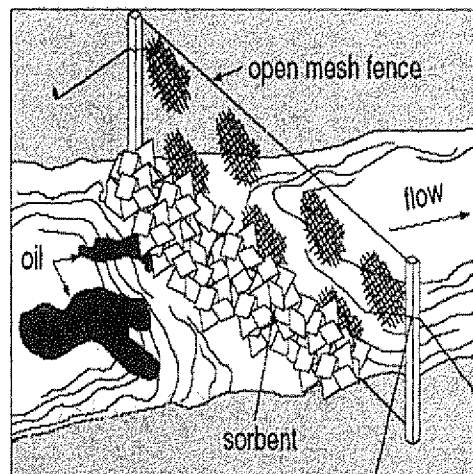
- On solid ice, surface roughness and snow act as natural barriers that limit the spread of spilled oil and may provide sufficient containment of the oil for recovery. When additional containment is required, snow can provide a quick and efficient berm construction material. For spills of diesel and light oil, a snow berm may be lined with plastic, to prevent the seepage of oil.
- Earth berms should be compacted and, if time permits, lined with plastic sheets to make them impermeable. The berm should be located sufficiently downslope of the release point to intercept the oil.



Filter Fence

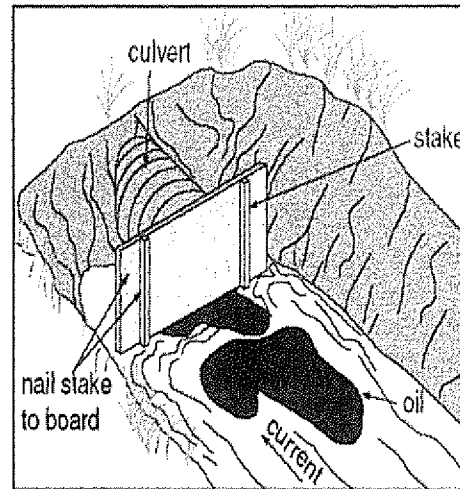
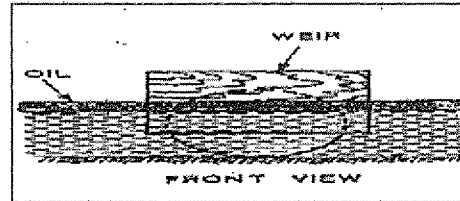


- In small, slowly-flowing rivers or streams, wire mesh or netting, anchored by stakes as a back-stop for sorbent, can control the movement of oil. A second mesh can be deployed slightly upstream of the first to act as a debris screen.
- Sorbent material can be placed between the two mesh screens. Double-fencing is particularly suitable in tidal channels where current directions reverse.



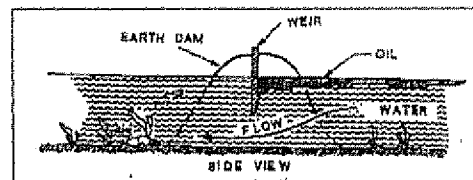
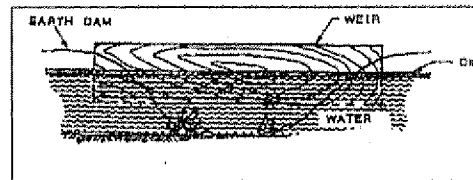
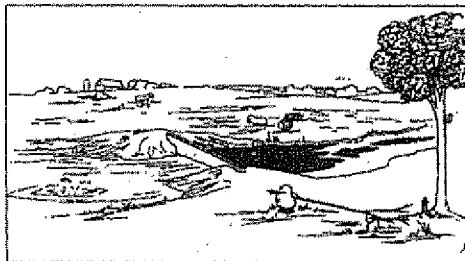
Culvert Block

- Boards or other devices can be used to halt the flow of oil in drainage systems or culverts, where the water flow must be maintained.
- The culvert opening can be partially blocked with plywood that holds back the surface oil but permits water to pass below. The position of the plywood can be adjusted vertically to maintain the water at the desired level.
- When ice is present, both oil and ice pieces can jam at the barrier making the recovery of the oil difficult.



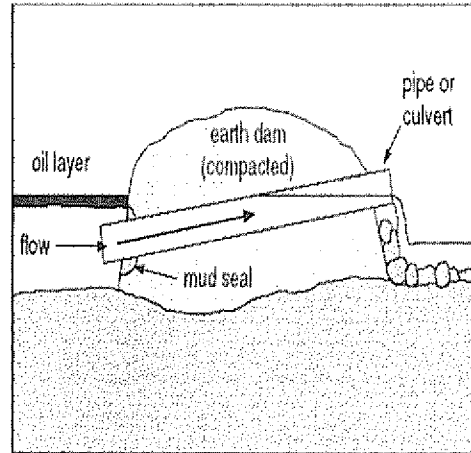
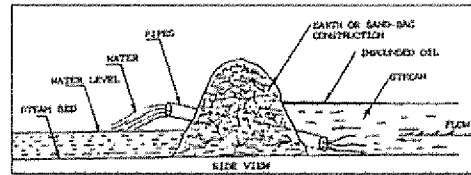
Weir

A simple weir holds back surface oil - and ice, if present - and allows water underflow. Several weirs can be quickly placed in a small stream or ditch as they are relatively easy to install using plywood or a board. The sides should be cut well into the banks, otherwise oil can escape around the ends.



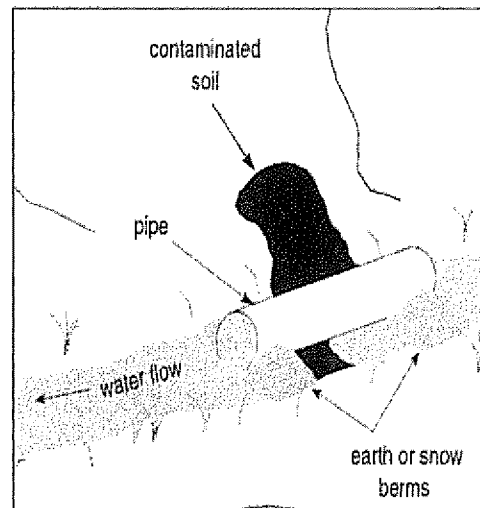
Inverted Weir

- Inverted weirs can be used to retain oil and allow the continuous flow of water in a small river or stream.
- One or more pipes are placed at an angle through a soil or sandbag dam, with the upstream end of the pipe being close to the bottom of the ditch or stream, and the downstream end at a level that permits water to drain away.
- Barriers can be constructed from snow, earth or boulders, although if large cobbles or boulders are used, plastic sheets or packed mud should be added to ensure that a good seal is made.



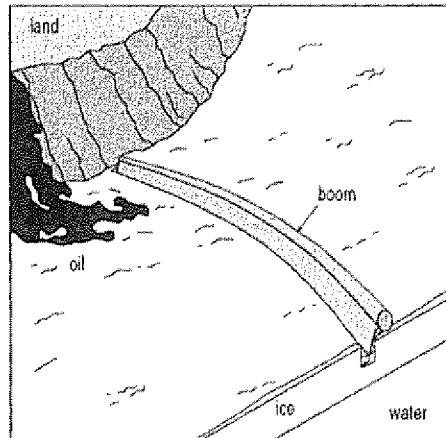
Flume

- When a slick or contaminated soil threatens a small river or creek, a flume can be built to contain the oil, while allowing the water flow to be maintained.
- Snow or earth berms should be positioned to allow a sufficiently-large containment area within the constraints of the pipe length used.
- The berms should be compacted to ensure a good seal is made with the pipe or culvert to avoid seepage. It is possible to protect a stream using a flume in broken ice conditions if water flow is maintained.



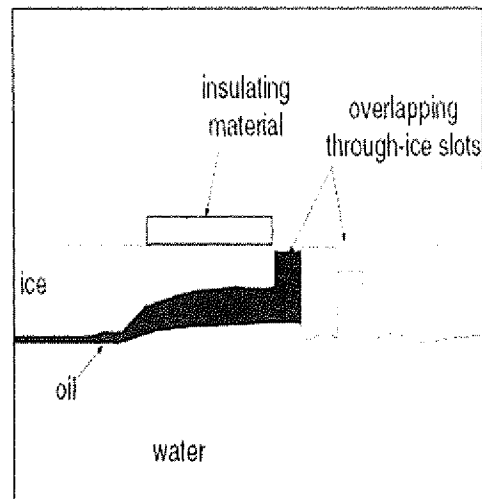
Boom/Ice Trench

- A containment or sorbent boom can be placed in a trench and frozen in place to create a barrier to divert or halt the spread of oil during winter conditions or spring melts.



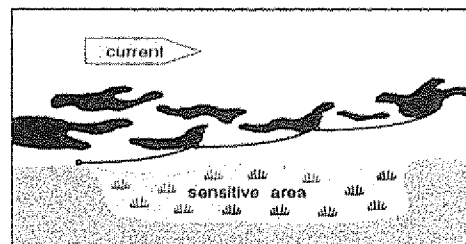
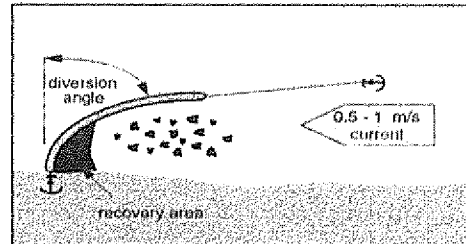
Ice Slots

- Naturally-occurring subsurface depressions and pockets under the ice provide areas where oil can accumulate. Ice slots can also be cut in the ice using an ice auger or chain saw, allowing the oil to pool at the surface and be recovered or burned.
- The slots can be lined with oil-impermeable plastic when used for recovery. Placing an insulating material, such as snow or foam, on a growing ice sheet creates a pocket beneath the ice where oil can collect.



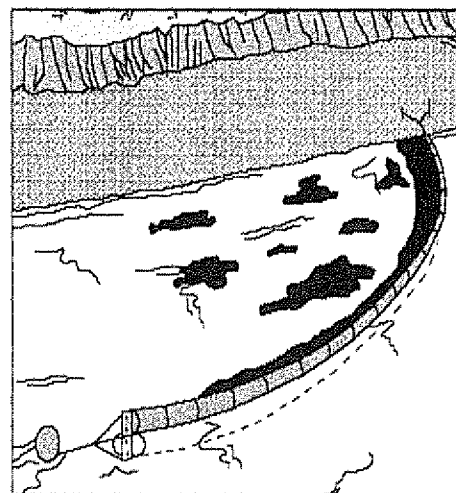
Diversion Booming

- When placed at an angle to the slick travel, containment or sorbent booms can be used to divert oil away from sensitive areas or toward sacrificial areas for collection and recovery. This method is useful in currents of up to approximately 1 m/s.
- Typically, in fast moving currents, or where the area requiring protection is extensive, a number of cascading booms are required to divert the oil.



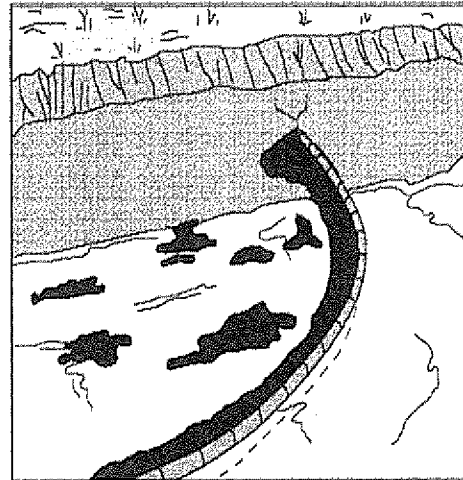
River Boom

- When current speeds exceed 0.4 m/s, it is necessary to angle a boom to reduce the current relative to the boom. Angling the boom also allows oil to be diverted to shore where it can be collected.
- In a large, coastal river with reversing tides, repositioning a boom can be difficult and time consuming.
- The deployment of booms in rivers when broken ice is present is also of questionable value, because debris or ice can damage the boom fabric.



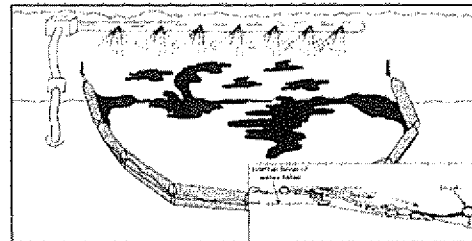
Booming in intertidal or river bank areas

- In intertidal areas, or at river banks where water levels fluctuate during the period of deployment, the boom can be sealed at the shoreline to ensure that an effective seal is maintained at the waterline.
- Sites with boulders, sharp protrusions, rip-rap or other features that will result in oil leaking under the boom when the tide changes should be avoided.
- Shore-sealing booms require regular monitoring once deployed since currents, wind and waves can move and/or twist them.



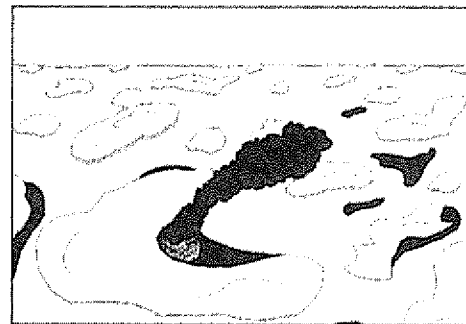
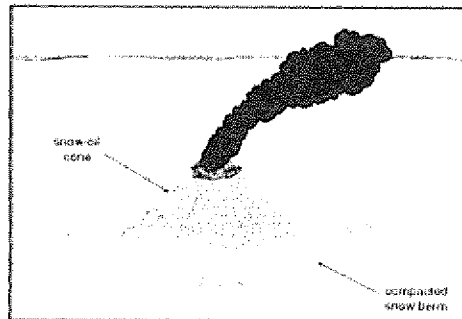
Shorline Flushing

- The objective of flushing (or washing) is to remove oil from the shore using water and to recover the oil for disposal.
- Such a technique requires a number of separate operational steps that usually include washing, containment and recovery or collection of displaced oil for disposal.
- Oil may be flushed onto the adjacent water where it can be contained by booms and collected for recovery, or the oil can be diverted to a collection area, such as a lined sump or trench, where it can be recovered.



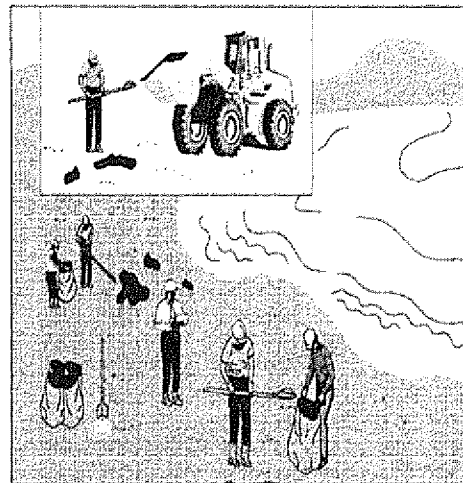
In Situ Burning

- In situ burning is possible response alternative which may be considered when the spill has occurred in an isolated area where supplies and equipment are difficult to obtain. It is relatively quick and inexpensive, but the actual amount of spilled product recovered is difficult to determine. Such a measure should only be implemented with the approval and supervision of Regulatory agencies.



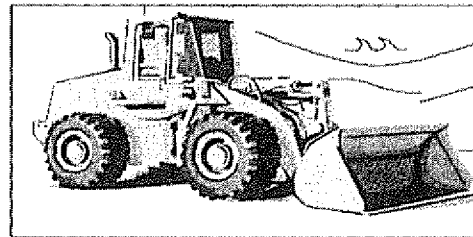
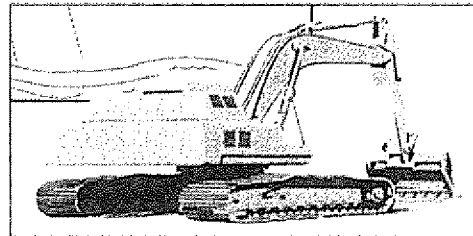
Manual Removal

- Manual removal involves personnel picking up oil, oiled sediments or oily debris with gloved hands, rakes, forks, trowels, shovels, sorbent materials or buckets.
- Oiled materials can be placed directly in plastic bags, drums or other containers for transfer. If the containers are to be carried to a temporary storage area, they should not weigh more than what can be carried by one person easily and safely. To avoid spillage, containers should not be overfilled.



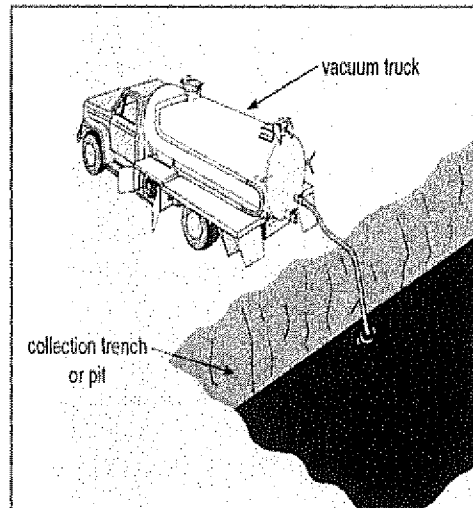
Mechanical Removal

- Mechanical techniques essentially use equipment designed for earth-moving or construction projects, although a few commercial devices have been fabricated specifically for spill cleanup applications.
- Mechanical removal is more rapid than manual removal but generates larger quantities of waste.



Mechanical Removal

- Vacuum trucks are effective when access to pooled oil is possible, but they are large, heavy, expensive and typically limited to lifting fluids to heights of 10 m or less.
- Vacuum trucks pick up a high ratio of water to oil when used on thin slicks.
- They are commonly used to recover oil in ice but can sometimes lose suction when lines freeze and ice pieces clog the hose inlet.



Nalcor Energy – Lower Churchill Project



Security Management Plan

LCP-PT-MD-0000-HS-PL-0005-01

Comments:	Total # of Pages (Including Cover): 30
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Status/ Revision	Date	Reason For Issue	Prepared By	Checked By:	Project Manager (Marine Crossings) Approval	Project Manager (Generation + Island Link) Approval	Project Director Approval
B1	27-Feb-2013	Issue for Use	D. Riffe	S. Lee	G. Fleming	R. Power	P. Harrington
A1	25 Sept 12	Issue for Review	D. Riffe				
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Inter-Departmental / Discipline Approval (where required)

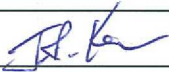
Department	Department Manager Approval	Date
Deputy General Manager		
	J. Kean	
Muskrat Falls Site Manager		
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	Name	
	Name	

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1.0 Purpose

This Security Management Plan will define the methods used to determine the level of threats and security preparedness required to effectively address these identified threats at all construction sites for the Lower Churchill Project (hereafter referred to as LCP or the Project). The operational basis of this plan has been developed in accordance with information generated from an initial project threat assessment conducted by an independent third party consultant in December of 2011.

The physical environment of infrastructure of the Muskrat Falls construction camp and support systems will be designed and managed to reduce the potential of security related incidents/unwanted events. A risk assessment has been conducted to define those areas or zones where the security threats are and how these can be adequately mitigated any known or perceived risk. The Security Management Plan must remain an “evergreen” document to allow for changes in focus, site conditions, threats/risks and mitigating actions. Any changes to this document will be forwarded to all responsible individuals via document processing/document control/Aconex. The Security Management Plan is an integral component of the overall LCP Security Management strategy.

2.0 Scope

The scope of the LCP Security Management Plan consists of the following construction work sites and auxiliary support sites to be effectively managed from a Security perspective:

- Muskrat Falls Generation Facility
- Labrador Island Transmission Link (LITL)
- Labrador Transmission Asset (LTA)
- Miscellaneous Lay Down Areas
- Project Office (s)- Torbay Road/Hydro Place/Happy Valley-Goose Bay Office

Refer to **Attachment #1** for the LCP Project Schematic for additional information.

Other areas that have been considered and included in this plan, as and when applicable, are:

- Public access buildings

-
- Marine ports

3.0 Definitions

Access Control System - A system having several features which enable a designated authority to control access to physical areas or information and resources within a given facility. This often consists of physical barriers (static and automated) and access interfaced to a computer-based information system.

Authorized Worker – Any worker who has fully met all training and testing requirements stipulated by the NALCOR / SLI and deemed to be fully competent to work within his/her defined work scope on the project. Additionally, this definition shall include those individuals who, over time, remain in good standing with all training and site access requirements.

Authorized Escort – A contractor or subcontractor representative who has completed site orientation, is fully aware of the site's emergency response and evacuation procedures, and has the authority to accompany visitors.

EPCM – Engineering, Procurement, and Construction Management Consultant- Refers to a contracted company providing technical support services under the direction and management of Nalcor. For the Lower Churchill Project the EPCM Consultant is SNC-Lavalin.

Host – A contractor or subcontractor representative who has been authorized to invite non-project personnel to the project site and receives prior clearance from the Muskrat Falls Site Management or Transmission Line Management beforehand.

Visitor – Any non-project person(s) visiting the project construction site including, but not be limited to vendors, couriers, delivery personnel, regulatory personnel, consultants, engineering representatives, stakeholders and other personnel not assigned to the site.

Badges – Purpose-specific credentials or devices which identify the bearer by electronic signature and photographic confirmation of the bearer. Badges also act as an access tool that interface with a computer based system which activates gates, turnstiles or other physical barriers designed to restrict access.

Temporary Badges – A temporary credential issued to individuals who have been authorized to access the LCP on a limited or temporary basis. Temporary badges are intended to be used in conjunction with Authorized Escorts, and shall be returned to security when visit is completed and/or permanent badge is issued.

Qualified and Competent Security Personnel – Security personnel who, as a minimum, have met all work scope criteria and job stipulations and successfully completed a nationally or provincially recognized security training, supplemented by a minimum of 2 years security work experience in a construction type environment.

4.0 Responsibilities

4.1 Project Component Manager(s)

The Project Component Manager(s) shall ensure all Contractors are fully informed of the security stipulations and requirements defined within this plan, as well as any changes or modifications made to the plan during the course of the Project. Additionally, the Project Component Manager(s) shall ensure all necessary resources; personnel and training, etc. are provided to adequately meet the requirements as defined by this Plan.

4.2 LCP Project Health and Safety Manager

The LCP Project Health and Safety Manager shall be responsible for the overall implementation and management of this Project Security Management Plan. The LCP Project Health and Safety Manager for will also provide oversight and on-going management through direct interface with:

- EPCM Health and Safety Personnel
- Muskrat Falls Site Manager and Site Management Team
- LCP Component Managers
- Telecommunications
- Security Service Provider
- Nalcor Corporate Management Team
- SOBI Crossing Project Manager/Project Team

The SOBI Crossing Project Manager and SOBI Health and Safety Advisor shall be accountable for ensuring that Management of Security is implemented and maintained for the SOBI operations/activities. The Contractor's responsibility for Site/Vessel Security will be clearly defined contractual agreements and verified by the SOBI Health and Safety Advisor.

4.3 Muskrat Falls Site Health and Safety Manager; Site Health and Safety Coordinator/Advisor

The Muskrat Falls Site Health and Safety Manager and Site Health and Safety Coordinator shall also coordinate and consult on incident investigations, secure required documentation and facilitate, through the security contractor, the site badging and induction process for all contractor and subcontractor personnel entering the project site. The Site Health and Safety Coordinator shall also collect and report all metrics and documentation as established by the Muskrat Falls Site Manager and LCP Health and Safety Manager

The Site Health and Safety Manager shall liaise with all Contractor supervision to address issues that arise concerning the security of LCP, tools and equipment.

For SOBI Operations, The SOBI Health and Safety Advisor shall monitor and observe the implementation and maintenance of Security Practices and Principles on SOBI Sites and Contracted Vessels during the execution of the scope of work.

4.4 Field Emergency Response and Security Coordinator

The Site Emergency Response and Security Coordinator shall:

- Supervise and serve as the primary day-to-day point of contact for the Security services provider in relation to establishing processes and systems needed to adequately secure the project site. Ensure the full implementation, enforcement and general application of the Security Management Plan.
- Reviews and recommends (for approval) any request for resources by Security Provider.
- Functions as the key point of contact for the Security Provider. Additionally, this position oversees and monitors the third party Security Provider to ensure all requirements and commitments outlined in the written contract are adhered to and/or effectively executed.
- Conduct periodic site inspections from a site security perspective,
- Prepare loss and incident reports and liaise with subcontractor supervision in relation to property losses and./or investigations and ensure all personnel under their authority fully comply with all provisions and stipulations within the Security Management Plan.

-
- Monitor the plan's performance and assess the security contractor on a regular basis to ensure suitability and overall effectiveness.
 - Identify areas that require further threat assessment as the project develops and/or changes. This shall include a security assessment for marine ports and the transmission line construction areas, as and when required.
 - Coordinate and assist, as required, local law enforcement in the investigation, collection of evidence and resolution of criminal activity on the LCP Construction Site.
 - Participate in all supervisory safety meetings and report all required security metrics and data to the Site Health and Safety Coordinator for correlation and report to the Muskrat Falls Site Manager. The security coordinator must be responsive to project management to report on relevant security issues as required.

4.5 Contractor Security Personnel

Qualified and competent Security personnel will be responsive to the needs and requirements as outlined in the "**Authorization Protocol for Access to Project Construction Sites (LCP-PT-MD-0000-HS-PR-0001-01)**", as well as the directions of the Security and Emergency Response Coordinator and Site Health and Safety Manager. Security Officers will visually check all worker's ID presented for access to the Muskrat Falls jobsite and resolve any discrepancies before the badge bearer is permitted entry into the project site. Security officers will continue to monitor the workforce through the audit process to ensure that all personnel on site have the appropriate level of access prior to entry.

A security gate will be positioned at the entrance to the forestry access road from the Trans-Labrador Highway. During active construction, the gate will be manned on a 24 hours per day, 7 days per week. Initially, a temporary facility will be installed at the location (small trailer with generator to provide power, washroom facilities, cellular and satellite phone as well as VHF radio with the clearing and road construction contractors' frequencies). A list of personnel and vehicles involved with the road clearing and construction will be provided to the security personnel for site access. All vehicles approaching the entrance to the gate will be checked to ensure that the personnel and vehicles are authorized to enter. The lift gate can be left open when there are security personnel at the control position. The gate will be closed and locked when security personnel are not present at the control position.

The purpose of the security presence at this gate is to limit/control access to Muskrat Falls site. The following risks have been identified as Moderate to High level Risks.:

- Transportation of illegal contraband (drugs and alcohol) to/or from the construction site, which could have an adverse impact on personnel and activities. Impacts may include equipment damage, vehicle accidents and personnel injury. (Risk: Moderate)
- Theft/unauthorized transport of contractor/contractor property from the construction site. Impacts may include project delays, as well as financial impacts to contractor/company. (Risk: Moderate)
- Unauthorized access of on-lookers/curiosity seekers onto the site. Impacts may include endangerment of site personnel and/or unauthorized personnel due to the inherent dangers of the work activity combined with the distractions that may be caused by unauthorized personnel, as well as increased risk of unauthorized vehicles impacting construction site transportation patterns which could result in vehicle accidents and potential liability for Nalcor. Although the site will be sign posted advising all personnel that it is company premises and authorization is not allowed, access via snowmobiles, four wheelers, etc. is quite possible. (Risk: Moderate)
- Unauthorized demonstrations/protestors at the site entrance. Impacts may include hampered access, work stoppage and potential sabotage incidents endangering personnel, equipment which could result in work delay and/or work stoppage. (Risk: Major)

As a result of the aforementioned risks, the following protocols will be instituted:

- A Security Guard Station will be constructed a safe distance from the Trans-Labrador highway so as not to impede routine traffic on the highway at any time. Provisions will be made to direct oncoming traffic to a staging area (along the side of the access road) in the event of high traffic volume.
- The Security Guard Station will have a full time lockable gate to control access and will be manned by two Site Security Personnel at all times. One of the guards will be checking documentation and authorizations for site entry, while the other guard will be unlocking the gate, checking the vehicle for contraband or suspicious behaviour.
- The Security Guard Station will be manned and operational on a full time (24 hour) basis.

-
- If a security guard suspects an individual(s) to be transporting illegal contraband to the site or demonstrating irregular behaviour, the guard should contact the Muskrat Falls Site Manager to advise the situation and detain the individual until contact is made. Any personnel found to be transporting illegal contraband or demonstrating irregular behaviour will be asked to leave the site immediately and will not be allowed to return to the site.
 - If the Security Guard suspects and unauthorized removal of equipment/property has taken place, he must advise the Muskrat Falls Site Manager and have him address the issue with the individual in question.
 - In the event that unauthorized personnel are found to be trespassing on the site, they will be asked to leave immediately. In the event they refuse to leave, the RCMP will be contacted by Security to remove these personnel from the site.

In the case that members of the public arrive at the security gate with questions related to the road construction they will be politely directed to contact the Happy Valley/Goose Bay Nalcor Office. In the event protestors/demonstrators are at the site entrance or on the site. Site Security will notify the Muskrat Falls Site Manager and advise him of the situation. The Muskrat Falls Site Manager will contact the RCMP, particularly if the situation escalates. If protestor/ demonstrator actions are inhibiting work activity, Nalcor operations may be shut down and Nalcor Project Management (through the Muskrat Falls Site Manager) may elect to file an injunction to have these personnel removed from the site, which would be private property.

The project office located at the Muskrat Falls Construction Site Area is currently only accessible to authorized project personnel though the main gate clear security. All visitors to the site are required to complete a "Remote Site Access Request Form, which must be approved by the Muskrat Falls Site Manager, the LCP Safety and Health Manager, as well as the Project Manager. Refer to Section 11 of this document for more information pertaining to Visitor Access. Once access is gained into the site, the electronic swiping process is further supplemented by a sign in/sign out requirement at the main gate. Visitors cannot enter the site until Site Security verifies the visit has been pre-approved as per the Remote Site Access Procedure. As per the visitor policy, visitors are required to sign in and sign out at the main gate and are to remain in the Main Gate Area until the appropriate project person arrives to meet the visitor. Visitors are to be escorted full time by the respective project representative for the duration of the visit to the office.

Security personnel will be involved as a key point of contact in emergency response activities, journey management and other general communications on site 24 hours per

day / 7 days a week. Additionally, security officers will be required to conduct the following:

- Periodic site inspections of the jobsite to determine if the perimeter is secure,
- Periodic inspections of all bags and packages entering the worksite;
- Periodic examination of all lunchboxes and personal packages leaving the Muskrat Falls site;
- Inspection of camp rooms as a result of reasonable suspicion (as defined under the Muskrat Falls Camp Rules) for drug and/or alcohol use.
- Inspections of all vehicles entering and leaving the Muskrat Falls site;
- Oversight and enforcement of site speed limits and conduct regular checks of their assigned area for security violations or activities of a suspicious or undesirable nature and report them to the Security Supervisor.
- Security officers shall also assist in all incident investigations, as required, relevant to health and safety observations and associated security matters.

For sites other than Muskrat Falls, Site Contractors may be required to provide Security Officers responsible for carrying out security duties. The Security Officers will be responsible for interfacing with contractors and assisting, as required, on supporting contractor's security plan. Coordination of joint security planning with contractors will require the overall communication and coordination with the site Health and Safety Coordinator for this scope of work. Should gated facilities be erected at Sub Station construction sites, security officers will be responsible for controlling and managing access and egress from these sites

4.6 Contract Workers, Visitors and Other Personnel

All workers, visitors and other personnel having reason to physically enter the Muskrat Falls site shall adhere to the requirements of this plan by attending all required training, providing required personal information, submitting to applicable drug and alcohol testing protocols and inspection, and meeting all other requirements as defined under the plan.

5.0 Security Threat Assessment

The level of security protection will vary for each area of the LCP based on risk exposure and probability of incident occurrence.

A Security Threat Assessment is the process that is used to determine the security threat (s) to the project, and is in line with the risk assessment process. The Threat

Assessments noted below utilize the LCP Risk Matrix for evaluating security related threats: The security threat assessment is normally used in areas such as:

Muskrat Falls Generation Site (North Spur and South side) Security Threats may include the following:

- Unauthorized entry into the site; **(Risk- Moderate)**
- NGO Protest Groups blocking site access (materials, equipment, personnel, emergency access); **(Risk- Major)**
- Theft of computers, proprietary information, equipment, supplies, fuel, materials- including explosive or flammable materials, tools; **(Risk- Moderate)**
- Vandalism of company or contractor property, structures, equipment, materials; **(Risk- Moderate)**
- Sabatoge of company/contractor equipment, materials, supplies, fuel; **(Risk- Moderate)**
- Bomb threat event at the construction site or accomodations. **(Risk- Moderate)**
- Emergency evacuation of the site (due to wild fire, flooding, hazardous weather conditions or other unforeseen weather related and natural disaster event) leaving equipment, materials, computers, etc. exposed for theft. **(Risk- Moderate)**
- Hunting/trapping on designated company property endangering site personnel; **(Risk-Moderate)**
- Unauthorized personnel at site locations while hazardous operations/tasks are underway (blasting, heavy lifts, excavation/trenching, loading, heavy equipment operations, high voltage work activities). **(Risk-Moderate)**
- Personnel operating equipment/vehicles or working on site while under the influence of alcohol or drugs. **(Risk-Moderate)**
- Driving on site at unsafe speeds, without seatbelts, while using cell phones or in an otherwise wreckless manner. **(Risk-Moderate)**
- Violence at the site/camp (fighting, weapons, firearms, other violent behaviour/action) **(Risk-Moderate)**

Soldier's Pond and Churchill Falls Security Threats may include the following:

- Unauthorized entry into the site; **(Risk- Moderate)**
- Protest/aboriginal groups blocking site access (materials, equipment, personnel, emergency access); **(Risk- Moderate)**
- Theft of computers, proprietary information, equipment, supplies. **(Risk- Minor)**
- Vandalism of company or contractor property, structures, equipment, materials; **(Risk- Moderate)**
- Sabatoge of company/contractor equipment, materials, supplies, fuel; **(Risk- Minor)**
- Bomb threat event at the construction site or accomodations. **(Risk-Minor)**
- Emergency evacuation of the site (due to wild fire, flooding, hazardous weather conditions or other unforeseen weather related and natural disaster event) leaving equipment, materials, computers, etc. exposed for theft. **(Risk-Moderate)**
- Hunting/trapping on designated company property endangering personnel working on site; **(Risk-Moderate)**
- Unauthorized personnel at site locations while hazardous operations/tasks are underway (heavy lifts, high voltage work activities). **(Risk-Moderate)**
- Personnel operating equipment/vehicles or working on site while under the influence of alcohol or drugs. **(Risk-Moderate)**
- Driving on site at unsafe speeds, without seatbelts, while using cell phones or in an otherwise wreckless manner. **(Risk-Moderate)**
- Violence at the site (fighting, weapons, firearms, domestic violence). **(Risk-Minor)**

Security Threats for **Transmission Lines** may include the following:

- Unauthorized entry into the transmission line temporary site; **(Risk-Moderate)**
- Protest/aboriginal groups blocking site access (materials, equipment, personnel, emergency access); **(Risk-Moderate)**

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- Theft of computers, proprietary information, equipment, supplies, fuel, materials- including flammable materials, tools; **(Risk-Moderate)**
 - Vandalism of company or contractor property, structures, equipment, materials; **(Risk-Moderate)**
 - Sabatoge of company/contractor equipment, materials, supplies, fuel; **(Risk-Moderate)**
 - Bomb threat event at the temporary site or accomodations. **(Risk-Moderate)**
 - Emergency evacation of the site (due to wild fire, flooding, hazardous weather conditions or other unforeseen weather related and natural disaster event) leaving equipment, materials, computers, etc. exposed for theft. **(Risk-Moderate)**
 - Hunting/trapping on designated company property endangering site personnel; **(Risk- Moderate)**
 - Unauthorized personnel at site locations while hazardous operations/tasks are underway (heavy lifts, loading, heavy equipment operations, high voltage work activities). **(Risk-Moderate)**
 - Persons camping on the Right-Of-Way. **(Risk-Moderate)**
 - Personnel operating equipment/vehicles or working on site while under the influence of alcohol or drugs. **(Risk- Moderate)**
 - Driving on site at unsafe speeds, without seatbelts, while using cell phones or in an otherwise wreckless manner. **(Risk-Moderate)**
 - Violence at the site/camp (fighting, weapons, firearms, other violent behavior/action.) **(Risk- Minor)**

Security Threats for **Marshalling Yards** may include the following:

- Theft of equipment, supplies, fuel, materials- including explosive or flammable materials, tools; **(Risk- Major)**
- Unauthorized entry into the site; **(Risk-Moderate)**
- Protest/aboriginal groups blocking site access (materials, equipment, personnel); **(Risk-Moderate)**
- Vandalism of company or contractor property, equipment, materials; **(Risk-Moderate)**

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- Sabotage of company/contractor equipment, materials, supplies, fuel; **(Risk-Moderate)**
 - Emergency evacuation of the site (due to wild fire, flooding, hazardous weather conditions or other unforeseen weather related and natural disaster event) leaving equipment, materials, etc. exposed for theft and/or damage. **(Risk-Minor)**
 - Unauthorized personnel at site locations while hazardous operations/tasks are underway (heavy lifts, loading, heavy equipment operations). **(Risk-Minor)**
 - Personnel operating equipment/vehicles or working on site while under the influence of alcohol or drugs. **(Risk-Moderate)**

Security Threats for the two **Electrode Sites** may include the following:

- Unauthorized entry into the site. **(Risk-Moderate)**
- Theft of equipment, materials (primarily copper). **(Risk-Moderate)**
- Individuals going into the water (without authorization) **(Risk-Minor)**
- Sabotage of any accessible equipment, supplies, materials on site. **(Risk-Moderate)**

Security Threats for the **Transition Compounds** may include the following:

- Unauthorized entry into the compound. **(Risk-Moderate)**
- Theft of equipment, materials. **(Risk-Moderate)**
- Sabotage of any switchgear, connections, etc. at the site. **(Risk-Moderate)**
- Unauthorized operation or tampering of switchgear, connections, etc. at the compound. **(Risk-Moderate)**
- Vandalism of any equipment or materials within the compound. **(Risk-Moderate)**
- Unauthorized personnel at site locations while hazardous operations/tasks are underway (hook-up, commissioning and energization) **(Risk-Moderate)**

Security Threats for **Laydown Areas** include the following:

- Unauthorized entry onto the laydown areas **(Risk-Moderate)**

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- Theft of equipment, supplies, materials, tools. **(Risk-Moderate)**
 - Vandalism of company property, equipment, materials. **(Risk-Moderate)**
 - Sabatoge of company equipment, materials, supplies stored in the laydown areas. **(Risk-Moderate)**
 - Unauthorized entry into the site while hazardous operations/tasks are underway. **(Risk- Minor)**
 - Personnel operating equipment/vehicles or working in the laydown area while under the influence of alcohol or drugs. **(Risk-Moderate)**
 - Driving on in the laydown area at unsafe speeds, without seatbelts, while using cell phones or in an otherwise wreckless manner. **(Risk-Moderate)**

Security Threats for the **Project Offices (Happy Valley/Goose Bay and Torbay Road Office)** include the following:

- Unauthorized entry into the Project Offices. **(Risk-Moderate)**
- NGO Protest Groups blocking office access (proprietary information/reference materials/documentation/reference materials, equipment, personnel, emergency access, Emergency Operations Centre); **(Risk-Moderate)**
- Theft of equipment, supplies, computers, printers, proprietary information **(Risk-Moderate)**
- Vandalism/Sabatoge of company or contractor property, structures, equipment, materials; **(Risk-Minor)**
- Bomb threat event at the Project Office. **(Risk-Moderate)**
- Emergency evacuation of the Office(due to fire, flooding, hazardous weather conditions or other unforeseen weather related and natural disaster event) leaving equipment, materials, computers, etc. exposed for theft. **(Risk-Moderate)**
- Violence at the office (fighting, weapons, firearms, other violent behaviour/action) **(Risk-Minor)**

Other areas that may be included in this plan are:

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- **Public access buildings** (Security Treats may include theft, vandalism, sabotage, NGO Protests) **(Risk-Moderate)**
 - **Marine ports** (Security Treats may include theft, vandalism, sabotage, NGO Protests) **(Risk-Moderate)**
 - **Highways** (Security Threats may include blockades by NGO Protest Groups, significant weather conditions or serious vehicle incidents limiting or prohibiting site access, emergency response) **(Risk-Moderate)**
 - **Airports** (Security Threats may include serious aircraft (fixed wing or helicopter) incidents adversely impacting company personnel and site operations). **(Risk-Moderate)**

In general terms, it can be expected that periodic disruptions from the NGO's at or near the construction site gates will occur. The scope and depth of any civil disobedience on their behalf will vary depending on personnel involved, but it is believed that this threat potential will exist throughout the duration of the project and could have an adverse impact upon construction deadlines, occupational health and safety issues and community support and relationships.

Many of the proponents have expressed concern that illegal organized criminal activity will flourish in the community. There are some indications that some organized criminal groups are making efforts to entrench themselves in the community. As a result, there will likely be an increase in the distribution, sale and use of illegal drugs, the primary focus being the construction workforce which will reach 1500 at peak stages of the project. Ongoing police intelligence indicates that there is a significant amount of hard drugs, i.e., cocaine, crack cocaine, coming into the area from Montreal and Toronto. This will have a knock-off effect and potential impact upon health and safety at the camp and worksites. As a result, the **LCP Drug and Alcohol Standard (LCP-PT-MD-0000-LR-SD-0001-01)** has been approved and in place for LCP Construction Sites, to mitigate risk. Drug and Alcohol testing will be carried out for pre-access and post incidents. Additionally all personnel are requested to be vigilant – i.e, drug and alcohol pre-access and post incident testing, as well as vigilant monitoring of personnel to identify unusual or abnormal behaviour.

A network of information has been established and intelligence will flow as the project moves forward. A continual scan of conditions in the area under the auspices of a proactive intelligence gathering mechanism will be required.

Future Project security threat assessments shall be conducted periodically using a competent individual with a recognized security background to ensure potential threats and mitigating actions are undertaken, as appropriate.

6.0 Security Methodology/Approach

6.1 Muskrat Falls Generation Site

The Security Contractor's Execution Plan addresses site security methodology and approach and should be referred to for additional detail on methodology and approach. In general terms, Site Security Methodology and Approach are defined in the following sections.

6.1.1 24 Hour Patrols

Contractor employed security personnel will undertake 24 hour / 7 days a week security patrols of the site, with particular focus on conducting such patrols after normal working hours. Such patrols will be conducted by 2 person teams that will visually inspect areas containing equipment and materials, and those site support areas susceptible to unauthorized entry. Security personnel will report any unauthorized entries and persons demonstrating suspicious behaviour to project management utilizing the project reporting protocol. Additionally, Security personnel will be monitoring vehicle speed and driving activity and reporting any violations to the Emergency Response and Security Coordinator for handling..

6.1.2 Site Access and Random Checks

All authorized site personnel and contractors will be issued a readable identification badge which is scanned at the entry gate by site security upon entry and exit from the site. Personnel entering the site via bus or van will also be required to have their identification badges scanned prior to entry and exit from the site. The identification badge will allow for an accurate accounting of all personnel on the Muskrat Falls site at any given time during the day or night. Personnel arriving at the site without their badge may be issued a temporary identification badge after presenting appropriate identification. The temporary badge must be returned to security upon leaving the site.

On a random basis, security checks of personnel entering and leaving the site will be conducted by the Security Contractor. Individuals who possess an unauthorized badge;

or no badge, shall be denied access to the Muskrat Falls site. An unauthorized badge may include, but is not limited to the following:

- Photograph of bearer does not match the individual trying to gain site access.
- Scan indicates expired training and/or other credentials
- Attempted access by authorized person at wrong gate
- Unauthorized contractor to the LCP
- Other circumstances- to be determined

Random checks of vehicles, knapsacks, plastic bags, luggage, tool boxes, lunch boxes, and other containers will be completed to verify that personnel are in possession of only personal property. All materials, tools or equipment may also be checked by security personnel. Submission to random security checks are a condition of employment on the LCP.

Reasonable suspicion of security breaches may lead to a search of an individual's site accommodations, breaches may include, but not limited to, the following:

- Theft
- Property Damage
- Suspicion of Drugs and Alcohol Possession or use/intoxication/impairment.

6.1.3 Signage

The following signage shall be posted in and around the entrances to each site:

"No Trespassing" signs, installed at all perimeter access points.

- Signs having a 24 hour emergency phone number for a person who can respond to the site. It should also be posted at each of the on-site trailers and camp facilities.
- All Signs must be posted a minimum of five feet off the ground level to prevent vandalism, sabotage or theft.

6.1.4 Video Surveillance

Video Surveillance equipment will be strategically placed on the Muskrat Fall Generation site to continuously monitor site access points and other key areas that require continuous visual monitoring. These areas will include, but not limited to, parking areas, exterior and interior of camp facilities, and areas that contain high value equipment. Video monitoring and surveillance will be overseen and managed by contractor security personnel.

At the Accommodations Complex, twelve security cameras will be located in and around the Accommodations Complex. In addition to the security cameras, extra wiring will be provided throughout the Complex buildings area to allow for quick installation of additional security cameras as the situation dictates during occupancy. The twelve cameras noted will be located in the following areas:

- Two exterior and one interior cameras will be located in the Accommodations Complex Security Building;
- One camera will be mounted on a light standard at the Emergency Power/Fuel Storage Area;
- Two cameras will be mounted on light standards (One on north side and one on the south side of the vehicle parking area near the Accommodations Complex;
- One camera will be mounted on a light standard (along the east side) for the Bus Depot;
- One interior camera will be located in the Communications Building;
- One exterior camera will be located in the main entrance of the Accommodations Core Complex;
- One exterior camera will be located in the Transit Waiting Area of the Accommodations Core Complex;
- One interior camera will be located in the Receiving and Shipping Area of the Accommodations Core Complex;
- One interior camera will be located in the warehouse area of the Accommodations Core Complex.

(Note: These cameras will be monitored at the Main Security Building at the Accommodation Core Complex)

In addition to the above, the following exterior cameras will be located at the Security Gate near the Trans-Labrador Highway:

- Two exterior and one interior camera will be located at the Security Gate Trailer;
- Two cameras will be mounted on light standards (one on the north side with the other on the south side) for the vehicle inspection area.

(Note: These cameras will be monitored at the Security Gate Trailer)

Security cameras are also planned in the following areas:

- One security camera will be mounted on a light standard at the tapping station located on the North Spur.
- One security camera will be mounted on a light standard at the Owner's Laydown Fueling Area depot.

(Note: These cameras will be monitored at the Main Security Building at the Accommodation Core Complex)

6.1.5 Drug and Alcohol Screening Process

In accordance with the **LCP Drug and Alcohol Standard (LCP-PT-MD-0000-LR-SD-0001-01)**, all project personnel and contractors will be required to undergo pre-access drug and alcohol screening. This requirement will exclude authorized visitors.

In addition to pre-access screening, personnel involved in an safety or operational related incident are required to undergo a post event screening to verify whether or not drug/alcohol consumption were a causal factor in the incident.

6.1.6 Vehicle Authorization

All vehicles coming to the site must meet applicable safety standards. All work related vehicles must:

- Be in a safe operating condition.
- Have functional seatbelts that are work by all occupants of the vehicle.
- Be equipped with a 20 pound dry chemical fire extinguisher.
- Must have an adequate first aid kit.
- Must have an amber flashing beacon clearly visible and operational.
- Must have a workable and audible back-up alarm.
- Must have a flagged buggy whip
- Have no more than three people riding in the front seat.
- Not carry any personnel in the back/box.
- Be insured to Nalcor requirements.
- Have licensing and proper insurance for public roadways or will not be allowed on site.

All vehicles not meeting these requirements will not be allowed on site.

6.1.7 Public Intervention

Security personnel may be required to interact with the public at various times

Security personnel will be instructed not to respond to any questions or interact with members of the public who may arrive at the security gate. In the case that members of the public arrive at the security gate with questions related to the Project, they will be politely directed to contact the Nalcor Informational Office in St. John's, NL.

In the event of NGO protestors arriving at the security gate the security incident reporting protocol will be followed:

- Security, Site Personnel and/or contractor personnel will not engage with or make contact with the protesting group,
- If practical and safe and the NGO protestors are outside of the secured area the security gate will be closed and locked,
- The Nalcor/SLI Communications/Information Flow established for Incident Reporting will be utilized for and incident relating to NGO Protests, etc. In the event the condition becomes more deliberate, hazardous or personnel are endangered, all operations on the site will stop immediately and personnel will evacuate the area if it is safe to do so.
- No further actions will be taken by the site personnel without explicit instructions from either Nalcor or SLI Site management.

At no time will security personnel enter into any type of physical contact or confrontational behaviour with members of the general public. Their role is strictly to advise, observe, and report.

Should activity outside the gate (via protests or otherwise) occur, the Security Guard at the Main Gate shall contact the Muskrat Falls Site Manager immediately. The Muskrat Falls Site Manager will make contact with the RCMP (Happy Valley- Goose Bay) to respond to the site to initiate action to remove individuals from company property as the situation dictates, particularly if the intent is to cause harm, disrupt or stop work activity. As required, The Muskrat Falls Site Manager may be required to file an injunction or other legal instrument with the provincial court in order for initiate RCMP action, as and when required.

6.2 AC/DC Transmission Lines, Soldier's Pond/Churchill Falls Convertor Stations and Switchyards, Transition Compounds and Electrodes.

It is anticipated that there will be several remotely located work areas during the construction of the transmission and distribution lines. Contractor shall ensure that adequate control measures are implemented to control access to such work sites during work and after work hours. Adequate control measures shall eliminate sabotage / theft and include protection of public safety during and after work hours.

Sub Station construction at the Muskrat Falls Generation Site shall be controlled by contractor provided security personnel with project specific access control protocols followed for access and egress to the substation construction area.

Construction of sub stations at both Churchill Falls and Soldiers Pond are considered isolated work site with security and access to be controlled by the contractor. Adequate control measures shall be implemented to control access to the site during and after construction work areas. Security provisions are required to be implemented by the contractor that will include controlling public access/safety and preventing the sabotage and theft and equipment from these sites. Such provisions include, but are not limited to:

- Planned/periodic patrols around the site by security services contractor personnel, particularly after work hours
- Utilization of barricading and signage at vehicle/equipment entrance points that will control access and egress to the site. Such controls will allow contractor personnel to control (i.e. screening, sign in, etc) unauthorized access to the site.

6.3 Marshalling Yards

There will be several designated Marshalling Yards for various types of equipment and materials found both on the project sites and external to the main project sites. Marshalling Yards will consist of both Contractor and Project controlled lay down areas.

Project controlled lay down areas will be adequately secured and monitored to prevent the sabotage and theft of materials and equipment. Project controlled lay downs will consist of both on site and off site areas. On site lay down areas will be afforded the security systems implied for the overall main site (i.e. gated access, security patrols, etc.). Off site project lay downs will require more detailed security planning that will require such sites to be:

- Barricaded to prevent theft and sabotage and protect public safety. Such barricading might potentially consist of fencing or some other physical means of barricading, supplemented by highly visibility signage;
 - Subject to planned patrols by contract security personnel, supplemented by video surveillance & signage;
 - Manned by qualified security personnel 24 hour / 7 days a week.
- Storage Containers (having at least 64 square feet of storage area) shall be equipped with the following:

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- Doors shall be secured using a hasp or slide bolt with a protective device to prohibit cutting of the padlock, and attached with non-removable bolts from the exterior.
 - Padlocks shall have a minimum ½ inch thick shackle with heel and toe locking.
 - Exterior hinge pins shall be rendered non-removable by design or welding.

Contractor designated lay down areas shall be directly under the management and control of the contractor. The contractor shall be responsible to ensure that all necessary control measures are implemented to prevent sabotage and theft and to ensure public safety is protected.

6.4 Project Offices

Project Offices currently consist of offices in St. Johns, NL, and the Muskrat Falls Construction Site Area. All personnel working in any project office has the responsibility to understand, respect and enforce building security on a daily basis. Opportunistic thieves and unscrupulous individuals often prey on those who are trusting and unaware of the security risks.

The Project Office located on Torbay Road in St. John's, NL is currently only accessible to authorized project personnel who are required to utilize an electronic swipe card for access to the building. To facilitate visitors, an administrator is positioned at the main entrance during working hours. Visitors cannot enter the building until the administrator verifies the intention of the visitor (s). As per the visitor policy, visitors are required to sign in and sign out and are to remain in the Main Entrance area until the appropriate project person arrives to meet the visitor. Visitors are to be accompanied by the respective project representative for the duration of the visit to the office.

Everyone who works in the office has the responsibility to understand, respect and enforce building security daily. Opportunistic thieves and unscrupulous individuals often prey on those who are trusting and unaware of the risks. All personnel are requested to take the following steps to maintain building security practices:

General Office Security

- All personnel are requested to visible display their ID badge for identification purposes.

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- Ensure guests/visitors are checked in at the receptionist and issued a visitor's badge. If you see any individual without a badge, ask them if they can produce their badge and escort them to the receptionist if they are unable to do so.
 - It is extremely important to report any suspicious unescorted person/stranger in the office at once to your manager/supervisor.
 - All personnel are requested to display their Identification Badge on their person at all times. Identification Badges must not be loaned to anyone in the office. Any lost or missing ID badge must be reported to the receptionist.
 - All exterior doors are provided with an alarm feature and should never be propped open at any time.
 - The practices of "tailgating" (unauthorized person following closely behind an authorized ID holder) and "piggybacking" (authorized person gaining access to the building and allowing others to follow by holding open a secure door) will no longer be permitted. Signs will be posted at each door this week to remind personnel of this
 - Third party visitors should sign-in with receptionist, be assigned a visitor badge and be escorted to employee contact. Visitors should be escorted back to reception, return visitor badge and sign out when finished for the day.

Personal Belongings:

- Always keep your purse, wallet, cash, credit cards or cell phone on your person or in a locked drawer at all times.
- Don't leave packages or other valuables around your desk or work area. Leave them at home or lock them up in the trunk of your car.
- Immediately report any theft or other criminal activity in the office to your supervisor.

Computer Data and Computer Generated Documents:

- Never leave confidential documents at printers or the fax machine.
- Always try to avoid leaving confidential documents in plain sight on your desktop.
- Store DVDs, USB drives and other mobile equipment under lock and key when not in use or you are away from your desk. Please be advised that USB drives used are to be the encrypted type as per Nalcor standards.
- Dispose of documents in accordance with the organization policies. Always shred confidential documents you wish to dispose of.

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- It is important to Lock the keyboard (Ctrl-Alt-Del) or Windows Logo + L as soon as you leave your workstation to ensure that others cannot access your information while you are away.
 - Attach and lock laptops computers with the Kensington lock at all times. If you have any questions or problems with attaching or using these locks please contact the Helpdesk for assistance.

7.0 Emergency/Incident Response

Security personnel will be involved as a key point of contact in emergency response activities, journey management and other general communications on site 24 hours per day. During evening hours, the Security Office will be the contact point for reporting any incident/ emergency. The on-duty Security Officer will be responsible for making contact with the Muskrat Falls Site Manager to initiate Emergency Response as prescribed in the **Emergency Response Plan. (LCP-PT-MD-0000-HS-PL-0004-01)** Coordinating with the Project Security Coordinator, security personnel will potentially be required to interface with local law enforcement. Security personnel will also assist in with the incident investigation process that might include, but not limited to; securing incident scenes, accompanying and escorting personnel from the project property, etc.

8.0 Contractor Access

8.1 Site Access Control

Nalcor reserves the right to refuse access and/or entry to its premises which includes all land, property, structures and installations, vehicles and equipment owned, leased, operated or otherwise directly controlled by Nalcor, including the LCP. The construction management team will maintain control over the movements of their construction contractor and subcontractor personnel within the project work site. These measures include, but are not limited to:

- Ensuring compliance to the site specific mandatory use of personal protective Equipment.
- The construction management team shall make provisions for the transport of all construction personnel between offsite vehicle parking areas and the project site.
- Project specific badging intended to identify and allow access to authorized personnel to Muskrat Falls (see section 5.3 for specific information).

-
- Fences and other physical barriers around the perimeter of the project site with appropriate signage and guard stations limiting authorized/unauthorized access.
 - Video cameras shall be installed at key locations throughout the site and at areas considered to be high potential for security threats.
 - Limitations on the number of vehicles on project property (see section 6.12 for more specific information). Ensure that all contractor vehicles are in compliance with site requirements for obeying site speed limit requirements and backing into parking spaces.
 - Random security checks on personnel and vehicles entering and leaving the Muskrat Falls Site.
 - Controlled access to Sub Station Construction Sites. Access to be controlled by contractor personnel through designated access and egress points, supplemented by signage and planned security patrols
 - Controlled access to designated transmission and distribution construction work areas. Physical barriers supplemented by signage to implied as control measures and be responsibility of contractor.

8.2 Public or Other Access Buildings

There will be occasions that construction activities will require workers to perform tasks that are adjacent to or directly in current operating facilities (i.e. the sub-station at Churchill Falls). Local security protocols shall be followed by all construction site personnel.

9.0 Control of Tools, Equipment & Materials

Individual contractors will be responsible for controlling and managing their equipment as it is brought onto and off the project site locations. Should overall project theft become a problem, the project will, at its discretion, implement a materials pass that will be required to remove tools and equipment from project sites.

10.0 Camera Pass

The use of cameras on site to collect personal photographs is not permitted at any Project Construction Site. Only project personnel requiring the use of a camera for project related matters are permitted to use cameras on site and must have formal

approval of the Muskrat Falls Site Manager prior to taking the pictures. If client determines that propriety or sensitive information is at risk for public disclosure, the utilization of a permitting process will be implemented.

11.0 Visitor Access

For site construction activity, the number of personnel on the construction site will generally be restricted to only those required to execute the work and manage the site. However, Visitor Access may be required on the site for business related reasons. As a result of various risks associated with Site Construction at the Muskrat Falls Site, site access will be restricted. Requirements for Construction Site Access are defined in the following document: ***Authorization Protocol for Access to Project Construction Sites.(LCP-PT-MD-0000-HS-PR-0001-01.) All personnel going to site must be familiar with this protocol prior to site entry.***

12.0 International Travel

All LCP employees travelling outside of Canada on Project related business shall comply with the requirements of the International Travel Policy. As a minimum, travellers shall:

- Complete the Security Plan Template from the International Travel Program
- Ensure travel authorization is obtained and travel is communicated to the appropriate supervisory personnel;
- Ensure that passport is current and in good, legible condition; with your number memorized and supporting documentation packed should your passport become lost or stolen;
- Ensure that all necessary health precautions are taken specific to the area you are travelling (i.e. immunizations/vaccinations) and that an adequate quantity of medication is taken with you (if applicable).
- Register with the Canadian Abroad Service, **as applicable.**
- Develop and keep on persons at all times, pertinent emergency numbers to call should an emergency situation arise.

13.0 Exclusions

This plan does not include supplier fabrication facilities and marine ports. Prior to the selection of other facilities and marine ports a security threat / risk assessment shall be conducted to define the level of security controls required. Construction on the Transition and Electrode Sites is currently excluded from this plan. Prior to the commencement of construction at these sites a security evaluation will be facilitated by the Security Coordinator to determine the appropriate level of security services to provide and how these services will be executed.

General public areas such as airports, highways, government medical facilities shall be excluded from this plan.

Nalcor Energy – Lower Churchill Project



Standard for Drug and Alcohol

LCP-PT-MD-0000-LR-SD-0001-01

Comments:	Total # of Pages (Including Cover): 30
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Status/ Revision	Date	Reason For Issue	Prepared By	Functional Manager Approval	Project Manager (Marine Crossings) Approval	Project Manager (Generation + Island Link) Approval	Project Director Approval
B1	10-Aug-2012	Issued for Use					
A1	31-Mar-11	Issue for Review					
CONFIDENTIALITY NOTE:			This document contains intellectual property of the Nalcor Energy – Lower Churchill Project and shall not be copied, used or distributed in whole or in part without the prior written consent from the Nalcor Energy – Lower Churchill Project.				

Inter-Departmental / Discipline Approval (where required)

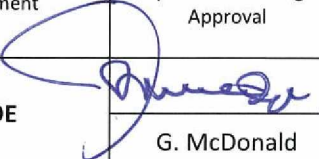

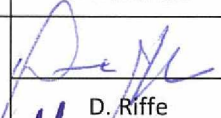
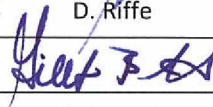
Department	Department Manager Approval	Date
HROE	 G. McDonald	May 31, 2012
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1.0 PURPOSE

Nalcor Energy ("Nalcor") is the proponent of the Lower Churchill Hydroelectric Project which includes the construction of the Muskrat Falls generating facility, Muskrat Falls reservoir clearing, Muskrat Falls transmission line construction, other ancillary sites and staging areas (collectively referred to as "the Sites"). Nalcor is committed to providing a safe workplace for its employees and contractors. Industrial construction projects of this size and complexity are inherently hazardous places to work. While on the various sites, personnel will often be working in conditions and around equipment and materials that, if handled without proper care and attention, can pose a threat to the safety of those personnel and the surrounding workforce. The use of illicit drugs, inappropriate use of alcohol and the misuse of medications and other substances can have serious affects on workers' health, job safety and overall job performance through erratic behaviours and irresponsible actions. For these reasons, this Comprehensive Drug and Alcohol Standard ("Standard") has been established. This Standard recognizes the importance of an accommodation process for those persons who may have a drug or alcohol problem.

Guiding Principles

The Alcohol and Drug Standard has been developed based the following Guiding Principles:

- Nalcor is committed to providing a safe workplace for its employees and contractors;
- Recognizing the importance of an accommodation process for those persons who may have a drug or alcohol problem;
- The standard applies to all Nalcor employees, contractors, subcontractors, and their respective employees ("Workers");
- Ensuring that Workers are treated fairly and with respect;
- Workers accept responsibility for their own safety and the safety of others;
- Requiring alignment and commitment on the part of all levels of project management; and
- Zero tolerance for possession and/or use of drugs and alcohol.

2.0 SCOPE

This Standard applies to all Nalcor employees, contractors, subcontractors, and their respective employees ("Workers") working on the Sites and persons seeking a site pass required to access the various Sites ("Site Access"). The primary objectives of the Standard are to:

- a) Provide safe work Sites for all Workers and personnel whose safety may be adversely affected by the conduct of other Workers; and
- b) Ensure Workers are treated fairly and with respect.

We all share the responsibility to ensure that we, and the Workers around us, are all able to safely and reliably perform work duties and that everyone remains fit for duty throughout their work shift. In order to support this responsibility, Nalcor requires all contractors and subcontractors ("Contractors") to establish and fully implement their own Drug and Alcohol programs. All Contractors must commit to taking appropriate and responsible actions required maintaining a safe work place. This requires commitment on the part of all levels of project management, Contractor management, and all Workers to accept responsibility for their own safety and the safety of others. This commitment includes recognizing that conduct or behaviour off Site may adversely affect the ability to safely and reliably perform duties on the Sites. In developing this Standard, Nalcor has adopted the guidelines of the Canadian Model for Providing a Safe Workplace, Alcohol and Drug Guidelines and Rules (2010), or the most current version ("the Canadian Model"). The Canadian Model establishes a minimum industry standard for a safe workplace, is a part of an overall approach to employee health and safety. The standard provides a specific policy with respect to alcohol and drugs in the workplace and strives to establish a consistent industry practice.

As a condition of continued employment or contracting with Nalcor, employees, Contractors, and Workers must accept the terms of this Standard and comply with this Standard in their own drug and alcohol policy, which must also be at least equivalent to the requirements set out in the Canadian Model and this Standard.

This standard shall come into effect at the discretion of the Project Director, at a date no later than the commencement of work at the site.

3.0 DEFINITIONS

3.01 Zero Tolerance

Nalcor is committed to providing a safe workplace for Contractors, Workers, and persons seeking Site Access. In the interest of the safety of those persons or Workers on Site, there is zero tolerance for possession and/or use of drugs and alcohol.

- a) Persons or Workers on any Nalcor Site who use or are in the possession of alcohol, illegal drugs, or illegal drug paraphernalia shall be removed from the

Sites, Site Access shall be revoked, and such persons or Workers shall be prohibited from obtaining Site Access indefinitely;

- b) Persons or Workers on Sites found to be under the influence of alcohol or illegal drugs will be removed from Sites, Site Access shall be revoked, and such persons or Workers shall be prohibited from obtaining Site Access indefinitely;
- c) Persons on any Site who distribute, sell, or attempt to sell drugs or illegal drug paraphernalia, or engage in unauthorized distribution, offering, or sale of prescription medications, shall be removed from such site. Site Access shall be revoked and such person or Workers shall be prohibited from obtaining Site Access indefinitely;
- d) Persons or Workers on any Site under the influence of legal drugs or non-prescription medication which interfere with their judgment, coordination, or concentration are not to attend at any of the Sites and will be removed from such site. Site Access shall be revoked and such person or persons shall be prohibited from obtaining Site Access indefinitely; (in accordance with Appendix C)
- e) Every person, Worker, or Contractor working on any of the Sites is required to report to the EPC/EPCM site safety personnel, EPCM site labour relations representative, the contractor, any other EPCM management person, or Nalcor, any breach of this Standard which they have observed or have been made aware of immediately, and failure to report any breach of this Standard may result in revocation of Site Access; and
- f) Nalcor and/or the EPCM will not grant Site Access to any person who has tested non-negative for illegal or illicit drugs, alcohol, or any medication found to be causing impairment, as per this Standard.

3.02 Workplace Substance Abuse and Effects

Work site substance abuse is defined as:

The use of potentially impairing substances, to the point at which it has the potential to adversely affect performance and/or safety on any of the Sites.

The impairment may either be directly through intoxication and/or residual effects, or indirectly through social and/or health problems. Substance abuse is considered to occur when a drug is taken without medical reasons, or if a substance impairs and/or jeopardizes the health or safety of oneself or others. Abuse can occur by using a

substance too much, too often, for the wrong reasons, at the wrong time, or at the wrong place.

The range of substances that are abused is wide and can include (but is not limited to) alcohol, cocaine (including crack), marijuana, other illicit drugs, solvents, and misuse of prescription drugs or over-the-counter medications.

Category	Examples	Examples of General Effects
Alcohol	beer, wine, spirits	impaired judgment, slowed reflexes, impaired motor function, fatigue or drowsiness, coma, overdose may be fatal
Cannabis	marijuana, hashish	distorted sense of time, impaired memory, impaired coordination
Depressants	sleeping pills, sedatives, some tranquilizers	inattention, slowed reflexes, depression, impaired balance, drowsiness, coma, overdose may be fatal
Hallucinogens	Lysergic acid diethylamide (LSD), phencyclidine (PCP), mescaline	inattention, sensory illusions, hallucinations, disorientation, psychosis
Inhalants	hydrocarbons, solvents, gasoline	intoxication similar to alcohol, dizziness, headache
Opiates	morphine, heroin, codeine, some prescription pain medications	loss of interest, "nodding", overdose may be fatal. If used by injection, the sharing of needles may spread Hepatitis B or C and HIV/AIDS
Stimulants	cocaine, amphetamines	elevated mood, over activity, tension/anxiety, rapid heartbeat, constriction of blood vessels

3.03 Safety Sensitive Positions

The Canadian Human Rights Commission defines a Safety Sensitive Position as:

One in which incapacity due to drug or alcohol impairment could result in direct and significant risk of injury to a Worker, others, or the environment.

Whether a job can be categorized as safety sensitive must be considered within the context of the industry and the particular workplace.

All persons seeking Site Access, if granted, will be working in a safety sensitive position and accordingly, such person will submit to a drug and alcohol testing procedure.

All workers working on the Sites are considered to be working in safety sensitive positions and will submit to a drug and alcohol testing procedure, which meets this Standard in the following circumstances:

- a. Where there is reasonable grounds as per this Standard; and
- b. Post-incident as per this Standard.

Construction industry sites, particularly sites with this magnitude of construction work, are particularly high-risk areas. In keeping with this definition, Nalcor has identified specific duties and accountabilities as safety sensitive within the Sites, which includes, but is not limited to, the following:

- a. Where the duty requires operating or working with moving machinery, equipment, tools, or mobile equipment;
- b. Where the duty requires the Worker to handle hazardous chemicals (As identified by the WHMIS legislation), hazardous materials, dangerous materials, and any other materials identified as hazardous through WHMIS.
- c. Where the duty requires the Worker to work in an area where blasting activities may occur;
- d. Where the duty requires working knowledge of the lock-out procedures, confined space procedures, procedures for working at heights, or any other procedures required on the Sites;
- e. Where the duty requires a Worker to work periodically in an area where mobile equipment or other equipment is operating, or construction activities are occurring;
- f. Where the duty requires a Worker to travel in, on, or around the Sites;
- g. Where the duty requires the Worker to wear personal protective equipment (e.g. hard hat, protective eyewear, safety boots, respirator, etc.);

- h. Where the duty requires the Worker to work alone;
- i. Where the duty requires the Worker to work above normal elevation (e.g. use of fall protection, step ladder, scaffolding, step stool, etc.);
- j. Where the duty requires more than normal physical effort (e.g. lift more than 10 kg);
- k. Where the Worker is responsible for the welfare and safety of others;
- l. Where the Worker puts themselves or others at risk of injury or death;
- m. Where the Worker can put the environment at risk placing the employer at significant liability risk; and
- n. Where the duties require supervision or support of any of the above activities.

Delivery companies should be required to have alcohol and drug policies under Transportation Regulations. Any Executive personnel and other short term visitors will be made aware of the alcohol and drug policy prior to arrival at site. These personnel may, in fact, be subject to testing should circumstances dictate as referred to in this standard.

4.0 CAMP

At such time as camp rules are established, they shall be adhered to at all times.

5.0 ABBREVIATIONS AND ACRONYMS

Term	Definition
AMP	Amphetamines
BAT	Breath alcohol technician
Canadian Model	Canadian Model for providing a safe workplace, alcohol and drug guideline and rules (2010)
Certified Lab	A Lab certified by the Substance Abuse and Mental Health Services Administration

	under the National Laboratory Certification Program
COC	Cocaine
Contractors	Nalcor contractors and their subcontractors
DCR	Designated Contractor Representative
DNR	Designated Nalcor Representative
EPC	Engineering, Procurement, Construction
EPCM	Engineering, Procurement, Construction Management
MRO	Medical Review Officer
Nalcor	Nalcor Energy
NHTSA	National Highway Traffic Safety Administration
OPI	Opiates
PCP	Phencyclidine
POCT	A point of care testing procedure
Site Access	A Site pass required to access the Sites
SLI	SNC Lavalin Inc.
Standard	Comprehensive Drug and Alcohol Standard
STT	Screening test technician
THC	Marijuana
The Sites	Lower Churchill Hydro Electric Project including the construction of Muskrat Falls

Generating Facility, Muskrat Falls Reservoir clearing, Muskrat Falls transmission line construction, other ancillary sites and staging areas.

WHMIS

Workplace Hazardous Materials Information System

Workers

Nalcor employees, contractors, subcontractors and their respective employees

6.0 REFERENCE DOCUMENTS AND/OR ASSOCIATED FORMS

Nalcor Energy LCP Safety & Health Management Plan
 SLI Safety Management Plan
 Canadian Model

7.0 RESPONSIBILITIES

Nalcor Energy LCP Safety and Health Manager

 Labour Relations and Team Effectiveness Lead

8.0 TESTING PROCESS

Drug and alcohol testing as required by this Standard will be performed by an accredited drug and alcohol testing agency who will manage the process of taking test samples, having all non-negative test result samples sent for confirmation testing at a lab certified by the Substance Abuse and Mental Health Services administration under the National Laboratory Certification Program ("Certified Lab"), have the results assessed by a Medical Review Officer ("MRO") that will report non-negative test results to the Designated Contractor Representative ("DCR"), the Designated Nalcor Representative ("DNR"), and the designated EPCM Site Access Administrator ("Administrator"). This is laid out in the attached Drug and Alcohol Testing Procedures document, Appendix "A".

For reasonable grounds or post-incident drug and alcohol testing, as per this Standard, Contractors shall utilize the Sites accredited drug and alcohol testing agency. All non-negative test samples will be sent for confirmation to a Certified Lab.

The substances that will be tested for are contained in the following five panel process:

	TARGET DRUG	SCREENING CONCENTRATION	CONFIRMATION CONCENTRATION
THC	MARIJUANA	50 ng/ml	15 ng/ml
COC	COCAINE	300 ng/ml	150 ng/ml
OPI	OPIATES	2000 ng/ml	2000 ng/ml
PCP	PHENCYCLIDINE	25 ng/ml	25 ng/ml
AMP	AMPHETAMINE	1000 ng/ml	500 ng/ml

9.0 SITE ACCESS

All persons seeking site access shall undergo drug and alcohol testing as per this standard. The pre-access test must be completed before deployment on Sites and not more than thirty (30) days prior to the deployment from the Union or Contractor to the work Sites. The pre-access test will be valid for return access to Sites for

- a) A period of not more than thirty (30) days from the date the test was completed. Workers or persons will be required to provide proof of a negative pre-access test to the respective Contractor for each subsequent return to Sites, or;
- b) For as long as the Worker remains in continuous employment with the same Contractor. Continuous employment means without lay-off or termination of employment.

In the case of a non-negative test result for persons seeking Site Access, Site Access will not be issued to that person in the future except in accordance with Section 10, below. The DCR or DNR must inform the person of these consequences and their options, as described below. In addition to the DCR or DNR, the persons who have applied for Site Access who have tested non-negative will be provided to the Administrator and such persons will not be granted Site Access except in accordance with Section 10, below.

10.0 WAITING PERIOD FOR SECOND SITE ACCESS TEST

Site Access will not be granted to a person who has previously tested non-negative except as follows:

- a) At least thirty (30) days have elapsed since the non-negative test is confirmed as per Section 9 above, such person tests negative as per Section 9 above, such person agrees to return to work terms and conditions satisfactory to the administrator, DCR and DNR, which shall include professionally or medically

directed drug and alcohol testing; which must be reported to the Administrator and the DCR and DNR and such person is cleared as fit to work on the Site safely.

- b) Such person, through or by utilization of the public health care system (contact information is described below) or other means, meets all of the following conditions:
- (i) The person voluntarily meets with a substance abuse professional, who will determine whether the person requires treatment for a substance abuse problem, or such person is fit to work on Sites safely.
 - (ii) In the case where a substance abuse professional determines if the person is fit to work on the Sites, such substance abuse professional will provide a written report containing any restrictions, return to work conditions, and confirmation that the person is fit to work on the Sites safely to the Administrator and the DCR or the DNR. The report of the substance abuse professional must be in a form satisfactory to the Administrator, DCR and/or the DNR. Such person may be subject to a Return to Work Agreement in a form satisfactory to the Administrator, the DCR, or the DNR, which shall be based on the recommendations of the substance abuse professional in consultation with the Administrator, the DCR and/or the DNR, and which may include professionally or medically directed drug and alcohol testing.
 - (iii) In the case where a substance abuse professional determines the person has a substance abuse problem and requires treatment, such person shall provide to the Administrator and the DCR or DNR written confirmation from a substance abuse professional in a form satisfactory to the Administrator and the DCR or DNR when an assessment and/or treatment has been successfully completed, this report must contain any recommendations, work restrictions, and confirmation that the person is fit to work on Sites safely. Such a person who has successfully completed an assessment and/or treatment must sign a Return to Work Agreement in a form satisfactory to the Administrator and the DCR or DNR, which shall be based on the recommendations of the substance abuse professional in consultation with the Administrator, the DCR and/or the DNR, which may include professionally or medically directed drug and alcohol testing.
 - (iv) The person must execute a Substance Abuse Professional Release of Confidential Information, attached as Appendix "B".

- (v) The person must test negative as per Section 8 above and this must be reported to the Administrator and the DCR or DNR.

10.01 Providing Substance Abuse Support Information and Accommodation

The DCR or DNR must inform a person who has tested non-negative that if the person wishes to use the option to seek help and support, the Newfoundland and Labrador public health care system provides many options for support, which are covered by Medicare, such as outpatient counselling, adult residential treatment, detoxification services, and more. The DCR or DNR must tell the person that detailed information on services can be obtained online at

http://www.health.gov.nl.ca/health/commhlth_old/factlist/services_available.htm and by phoning 1-888-737-4668.

10.02 Confidentiality of Substance Abuse Professional Information

In order to preserve the confidentiality of information provided by a substance abuse professional, the Administrator, the DCR or DNR, and any person to whom disclosure is permitted under this Standard, must not disclose the information to any person other than a person who is required to know the test results to discharge an obligation under this Standard.

10.03 Testing Non-Negative More Than Once For Site Access

In the event that any person tests non-negative more than once when seeking Site Access, such person shall be prohibited from obtaining Site Access indefinitely.

11.0 REASONABLE GROUNDS TESTING

- a) In any situation when a Worker at work or within two hours prior to reporting to work appears, or is reported by another Worker to appear to be unfit for work, a supervisor or manager of that Worker must investigate the situation. If they, in consultation with the next level of management, (both levels must sign off) conclude there are reasonable grounds to believe the Worker is under the influence of drugs or alcohol, or that drugs or alcohol may be a contributing factor to the Workers condition, the Worker will be requested to submit to a drug and alcohol test. Factors to consider in deciding if reasonable grounds for testing exist include, but are not limited to:
 - (i) The odour of alcohol and/or drugs detected on the Worker;
 - (ii) The observed use of a substance by the Worker;

- (iii) Where the Worker's appearance, and/or performance, and/or behaviour strongly suggests that the individual is under the influence of drugs or alcohol; and
 - (iv) Where, after a fit for work assessment performed by a supervisor, the supervisor believes the Worker may be under the influence of drugs or alcohol.
- b) A supervisor or manager of a Worker must provide the Worker with the reasons for requesting a drug and alcohol test, and those reasons must be documented. Documentation should include a reasonable grounds checklist, a copy of which is attached as Appendix "C".
- c) Tests are to be conducted as soon as reasonably practicable following a reasonable grounds determination.
- d) Where testing occurs more than four (4) hours from the time of the determination, the Contractor must provide to Nalcor or the designate of Nalcor, in writing, a reason for the delay.

12.0 POST-INCIDENT TESTING

- a) A supervisor or manager of a Worker must request the Worker to submit to a drug and alcohol test if the supervisor or manager and the next level of management present on the Worksite, have reasonable grounds to believe that the Worker was involved in a safety related incident, a significant near miss incident, which under different circumstances could have caused serious injury or property damage or other potentially dangerous incident/activity. The supervisor should request that the worker stop all work related activities prior to testing for reasonable grounds.
- b) Workers referred for drug and alcohol testing will also include those who are identified, with reasonable grounds, as having been directly involved in the chain of acts or omissions leading up to the event or incident.
- c) A drug and alcohol test is automatic after a significant incident, unless there is clear evidence that the acts or omissions of Worker(s) could not have been a contributing factor (e.g. structural or mechanical failure). A significant incident would include but not be limited to the following:
 - (i) A fatality or serious personal injury to any person;

- (ii) An environmental spill with significant implications;
 - (iii) Significant loss or damage to any property, equipment, or vehicles;
 - (iv) Significant financial loss; or
 - (v) A near-miss incident that had the potential for significant damage, or environmental harm.
- d) In any situation, whether the incident is significant or not, reasonable grounds testing may occur, subject to 11.0.
- e) Workers must not use alcohol for eight hours after the incident or until drug and alcohol testing has occurred, or the Worker is advised a test is not required.

13.0 TESTING REQUEST

The supervisor or manager must request that all workers concerned submit to drug and alcohol testing immediately in the event of reasonable grounds, or immediately following a significant accident, near miss, or other potentially dangerous incident, but if it is not practicable or reasonable to do so until a later time, collection shall not occur more than 8 hours after the incident for an alcohol test, and 32 hours after the incident for a drug test. Until the test is completed the employee shall remain in the care of his/her manager/supervisor and transferred to a medical professional during actual treatment for an incident.

14.0 FAIL TO TEST

Any Worker who fails to comply with a testing request, or delays a test pursuant to this Standard, or refuses to provide a sample for a test, will be considered to be in breach of this Standard and such Worker will be removed from the Sites, have their Site Access revoked, and shall be prohibited from obtaining Site Access indefinitely. If an attempt to tamper with a test sample is confirmed, the employer of such Worker shall remove such Worker from the Sites, shall not deploy such Worker to the Sites thereafter, and such Worker shall be prohibited from obtaining Site Access indefinitely.

15.0 POTENTIAL RETURN TO SITE AND REASONABLE GROUNDS POST-INCIDENT

Any Worker denied access to the Sites due to the results of drug and alcohol testing for reasonable grounds or post-incident may, subject to Nalcor's (EPCM) approval and the Contractor's approval, be permitted Site Access subject to the following conditions:

- a) The Worker voluntarily meets with a substance abuse professional, who will make a determination whether the Worker requires treatment for a substance abuse problem or such Worker does not have a substance abuse problem. If the substance abuse professional determines that the individual does not have a substance abuse problem or is a recreational drug or alcohol user, such individual shall not be permitted site access unless Nalcor's (EPCM) determines there are exceptional circumstances that warrant considering such individual be granted site access and such individual meets the conditions set out in Section 15 (b), (c), (d), and (e) below.
- b) In the case where a substance abuse professional determines the Worker is fit to work on the Sites, such substance abuse professional will provide a written report containing any restrictions, return to work conditions, and confirmation that the Worker is fit to work on the Sites safely to the Administrator and the DCR or the DNR. The report of the substance abuse professional must be in a form satisfactory to the Administrator, DCR and/or the DNR. Such Worker may be subject to a Return to Work Agreement in a form satisfactory to the Administrator and the DCR and/or the DNR, which shall be based on the recommendations of the substance abuse professional in consultation with the Administrator and the DCR and/or the DNR, and which may include professionally or medically directed drug and alcohol testing.
- c) In the case where a substance abuse professional determines the Worker has a substance abuse problem and requires treatment, such Worker shall provide to the Administrator and the DCR or DNR written confirmation from a substance abuse professional in a form satisfactory to the Administrator and the DCR or DNR when an assessment and/or treatment has been successfully completed. This report must contain any recommendations, work restrictions and confirmation that the Worker is fit to work on Sites safely. Such Worker who has successfully completed an assessment and/or treatment must sign a Return to Work Agreement in a form satisfactory to the Administrator and the DCR or DNR, which shall be based on the recommendations of the substance abuse professional in consultation with the Administrator and the DCR and/or the DNR, which may include professionally or medically directed drug and alcohol testing.
- d) The Worker must execute a Substance Abuse Professional Release of Confidential Information, attached as Appendix "B".
- e) The worker must test negative as per Section 8 above, and this must be reported to the Administrator and the DCR or DNR.

15.01 Providing Substance Abuse Support Information and Accommodation

The DCR or DNR must inform a Worker who has tested non-negative that if the Worker wishes to use the option to seek help and support, the Newfoundland and Labrador public health care system provides many options for support, which are covered by Medicare, such as outpatient counseling, adult residential treatment, detoxification services, and more. The DCR or DNR must tell the Worker that detailed information on services can be obtained online at

http://www.health.gov.nl.ca/health/commhlth_old/factlist/services_available.htm and by phoning 1-888-737-4668.

15.02 Confidentiality of Substance Abuse Professional Information

In order to preserve the confidentiality of information provided by a substance abuse professional, the Administrator, the DCR or DNR, and any Worker to whom disclosure is permitted under this standard, must not disclose the information to any Worker other than a Worker who needs to know the test results to discharge an obligation under this Standard or except as required by law.

15.03 Testing Non-Negative More Than Once

In the event that any Worker tests non-negative more than once, such Worker shall be prohibited from obtaining Site Access indefinitely.

16.0 CONSEQUENCES OF NON-COMPLIANCE WITH THIS STANDARD

Non-compliance by a Worker with this Standard will result in Site Access being temporarily revoked until the investigation of the reasons for non-compliance and the incident, including tests and results in a final determination of corrective action. Workers, who are found in non-compliance with this Standard may be removed from Sites and have their Site Access revoked by Nalcor or Nalcor's designate and may be prohibited from obtaining Site Access indefinitely. Persons who are found to be in non-compliance of this standard may be subject to discipline up to and including termination by the Contractor.

17.0 ALCOHOL AND DRUG TESTING REPORTS

The Contractors and each accredited drug and alcohol testing agency shall maintain the following:

- a) A report from each accredited drug and alcohol testing agency used by the Contractor that specifies the number of drug and alcohol tests performed, the number of positive or non-negative tests by each type of test requirement, and the number of tampered specimens. Test requirement types include those for pre-access, reasonable grounds, and post-incident. This report shall be provided by the EPCM to Nalcor quarterly or more often if required by Nalcor.
- b) Each Contractor shall maintain a report which identifies the total number of persons or Workers who have tested non-negative by specific trade, the number of persons or Workers tested by specific trade, but shall not provide the names of persons or Workers. A copy of this report shall be provided in hard copy and electronically by the Contractor to Nalcor quarterly or more often if required by Nalcor.

18.0 PROOF OF COMPLIANCE

Nalcor shall have the right to request proof of compliance to this Standard at any time.

19.0 SEARCH AND SEIZURE – POSSESSION OF DRUG AND ALCOHOL PARAPHERNALIA

Nalcor or its designate reserves the right to investigate, and/or require the Contractor or subcontractors to investigate, any situation when there are reasonable grounds to believe that alcohol, illicit drugs, or illicit drug paraphernalia are present on Site, in violation of this Standard or the Sites rules.

Nalcor or its designate, Contractors or subcontractors and their Workers are responsible for identifying situations where a search and seizure may be reasonable. Reasonable may be based on a combination of indicators which may include behaviour, odour, information received, or presence of paraphernalia. The supervisors will be responsible for advising their manager of the situation, who, in conjunction with onsite security, onsite Health and Safety Management (or their designates), and local police authorities, where appropriate, will make the decision as to whether or not to initiate a search.

On the Sites, Nalcor or Nalcor's designate may, for reasonable grounds, have Nalcor's supervision or the supervision of Nalcor's designate, Contractor supervisors and/or authorized search and inspection specialists, including scent-trained animals, conduct unannounced searches and inspections of Contractors, subcontractors, and/or Workers and their property. Property may include, but not limited to wallets, purses, lockers, baggage, offices, desks, tool boxes, clothing and vehicles. Where practical, such searches shall be in the presence of the affected Worker.

All Nalcor employees, contractors, sub-contractors and visitors and their property may be subject to search and seizure on arrival and departure from the Sites.

Seizure and future control of any alcohol, drugs, or drug paraphernalia will be directed by the Security personnel.

Nalcor or Nalcor’s designate, along with Contractor management (if Contractor personnel involved) may determine whether law enforcement agencies will be contacted.

In the event any Nalcor employee, contractor, sub-contractor and visitor refuses to submit to a search or is believed to be in violation of this Standard as a result of a search, such Worker or person’s Site Access will be temporarily revoked until an investigation of the refusal to submit to a search or violation of the Standard is completed. Workers or persons who are found in non-compliance with this Standard may be removed from Sites, have their Site Access revoked by Nalcor or its designate and may be prohibited from obtaining Site Access indefinitely. Persons found in violation of this Standard may be subject to discipline up to and including termination by the Contractor.

Approved By	Title: Project Director
Date	

20.0 ATTACHMENTS/APPENDICES

Appendix A – Drug and Alcohol Testing Procedures

Appendix B – Substance Abuse Professional Release of Confidential Information

Appendix C – Reasonable Grounds Checklist

APPENDIX "A"
Drug and Alcohol Testing Procedures

The following procedures are a general overview only. More detailed information may be obtained from the approved accredited drug and alcohol testing agency. As an alternative to the drug and alcohol testing procedure contained herein, the approved accredited drug and alcohol testing agency may utilize a point of care testing procedure commonly referred to as a quick test ("POCT"). In the case of POCT, all non-negative tests must be confirmed by a Certified Lab.

I. Alcohol testing

General

1. The donor is the person or Worker from whom a breath or saliva sample is collected.
2. The donor is directed to go to a collection site in order to give a breath or saliva sample.
3. The breath alcohol technician ("BAT") or the screening test technician ("STT") as appropriate establishes the identity of the donor. Photo identification is preferable. Positive identification by a Contractor or company representative who holds a supervisory position is acceptable.
4. The BAT or STT as appropriate explains the testing procedure to the donor.
5. The Contractor or company must securely store information about alcohol test results to ensure that disclosure to unauthorized persons does not occur.
6. Breath testing and saliva testing devices are used to conduct alcohol screening tests and must be listed on the National Highway Traffic Safety Administrations ("NHTSA") conforming products list.

Breath testing

1. The BAT and the donor complete those parts of the alcohol testing form that is to be completed before the donor provides a breath sample.
2. The BAT opens an individually wrapped or a sealed mouthpiece in the presence of the donor and attaches it to the breath testing device in the prescribed manner.

3. The BAT explains to the donor how to provide a breath sample and asks the donor to provide a breath sample.
4. The BAT reads the test result and ensures that the test result is recorded on the alcohol testing form after showing the results to the donor.
5. The BAT completes the part of the alcohol testing form that is to be completed after the donor provides a breath sample and asks the donor to do so as well.
6. If the test result shows an alcohol level that is less than 0.020 grams/210 litres of breath, the BAT informs the donor that there is no need to conduct any further testing and reports the result in a confidential manner to the DCR or DNR. While the initial communication need not be in writing, the BAT must subsequently provide a written report of the test results to the DCR or DNR.
7. If the test result shows an alcohol level that is equal to or greater than 0.020 grams/210 litres of breath, the BAT informs the donor of the need to conduct a confirmation test.

Saliva testing

1. The STT and the donor complete those parts of the alcohol testing form that are to be completed before the donor provides a sample.
2. The STT checks the expiration date of the saliva testing device shows the date to the person or Worker and uses a saliva testing device only if the expiration date has not passed.
3. The STT opens an individually wrapped or a sealed package containing the saliva testing device in the presence of the donor.
4. The STT invites the donor to insert the saliva testing device into the donor's mouth for the time it takes to secure a proper specimen. If the donor does not wish to do this, the collection site person offers to do so.
5. The STT reads the result the saliva testing device produces and records the test result on the alcohol testing form after showing the results to the donor.
6. The STT completes the part of the alcohol testing form that is to be completed after the donor provides a saliva sample and asks the donor to do so as well.
7. If the test result shows an alcohol level that is less than 0.020 grams of alcohol in 100 millilitres of saliva or an equivalent concentration in other units, the STT informs the donor that there is no need to conduct any further testing and

reports the result in a confidential manner to the DCR or DNR. While the initial communication need not be in writing, the STT must subsequently provide a written report of the test results to the DCR or DNR.

8. If the test result shows an alcohol level that is equal to or greater than 0.020 grams of alcohol in 100 millilitres of saliva or an equivalent concentration in other units, the STT informs the donor of the need to conduct a confirmation test.

Confirmation test

1. If a breath alcohol testing device was used for the screening test, an evidential breath alcohol device must be used to conduct the alcohol confirmation test. If a saliva testing device was used for the screening test, the confirmation test will use an evidential breath alcohol testing device.
2. The BAT advises the donor not to eat, drink, put anything into his or her mouth or belch before the confirmation test is complete.
3. The confirmation test must start not less than fifteen minutes after the completion of the screening test and not more than thirty minutes after the completion of the screening test.
4. The BAT and the donor complete those parts of the alcohol testing form that are to be completed before the donor provides a breath sample.
5. The BAT opens a new individually wrapped or sealed mouthpiece in the presence of the donor and inserts it into the breath testing device in the prescribed manner.
6. The BAT explains to the donor how to provide a breath sample and asks the donor to provide a breath sample.
7. The BAT reads the test result on the device and shows the donor the result displayed. If the confirmation test result is equal to or in excess of 0.040 grams per 210 litres of breath, the BAT will do an external calibration check (accuracy check) to ensure the device is in working order. The BAT ensures that the test result is recorded on the alcohol testing form. The BAT verifies the printed results with the donor.
8. The BAT completes the part of the alcohol testing form that is to be completed after the donor provides a breath sample and asks the donor to do so as well.

9. The BAT immediately reports in a confidential manner the test results to the Administrator, DCR or DNR. While the initial communication need not be in writing, the BAT must subsequently provide a written report of the test results to the Administrator, DCR or DNR.

II. Drug testing

1. The donor is the person or Worker from whom a urine specimen is collected.
2. The donor is directed to go to a collection site in order to give a urine specimen.
3. The collection site person must establish the identity of the donor. Photo identification is preferable. Positive identification by a Contractor or company representative who holds a supervisory position is acceptable.
4. The donor must remove coveralls, jacket, coat, hat or any other outer clothing and leave these garments and any briefcase or purse with the collection site person.
5. The donor must remove any items from his or her pockets and allow the collection site person to inspect them to determine that no items are present which could be used to adulterate a specimen.
6. The donor must give up possession of any item which could be used to adulterate a specimen to the collection site person until the donor has completed the testing process.
7. The collection site person may set a reasonable time limit for providing a urine specimen.
8. The collection site person selects or allows the donor to select an individually wrapped or sealed specimen container. Either the collection site person or the donor, in the presence of the other, must unwrap or break the seal of the specimen container.
9. The donor may provide his or her urine specimen in private, in most circumstances. The specimen must contain at least forty-five millilitres.
10. The collection site person notes on the chain of custody form any unusual donor behaviour.
11. The collection site person determines the volume and temperature of the urine in the specimen container.

12. The collection site person inspects the specimen and notes on the chain of custody form any unusual findings. If the temperature of the specimen is outside the acceptable range or there is evidence that the specimen has been tampered with, the donor must provide another specimen under direct observation by the collection site person or another person if the collection site person is not the same gender as the donor.
13. The collection site person splits the urine specimen into two specimen bottles. One bottle is the primary specimen and the other is the split specimen.
14. The collection site person places a tamper-evident bottle seal on each of the specimen bottles and writes the date on the tamper-evident seals.
15. The donor must initial the tamper-evident bottle seals to certify that the bottles contain the urine specimen the donor provided.
16. The donor and the collection site person complete the chain of custody form and seal the specimen bottles and the laboratory copy of the chain of custody form in a plastic bag.
17. The collection site personnel arrange to ship the two specimen bottles to the laboratory as quickly as possible.
18. The laboratory must be the holder of a certificate issued by the Substance Abuse and Mental Health Services Administration of the United States Department of Health and Human Services under the National Laboratory Certification Program.
19. The laboratory must use chain of custody procedures to maintain control and accountability of urine specimens at all times.
20. Laboratory personnel inspect each package for evidence of possible tampering and note evidence of tampering on the specimen forms.
21. Laboratory personnel conduct validity testing to determine whether certain adulterants or foreign substances were added to the urine specimen.
22. Laboratory personnel conduct an initial screening test on the primary specimen for the drugs set out in Section 8 of the Standard using established immunoassay procedures. No further testing is conducted if the initial screening test produces a negative test result.
23. Laboratory personnel conduct a confirmatory test on specimens identified as positive by the initial screening test. The confirmatory test uses gas chromatography/mass spectrometry.

24. A certifying scientist reviews the test results before certifying the results as an accurate report.
25. The laboratory reports the test results on the primary specimen to the MRO in confidence.
26. The MRO, if satisfied that there is no legitimate medical explanation for a non-negative test result, will inform the Administrator, DCR or DNR in a confidential written report that a person tested positive. Prior to making a final decision on whether a test result is non-negative, the MRO must give the person an opportunity to discuss the results. The MRO shall report to the DCR or DNR whether the test result is negative, tampered, invalid or positive, or, if positive, whether or not there is a legitimate medical explanation. The MRO shall also report to the Administrator when the test is tampered, invalid or positive.
27. A person or Worker who has received notice from the MRO that he or she has tested non-negative may ask the MRO within 72 hours of receiving notice that he or she has tested positive to direct another laboratory to test the split specimen. The person or Worker is responsible for reimbursing the Contractor or company for the cost of the second test.
28. The laboratory reports the test results on the split specimen to the MRO in confidence.
29. The MRO will declare the test results negative if the test results for the split specimen are negative and the failure to reconfirm is not due to the presence of an interfering substance or adulterant.

APPENDIX "B"
SUBSTANCE ABUSE PROFESSIONAL
RELEASE OF CONFIDENTIAL INFORMATION

I (Person or Worker), _____, give permission to _____ to contact: _____ (Name) (Substance Abuse Professional Name)													
TO	<table style="width:100%; border: none;"> <tr> <td style="width: 50%; border: none;">Name: Insert Name</td> <td style="width: 50%; border: none;">Name: Insert Name</td> </tr> <tr> <td style="border: none;">Organization: Insert Name</td> <td style="border: none;">Organization: Contractor/Employer Name</td> </tr> <tr> <td style="border: none;">Title: Insert Name</td> <td style="border: none;">Title: Insert Title</td> </tr> <tr> <td style="border: none;">Address: Address Province: NL</td> <td style="border: none;">Address: Address Province: NL</td> </tr> <tr> <td style="border: none;">City: St. John's Postal Code: X#X #X#</td> <td style="border: none;">City: City Postal Code: X#X #X#</td> </tr> <tr> <td style="border: none;">Phone: (###) ###-#### Fax:(###) ###-####</td> <td style="border: none;">Phone: (###) ###-#### Fax:(###) ###-####</td> </tr> </table>	Name: Insert Name	Name: Insert Name	Organization: Insert Name	Organization: Contractor/Employer Name	Title: Insert Name	Title: Insert Title	Address: Address Province: NL	Address: Address Province: NL	City: St. John's Postal Code: X#X #X#	City: City Postal Code: X#X #X#	Phone: (###) ###-#### Fax: (###) ###-####	Phone: (###) ###-#### Fax: (###) ###-####
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WHAT INFO	<p>To release verbally or in writing:</p> <table style="width:100%; border: none;"> <tr> <td style="width: 50%; border: none;"><input checked="" type="checkbox"/> Assessment</td> <td style="width: 50%; border: none;"><input checked="" type="checkbox"/> Participation</td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> Attendance</td> <td style="border: none;"><input checked="" type="checkbox"/> Program Dates</td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> Relevant History</td> <td style="border: none;"><input checked="" type="checkbox"/> Progress Summary</td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> End-Summary & Recommended Actions</td> <td style="border: none;"><input checked="" type="checkbox"/> Reason for Referral</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Other:</td> <td style="border: none;"><input checked="" type="checkbox"/> Treatment Plan</td> </tr> </table>	<input checked="" type="checkbox"/> Assessment	<input checked="" type="checkbox"/> Participation	<input checked="" type="checkbox"/> Attendance	<input checked="" type="checkbox"/> Program Dates	<input checked="" type="checkbox"/> Relevant History	<input checked="" type="checkbox"/> Progress Summary	<input checked="" type="checkbox"/> End-Summary & Recommended Actions	<input checked="" type="checkbox"/> Reason for Referral	<input type="checkbox"/> Other:	<input checked="" type="checkbox"/> Treatment Plan		
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<input checked="" type="checkbox"/> End-Summary & Recommended Actions	<input checked="" type="checkbox"/> Reason for Referral												
<input type="checkbox"/> Other:	<input checked="" type="checkbox"/> Treatment Plan												
PURPOSE	<p>The information I have consented to for purpose of disclosure shall only be used for the following reasons:</p> <ul style="list-style-type: none"> • To enable the Contractor to develop a return to work plan aimed at assisting me to obtain Site Access and completing and maintaining rehabilitation while working on the Site. • To assist Nalcor and the Contractor to determine whether or not I should be granted Site Access or my Site Access should be revoked. 												
CONSENT	<p>I understand that provision of treatment services is not dependent upon my decision to release information and that I may cancel this consent at any time. I also understand that some action may have been taken prior to cancellation.</p> <p>Person or Worker Signature: _____ Witness: _____ Date Signed: YYYY/MMM/DD Permission will Expire on: YYYY/MMM/DD</p>												
CANCEL	<p>I, _____, cancel this permission. I understand that some action may have been taken prior to this cancellation.</p> <p>Signature: _____ Witness: _____ Date Signed: YYYY/MMM/DD</p>												

**APPENDIX "C"
REASONABLE GROUNDS CHECKLIST**

Worker's Name: _____

Date: _____

Workplace/Project Name: _____

ID/Brass Number: _____

Put check marks against the phrases that best describe this worker's behaviour. **Add as much information as you can** that may assist in clarifying the situation, as well as any witnesses to the behaviour you are describing.

	Date(s)	Explanation
1. General Appearance <input type="checkbox"/> Sleepy <input type="checkbox"/> Tremors <input type="checkbox"/> Other (specify)		
2. Workplace Behaviour <input type="checkbox"/> Interrupts others work <input type="checkbox"/> Inflexible about procedures <input type="checkbox"/> Argumentative <input type="checkbox"/> Inappropriate emotional outbursts <input type="checkbox"/> Physically threatening <input type="checkbox"/> Alcohol or drug consumption observed		
3. Temperament at Work <input type="checkbox"/> Withdrawn much more than usual <input type="checkbox"/> Easily upset by everyday events <input type="checkbox"/> Agitated and on edge <input type="checkbox"/> Excessively worried or fearful <input type="checkbox"/> Extreme variations of mood		
4. Job Performance <input type="checkbox"/> Forgets instructions, abnormal <input type="checkbox"/> Procedures <input type="checkbox"/> Works abnormally slowly <input type="checkbox"/> Erratic productivity		

	Date(s)	Explanation
<input type="checkbox"/> Missed deadlines <input type="checkbox"/> Signs of intoxication (smell of alcohol or drugs, slurred speech, confusion, inarticulate speech, uncoordinated) <input type="checkbox"/> Poor judgment <input type="checkbox"/> Fails to wear safety equipment <input type="checkbox"/> Other (specify)		
5. Relationship with co-workers <input type="checkbox"/> Abnormal reaction to criticism <input type="checkbox"/> Imagines criticism where there is none <input type="checkbox"/> Complaint received from co-worker <input type="checkbox"/> Complaint from client		
6. Absenteeism <input type="checkbox"/> Excessive absence <input type="checkbox"/> Unlikely excuses for absence <input type="checkbox"/> Excuse for absence proven false <input type="checkbox"/> Absences follow a pattern <input type="checkbox"/> Frequently late returning from breaks <input type="checkbox"/> Excessive absence from workstation		
7. Further observations or comments: 		
Names of management or supervisory personnel trained in the Comprehensive Drug and Alcohol Work Standard or contractors policy who have completed this checklist:		
Do Reasonable Grounds for testing exist? <input type="checkbox"/> Yes <input type="checkbox"/> No If No, explain above in section #7. Supervision: _____ _____ <div style="display: flex; justify-content: space-between;"> Name (print) Signature </div>		
Do Reasonable Grounds for testing exist? <input type="checkbox"/> Yes <input type="checkbox"/> No If No, explain above in section #7. Supervisor/: Manager _____ <i>OR Designate</i> _____ <div style="display: flex; justify-content: space-between;"> Name (print) Signature </div>		

May 1, 2012 – May 1, 2017

**LOWER CHURCHILL PROJECT TRANSMISSION CONSTRUCTION
COLLECTIVE AGREEMENT**

Between

**Lower Churchill Transmission
Construction Employers' Association Inc.**

- and -

International Brotherhood of Electrical Workers

- and -

IBEW Local Union 1620

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Article 1 – Purpose and Project Culture

1.01 The purpose of this Special Project Collective Agreement (“Agreement”) is to establish certain terms and conditions of employment for workers employed by Contractors for the construction of transmission, related infrastructure and related activities for the Labrador Island Link and Muskrat Falls to Churchill Falls Project. The Parties jointly recognize that this is Newfoundland and Labrador’s Project and is of immense importance to the Provincial Energy Plan in bringing clean, renewable energy to Atlantic Canada, under the following common vision.

“Our vision is to build a strong economic future for successive generations of Newfoundlanders and Labradorians.”

1.02 The Parties agree to work collaboratively, to support positive labour relations and to utilize the International Brotherhood of Electrical Workers Code of Excellence. The Parties will work to achieve high levels of labour productivity while embracing a respectful work environment, safety, quality, efficiency and respect for the environment.

1.03 This Agreement will facilitate the participation of qualified Labrador Innu, residents of Newfoundland and Labrador, women, and members of other underrepresented groups.

1.04 The Agreement and its constituent Appendices, Recitals, Schedules, Letters of Understanding and Memoranda of Agreement shall constitute a Collective Agreement for the purposes of a Special Project Order to be declared under Section 70 of the *Labour Relations Act R.S.N.L. 1990, c. L-1* when executed by the Parties and shall be administered as such. The terms of this Agreement, including all Appendices, Recitals, Schedules, Letters of Understanding and Memoranda of Agreement, shall take precedence over any existing or future union contracts or agreements entered into by the International Brotherhood of Electrical Workers or IBEW Local Union 1620. In the event that a conflict exists between Article 1 to Article 39 of this Agreement and the Appendices, Recitals, Schedules, Letters of Understanding and Memoranda of Agreement (the “Supplementary Attachments”) to this Agreement, the applicable Article in the Agreement shall prevail unless the IBEW and Association agree in writing otherwise.

1.05 The Union, its officers and representatives at all levels, and all employees are bound to observe the provisions of this Agreement. The Association, and all Contractors, their officers, directors, representatives and employees at all levels are bound to observe the provisions of this Agreement.

Article 2 – Parties

2.01 The Parties to this Agreement shall be as follows:

- a) Lower Churchill Transmission Construction Employers’ Association Inc.;
- b) International Brotherhood of Electrical Workers; and
- c) IBEW Local Union 1620.

Article 3 – Definitions

3.01 The following definitions apply to this Agreement:

- a) “Association” means the Lower Churchill Transmission Construction Employers’ Association Inc.
- b) “Benefits Strategy” means Lower Churchill Construction Project Benefits Strategy.
- c) “Commissioning” includes pre-commissioning, static commissioning, dynamic commissioning, including work required to calibrate, test, energize or partially energize or trial equipment, processes, systems, transmission infrastructure, transition compound(s), communication systems or related infrastructure including but not limited to substations, converter stations, electrodes, transformers and synchronous condensers prior to turning all or a portion of any of the aforementioned over to the operations team or any other group designated by the Owner or EPCM responsible for start-up and operating the transmission system or any of its components.
- d) “Contractor”, “Employer” or “employer” means any contractor engaged by the Owner, or any subcontractor engaged by a Contractor, to carry out construction work at the Project, but does not include the Owner or the Owner's agent carrying out engineering, procurement, purchasing and construction management work.
- e) “EPCM” means the Owner’s Engineering Procurement Construction Management Company.
- f) “Labrador Resident” means a Canadian or landed immigrant who has, as of the date determined by the Owner or the EPCM agent of the Owner or earlier, his/her principal residence in Labrador. Factors and/or current documents to be examined when determining who is a resident may include property tax assessment, lease agreement, driver’s licence, vehicle registration, income tax returns, voter’s list registration or MCP number.
- g) “Project” means the construction of transmission, related infrastructure and related activities for the Labrador Island Link and Muskrat Falls to Churchill Falls Link, more particularly described on Schedule “A”.
- h) “Owner” means Nalcor Energy or any successor or nominee entity.
- i) “Party” or “Parties” means the party or parties to this Agreement namely the Association and the International Brotherhood of Electrical Workers and IBEW Local Union 1620.
- j) “Province” means Newfoundland and Labrador.
- k) “Provincial Resident” means a Canadian or landed immigrant who has, as of the date determined by the Owner or the EPCM agent of the Owner or earlier, his/her Principal Residence in Newfoundland or Labrador. Factors and/or current

documents to be examined when determining who is a resident may include property tax assessment, lease agreement, driver's licence, vehicle registration, income tax returns, voter's list registration or MCP number.

- l) "TFW" means Temporary Foreign Workers being workers from outside Canada who have obtained the necessary regulatory permits to work on the Project.
- m) "Union" or "Unions" shall mean the International Brotherhood of Electrical Workers and IBEW Local Union 1620.

Article 4 – Scope and Recognition

- 4.01 The Association hereby recognizes the Union as the sole and exclusive bargaining agent for the employees of Contractors as described in the classifications set out and attached hereto in Schedules "C", "C.1", "E" and "F" engaged in construction work on the Project. The Union shall represent all employees in the bargaining unit working on the Project in all matters relative to this Agreement.
- 4.02 Where the Association and/or Contractor create a new classification to be included in Schedule "C" and "C.1", the Association shall establish the classification and wage rate of the new position and the Union shall be notified in writing within 14 calendar days. The classification and wage rate shall be subject to negotiation with the Union. If no agreement is reached within 30 calendar days, the matter may be submitted to arbitration.
- 4.03 The Union recognizes the Association as the sole and exclusive bargaining agent for all Contractors engaged in the construction of the Project. All Contractors engaged in construction of the Project and having employees working within the scope of this Agreement shall be required, as a condition of contract award, to become members of the Association and to observe the terms and conditions of this Agreement.
- 4.04 This Agreement is limited to the Project. Bargaining rights and commitments under this Agreement do not in any way create bargaining rights or obligations for Contractors or Contractor employees not working on the Project, nor shall such bargaining rights or commitments be the basis of support for the creation of any bargaining rights or obligations outside the Project.
- 4.05 This Agreement does not apply to:
 - a) construction trade supervisors above the rank of foreman, those excluded under the *Labour Relations Act* of Newfoundland and Labrador, office staff, engineering staff, technical and drafting personnel, engineering surveyors, document control persons, security personnel and quality control and visual inspectors;
 - b) employees of Nalcor Energy, Emera Inc. and NSP Maritime Link Inc. or any of their subsidiaries, performing work on the Project or any portion of the Project;
 - c) persons engaged in the supply, installation, termination and testing of the Marine HVDC cable system crossing the Strait of Belle Isle, including but not limited to associated work from the cable system components in the Transition Compound at Forteau, Labrador, to cable system components in the Transition Compound

at Shoal Cove, Newfoundland. This work includes but is not limited to persons engaged in the supply and installation of surge arrestors, terminations, fibre optic system, HVDC cable accessory and spares, land HVDC cable, engineered thermal backfill, transition joint bays, horizontally drilled cable conduits, HVDC marine cable, submarine berm, operation of rock quarry and transportation of materials from such rock quarry;

- d) work performed by any person within the scope of work which falls under a different Special Project Order issued pursuant to Section 70 of the *Labour Relations Act*.
- 4.06 It is understood and agreed by the Parties hereto that no bargaining relationship is created or will be created at any time during the term of this Agreement or any extension of the term of this Agreement by the Owner or the Owner's Engineering Procurement Construction Management ("EPCM"), or their subsidiaries and affiliates and their successors with the International Brotherhood of Electrical Workers or IBEW Local Union 1620 or any affiliates of either union, by voluntary recognition or by action of law pursuant to the *Labour Relations Act* of the Province of Newfoundland and Labrador or by any other means. Accordingly this Agreement does not apply to the Owner or EPCM, their subsidiaries, affiliates and their successors or to the employees of any of the aforementioned. Accordingly, an arbitrator shall have no authority or jurisdiction to make any order or award any remedy against the Owner or the EPCM, their subsidiaries, affiliates and their successors or to any employees of the aforementioned.
- 4.07 The Association shall designate, in writing, one or more Project representatives with full authority to administer the terms of this Agreement. The Union agrees to recognize said representatives and their authority to carry out those duties. There shall be at least one Association Project representative as an ex-officio member of all joint committees. Should the Association change any of its designated Project representatives, it shall inform the Union of such change in writing.
- 4.08 The Union shall designate one or more Project representatives, in writing, with full authority to administer the terms of this Agreement. The Association agrees to recognize said representatives and their authority to carry out their duties. There shall be at least one Union Project representative as an ex officio member of all joint committees. Should the Union change any of its designated Project representatives, it shall inform the Association of such change in writing.
- 4.09 The Contractor(s), the Union or any member of the bargaining unit shall not seek to agree, or agree on any matter, within the scope of this Agreement or as to the interpretation of this Agreement or application of this Agreement except as provided in this Article. Any agreement on any matter within the scope of this Agreement or any agreement as to the interpretation of this Agreement shall be null and void and not enforceable except as provided in the herein Article. Only the Association and the Union may, by written agreement signed by the duly authorized representative of each Party, amend the terms of this Agreement or enter into agreement as to the interpretation or application of this Agreement.
- 4.10 The International Brotherhood of Electrical Workers and IBEW Local Union 1620 jointly and severally agree with the Association and with each other that during the term of this Agreement, and any extension to the term of this Agreement, they will continue to be the

bargaining agent for all employees who come within the scope of this Agreement and they agree during the term and any extension to the term not to seek to bargain individually with any Contractor to be governed exclusively by the terms of this Agreement and by all lawful settlements of disputes, grievances and differences made pursuant to the terms of this Agreement.

- 4.11 The Parties agree that the Innu Liaison position is not a representative of the Union, Contractors, or Association and is not included in the bargaining unit.

Article 5 – Management Rights

- 5.01 The Contractors retain full and exclusive authority for the management of their business in all respects, subject to the provisions of this Agreement.
- 5.02 Without restricting the generality of the foregoing, it is agreed that it is the exclusive function of the Contractors:
- a) to determine qualifications, skills, abilities and competency of employees;
 - b) to determine the required number of employees;
 - c) to hire, transfer, select, assign work, monitor and manage productivity, promote, demote, lay-off, discipline and discharge employees for just cause and to increase or decrease the working force from time to time;
 - d) to determine productivity levels, job competence, materials to be used, design of products, facilities and equipment required, to prescribe tools, methods of performing work and the location of equipment, the location work is to occur, and the scheduling of work; and
 - e) to establish, implement, monitor and enforce policies, procedures, rules and regulations to be observed by employees, and non-compliance may involve discipline, including dismissal.

Article 6 – Union Security

- 6.01 The Association, Contractors and the Union agree that regardless of whether an employee applies for membership in the Union, the Union shall represent all employees in the bargaining unit working on the Project in all matters relative to this Agreement.
- 6.02 The Contractor agrees to deduct from the earnings of all employees covered by this Agreement union dues and assessments (“Union Dues and Assessments”) as a condition of employment, in an amount as directed by the Union from time to time.
- 6.03 The Contractor agrees to provide an authorization form furnished by the Union to the employee for signing, authorizing the Contractor to deduct and remit the Union Dues and Assessments to the Union. Any employee who refuses or neglects to sign the appropriate authorization form(s), or who revokes the authorization, will be deemed to have forfeited his/her right to employment on the Project and will be deemed to have voluntarily resigned.

- 6.04 The Contractor shall deduct the Union Dues and Assessments and forward such monies to the Union on or before the fifteenth (15th) day of the following month. When remitting Union Dues and Assessments the Contractor shall provide the name, address and classification of each employee from whose pay such deductions have been made.
- 6.05 The Union shall save the Association and Contractor harmless from any and all claims that may be made against the Contractor for amounts deducted and remitted to the Union in accordance with this Article 6.
- 6.06 Initiation fees for employees who apply for and are granted membership in the Union will be deducted from employee's first pay unless directed otherwise by the Union.
- 6.07 The Association, Contractors and the Union agree that initiation fees, union dues, assessments and other fees or costs related to union representation of bargaining unit employees and/or union membership must be reasonable.
- 6.08 The Contractor shall not discriminate against any employee by reason of membership in the Union.
- 6.09 The Parties agree that Local Union and International Representatives designated in writing to the Association may have reasonable access to work sites on the Project to conduct Union business. Local Union and International Representatives shall be subject to all Contractor and Association policies, procedures, standards and regulations applicable to site access. Prior arrangements for site access will be made with the Union and Association site representatives. The Contractor and Association shall be given reasonable notice of the site visit which shall in no way interfere with the progress of work.

Article 7 – Hiring Provisions

- 7.01 The Parties agree that creating a sustainable, flexible and scalable workforce will benefit the Union and ensure there is a significant workforce in Newfoundland and Labrador with the ability to obtain workers from Atlantic Canada and other parts of Canada to support Project needs.
- 7.02 The Parties agree to ensure compliance with the Gender Equity and Diversity obligations regarding hiring of females and persons from underrepresented groups, as specified by the Benefits Strategy or any employment equity plan that may be applicable to the hiring of qualified Labrador Innu, to hire in the following order of priority:
- a) Qualified Labrador Innu for construction of the Labrador portion of the Project that includes all transmission and associated work between Churchill Falls and the Labrador side of the Strait of Belle Isle (all Project work in Labrador).
 - b) Qualified residents of Labrador for construction and/or modification of the Labrador portion of the Project that includes HVac transmission system and associated infrastructure as determined by the Association in consultation with the Union between Muskrat Falls and Churchill Falls.
 - c) Qualified residents of Newfoundland and Labrador.

- 7.03 In order to meet the obligations applicable to the hiring and retention of qualified Labrador Innu and obligations contained within the Benefits Strategy, the Parties agree that all Project partners, including Contractors, the Union and the Association will work proactively and progressively to advance the participation and integration in the areas of employment, training and apprenticeship for all employees/groups under Article 7.02 above.
- 7.04 After employment priority is given to comply with the obligations contained in Articles 7.02 and 7.03, the Parties are committed to work cooperatively to identify, recruit, refer and hire workers in the following order of priority:
- a) Qualified Canadian workers who are members of IBEW affiliate locals
 - b) Qualified Canadian workers
 - c) Temporary Foreign workers being qualified non-Canadian workers that are members of IBEW affiliate Locals and who are authorized to enter and work in Canada.
 - d) Temporary Foreign Workers being other qualified non-Canadian workers who are authorized to enter and work in Canada.
- 7.05 All workers hired, pursuant to Article 7.02, 7.03 and 7.04, shall be represented by the Union and pay initiation fees, dues or other assessments upon and after hiring as per Article 6.
- 7.06 The Parties agree that should Temporary Foreign Workers be required for employment on the Project the following will apply:
- a) Temporary Foreign Workers will be initially accessed from the hiring halls of IBEW local affiliates of American Unions. If such unions cannot supply Temporary Foreign Workers within two (2) weeks from receipt of the request, such Temporary Foreign Workers may then be accessed from other sources.
 - b) Temporary Foreign Workers employed by Contractor(s) on the Project shall have a minimum period of employment of six (6) months, and shall be permitted mobility from one Contractor to another Contractor on the Project, subject to work availability and there are no qualified residents of Newfoundland and Labrador and other qualified citizens available to work at the time the Temporary Foreign Workers are hired.
 - c) Temporary Foreign Workers will be subject to the same financial and other terms and conditions of this Agreement as Canadian workers, with the exception of, if necessary, adjustment to the financial allocation of benefits, provided that there is no change to the gross hourly rate.
- 7.07 The International Brotherhood of Electrical Workers and/or IBEW Local Union 1620 will fully cooperate in the Temporary Foreign worker application process, including the execution of any documents that are reasonably necessary to support an application for utilization of Temporary Foreign Workers to Human Resource and Skills Development Canada or any other regulatory agency. All reasonable costs associated with

Temporary Foreign Worker applications will be paid by the Association and/or Contractor(s).

7.08 Except as provided in Schedules "E" and "F" attached hereto and forming part of this Agreement, the Parties agree that the Contractor(s) shall, per contract, adhere to the following hiring procedure:

- a) Name hire or select all working or non-working forepersons from the Union out-of-work list;
- b) The first worker shall be appointed by the Union as the Shop Steward, with the next six (6) workers being name hired or selected by the Contractor from the Union out-of-work list;
- c) Name hire or select new hires, with the Union referring the eighth worker, the Contractor name hiring or selecting the next worker, and so on thereafter. The Shop Steward(s) will be appointed from the Union referrals.
- d) All workers name hired, or selected by the Contractor(s) or referred by the Union to work on the Project must be in possession of a Union clearance card from the Union when reporting for work. The Union shall provide clearance cards in a timely and efficient manner.

7.09 a) The Parties agree that highly qualified supervision is fundamental to the success of the Project, therefore the following will apply:

- i. Forepersons will be selected or name hired after having received pre-employment multi-faceted training including, but not limited to, site and collective agreement orientation and training, safety, environment, IBEW Code of Excellence, cultural and gender sensitivity, mentoring and coaching, work scheduling and budgeting, respectful workplace, labour relations dispute resolution pursuant to the agreement, communication skills, productivity, leadership, team building, management and maintaining schedule in advance of coming to work so they have the skills and tools to succeed.
- ii. Forepersons may be hired without having received the training described in Article 7.09(a) (i) above in which case such forepersons shall receive the training within two (2) months after being hired.
- iii. The Contractor may promote a journeyman to the position of foreperson. Within two (2) months after the appointment, such foreperson shall receive the training set out in 7.09 (a) (i) above.
- iv. The designation and determination of the number of forepersons is the responsibility of the Contractor. The foreperson may be a working foreperson for crews of ten (10) or less workers and use the tools of the trade, taking into account safety, productivity and efficiency with the exception of safety sensitive hotline work and dressing tower work where the foreperson may be a working foreperson for crews of five (5) or less employees and use the tools of the trade.

- v. The selection of foremen must be in alignment with the Benefits Strategy and Gender Equity and Diversity objectives established in consultation with the Province.
- b) The Parties agree that it is fundamental to the success of the Project to have highly trained employees, and accordingly agree to the following:
 - i. Workers will be selected or name hired by the Contractor and/or referred by the Union from a group of workers that have received pre-employment multifaceted orientation and training, including, site and collective agreement orientation, safety, environment, IBEW Code of Excellence, cultural and gender sensitivity, respectful workplace, dispute resolution pursuant to the Agreement and productivity, so that such employees have the skills and tools to succeed.
 - ii. In the event that no qualified workers described in 7.09 b) i) are available, workers may be selected or name hired from a group that have not received the pre-employment orientation and training. In which case, such workers shall receive the orientation and training prior to commencing work on the Project.
 - c) The parties will collaborate to identify and access available funding for the purposes of developing and delivering pre-employment training as contemplated by 7.09(a)(i) and 7.09(b)(i). In the event that funding is not available to cover the full cost, any financial shortfall will be the responsibility of the Association and/or Contractor. The Union may contribute resources to assist in these important training initiatives and will be reimbursed on a cost basis.
- 7.10
- a) The Parties hereto agree that the Union list of qualified workers referred to herein is reference to those forepersons and workers who have applied to the Union and/or the Association and have been approved by the Union and Association for employment opportunities on the Project and have received the pre-employment orientation and training pursuant to Article 7.09(a)(i) and/or Article 7.09(b)(i). If there is a dispute as to whether or not a person is approved to be on the Union list of qualified workers for purposes of this Agreement, the Union and the Association/Contractor agree to meet expeditiously to discuss and use reasonable good faith efforts to resolve the dispute. If the dispute is not resolved such dispute may be referred by either the Association or Union to a panel pursuant to Article 7.10(b), (c), and (d).
 - b) This panel shall consist of three persons, who shall serve for the duration of the Project. In the event that any one of the panelists can no longer serve, for whatever cause, the Parties agree to forthwith replace their nominee or to agree to the independent third party (“ITP”). If the Parties cannot agree to an ITP, they shall apply to the Minister of Labour, Government of Newfoundland and Labrador, for the appointment of the ITP. The panel shall consist of three persons:
 - i. One appointed by the Association;
 - ii. One appointed by the Union;

- iii. An ITP who is neither a lawyer nor an arbitrator under this Agreement.
 - c) Decisions of the Panel, by agreement of the Parties, shall be final, binding and not subject to the arbitration process herein, appeal, judicial review or any other form of judicial intervention.
 - d) Decisions of the Panel shall be made on an expedited basis:
 - i. Any dispute as to whether or not a person is approved to be on the Union list of qualified workers for the purposes of this Agreement will be referred in writing to the Panel within seven (7) days of the dispute arising. The referral must itemize the issues in dispute, including the reasons why the disputing party claims the person should be approved to be on the Union's list of qualified workers.
 - ii. All referrals to the Panel will be heard within seven (7) days of such written referral. Notice of the referral shall be provided to all affected Parties by the referring Party. Each Party shall have the right to present evidence and make representations to the Panel, which presentation of evidence and/or making of representation shall be limited to one (1) hour unless such period is extended by a majority of the Panel. The Panel will render its decision within forty-eight (48) hours of the completion of the hearing. All decisions must be by a majority of the Panel.
- 7.11 If the Union is unable to supply the workers required within four (4) days from the date requested, exclusive of Saturdays, Sundays and holidays, the Contractor may hire from other sources. Each worker hired from other sources will be governed by the terms and conditions of this Agreement.
- 7.12 The Union recognizes the Contractor's right to evaluate employees to determine their level of competency, skill, ability, level of productivity and efficiency and qualifications to perform the work required.
- 7.13 The Parties agree to the following:
- a) Employees shall be required to undergo a pre-employment medical examination or a pre-employment assessment to determine if such employee is fit to perform the applicable work. The Contractor and/or Association, in consultation with the Union, will determine the criteria for such medical examination or assessment to be performed by a physician or other qualified healthcare professional, as named by the Association.
 - b) Any employees, who have been laid off from the Project for a six (6) month period, or more, shall be required to undergo a pre-employment medical examination or pre-employment assessment to determine if such employee is fit to perform the applicable work.
 - c) Where it is not practical for a prospective worker to report to a physician or such other qualified healthcare professional named by the Association, the Association or Contractor may require the prospective worker to report to another physician

to receive a pre-employment medical examination, in accordance with the criteria determined pursuant to Article 7.13(a), above.

- d) The Association or Contractor shall pay the reasonable costs for the physician or such other qualified healthcare professional authorized by the Association or Contractor to perform the pre-employment medical examination or pre-employment assessment.
- 7.14 The Parties agree that employee(s) employed on the Project that is being laid off from one Contractor may be hired by another Contractor subject to the following:
- a) the Contractor has work available for the employee; and
 - b) the Union has no other qualified workers on the Union out-of-work list at the time of layoff who has received the pre-employment training and orientation required for the Project.
- 7.15 Once employed on the Project, an employee, subject to the Contractor's approval, shall be permitted mobility from one contract job to another contract job within the Project as long as they continue on the payroll of the same Contractor without interruption of earnings at or about the time of change.
- 7.16 Once an employee working on the Project resigns his or her employment with a Contractor, such employee will not be permitted to work on the Project for ninety (90) days from the date such employee ceased to be employed, unless the ninety (90) day period is waived by the Association after consultation with the Union.
- 7.17 In the event that an employee is terminated or suspended for cause, such employee will not be name hired, selected or referred to the Project, except by agreement of the Parties or in the event the termination is set aside and a lesser penalty is imposed or the suspension has been served. After any suspension imposed or upheld is served, such employee may be name hired, selected or referred to the Project.

Article 8 – Access to Site

- 8.01 Notwithstanding any provision herein, vehicles transporting or delivering materials, modules, goods and/or supplies to and from the Project, which are not operated by members of the bargaining unit, shall be permitted to drop off or pick up at multiple locations on the Project at or near the point of installation, use, marshaling or such other area(s) as directed by the Contractor. Any module, materials, goods or supplies transported to the Project requiring specialized delivery may be delivered from its point of deportation to its point of installation, use, marshaling or any other area(s) as directed by the Contractor by personnel who are not members of the bargaining unit. Vehicles picking up or delivering garbage containers, courier packages, mail, food or other materials at multiple locations on the Project may be operated by persons who are not members of the bargaining unit. No bargaining unit member will be required to accompany the driver of such vehicles or equipment.
- 8.02 Fueling of vehicles or equipment may occur or be done as required by the Contractor. Transportation of fuel, fueling of vehicles and/or fueling of equipment on the Project may be performed by persons who are not members of the bargaining unit.

- 8.03 Warranty work may, at the Contractor's discretion after consultation with the Union, be performed at any location on the Project by persons who are not members of the bargaining unit.
- 8.04 Specialized work or work requiring proprietary technology, as determined by the Association after consultation with the Union, to be performed on the Project, may at the Contractor's discretion, be performed at any location on the Project by persons who are not members of the bargaining unit.
- 8.05 Repair work or maintenance work on any vehicles or equipment on the Project may, at the Contractor's discretion, be performed at any location on the Project by persons who are not members of the bargaining unit. Maintenance preservation work on equipment and/or modules on the Project prior to commissioning may, at the discretion of the Association/Contractor, be performed at any location on the Project by persons who are not members of the bargaining unit.

Article 9 – Security and Site Regulations

- 9.01 The Association and Contractor(s) may initiate appropriate measures, including the establishment of rules, policies, procedures and regulations to safeguard the Project or any portion of the Project or the area of the Project controlled by the Contractor and to govern the behaviour and conduct of all persons therein. This right should not be interpreted in any way to restrict the Owner's ability to make rules, procedures, standards or regulations for the Project or any portion of the Project.

Article 10 – Health and Safety

- 10.01 The Parties acknowledge that health and safety is a shared responsibility for every person participating in the Project. The parties acknowledge that a "safety first" culture and a healthy work environment will be the foundation of a successful Project.
- 10.02 All work shall be performed in accordance with the *Occupational Health and Safety Act* and in compliance with all Project Health and Safety regulations, rules, policies, standards or procedures a copy of which shall be provided to the Union. The Parties recognize that it is the responsibility of everyone to cooperate in the reduction of risk and exposure with the objective of eliminating accidents, health and safety hazards and advocating observance of all safety rules, standards, procedures, regulations and policies.
- 10.03 The Parties acknowledge and recognize the mutual value of improving, by all proper and reasonable means, the health and safety of the employees and will co-operate to promote health and safety.
- 10.04 The Contractor(s) may provide, where appropriate, upon commencement of employment, specific articles or equipment for use by employee(s) during the course of employment on the Project.
- 10.05 Where the Contractor determines after an employee has been hired that the nature of the work for working conditions will require, employees shall be supplied, at the Contractor's expense, all necessary safety equipment and/or devices to enable the employee to safely perform his/her duties. Employees shall be required to use safety

equipment and/or devices in accordance with the intended use. Notwithstanding the foregoing, the Contractor shall provide to each employee upon commencement of employment, the following specific articles for use by the employee in the course of their employment on the Project:

- i. one (1) safety hat colour coded for identification together with a winter liner;
- ii. one (1) pair of non-prescription safety glasses;
- iii. one (1) safety vest;
- iv. appropriate work gloves;
- v. rain gear (jacket and pants) and protective clothing (including rubber boots) when the nature of the job requires such clothing; and
- vi. such equipment shall be of reasonable quality, fit and size for the employee.

10.06 All such equipment or articles provided under Article 10.04 and 10.05 hereof shall remain the property of the Contractor. It shall be the responsibility of the employee to care for the articles and equipment provided. Should the articles or equipment be rendered unsafe for use due to normal wear and tear during employment, the Contractor shall replace the articles by exchange upon return by the employee. The employee shall be responsible to return such equipment or articles in good working order (subject to reasonable wear and tear) at the end of an employee's employment. Failure to return such equipment or articles shall result in their cost being charged to the employee(s), which the Contractor may deduct from the employee's wages.

10.07 All personal protective equipment, whether employee or Contractor supplied, shall be Canadian Standards Association (CSA) approved.

10.08 The employee shall be responsible to provide his/her prescription safety eyeglasses; however, where an employee's prescription safety eyeglasses are accidentally damaged or broken, in the course of the performance of their duties, the Contractor agrees to pay up to a maximum cost of two hundred and fifty dollars (\$250.00) per employee for the life of the Agreement, to have prescription safety eyeglasses repaired or replaced, at the option of the Contractor (Subject to acceptable verification of the cost of repair or replacement being provided to the Contractor).

10.09 The employee, except as otherwise provided for in this Agreement, shall be responsible to provide his/her personal safety footwear which is suitable for their work environment. Safety footwear shall meet CSA standards and be a type appropriate for their normal work duties and conditions.

10.10 The Joint Occupational Health and Safety Committees shall be established at the Project or an area of the Project in accordance with the Occupational Health and Safety Regulations. The frequency of meetings will be determined by the Committee itself, but no fewer than the number required by the *Occupational Health and Safety Act*. All

employees on the Committee shall receive, without loss of earnings, all training necessary to carry out their duties.

10.11 The Parties agree to comply with the *Workplace Health, Safety and Compensation Act* of the Province of Newfoundland and Labrador.

10.12 The Contractors, IBEW and bargaining unit members agree to comply with the obligation to participate in job observations and investigations.

Article 11 – Human Rights

11.01 The Parties agree to comply by the Newfoundland and Labrador *Human Rights Act*.

11.02 The Parties agree that there will be no contravention of this Agreement by the Contractor, Association or Union as a result of the Contractor complying with all obligations that benefit the Labrador Innu in this Agreement including but not limited to hiring priority, retention priority, cultural leave benefit or any other benefits or provisions.

Article 12 – Diversity and Gender Equity on the Project

12.01 The Association, its Contractor members and the Union will promote and support Gender Equity Programs and Diversity Programs established in accordance with the Benefits Strategy and programs established in order to support the training, hiring and retention of Labrador Innu. The parties to this Agreement recognize and support the principles of diversity in employment and gender equity in the workplace, and will work cooperatively to create a respectful and inclusive work culture.

12.02 The Association, its Contractor members and the Union will support the Lower Churchill Project Gender Equity and Diversity Program and the participation goals for women and underrepresented groups established in consultation with the Province.

Article 13 – Strikes and Lockouts

13.01 The Association, its Contractor members, the Union and the bargaining unit members agree that maintaining a positive work environment based on trust, respect and accountability is essential to the Project success and there shall be no labour disputes. The Association, its Contractor members, the Union and the bargaining unit members agree to the following:

- a) During the life of this Agreement there shall be no lockout by the Association or Contractors and there shall be no strike on the part of the Union or bargaining unit members. Strikes and lockouts shall have the meaning defined in the Newfoundland and Labrador *Labour Relations Act* and shall include, but not be limited to, work slowdowns or any other concerted activity designed to restrict or limit productivity or to support, encourage, condone or engage in concerted activities such as strike, work stoppage, picketing or organized slow-downs intended to restrict or limit productivity that affects any aspect of the worksite.
- b) If after an investigation has been completed, which investigation shall include consultation with the Union, the Association or Contractor determines that an employee(s) has instigated an illegal strike contrary to Article 13.01(a), such

employee(s) shall be terminated and shall not be name hired, selected or referred by the Union, the Association or any of its Contractor members to the Project. Should such termination be grieved and subsequently arbitrated, the Parties agree that should an arbitrator determine that a violation of Article 13.01(a) has occurred, the arbitrator shall have no jurisdiction to substitute a lesser penalty.

- c) If after an investigation has been completed, which investigation shall include consultation with the Union, the Association or Contractor determines that an employee(s) has participated in an illegal strike contrary to Article 13.01(a) such employee(s) shall be subject to disciplinary action up to and including termination and, where terminated, shall not be referred by the Union, the Association or any of its Contractor members to the Project. Should such discipline be grieved and subsequently arbitrated, the Parties agree that should an arbitrator determine that a violation of Article 13.01(a) has occurred, the arbitrator shall have no jurisdiction to substitute a lesser penalty, except in the case of exceptional mitigating circumstances.

Article 14 – Liaison Committee

14.01 The Association, its Contractors and the IBEW agree to the following:

- a) Provide strong leadership in both the Association and IBEW in dealing with all work place issues and disputes.
- b) Commit to dealing with work related issues or disputes on the Project in a timely and collaborative manner with minimal impact to the working environment.
- c) Administering the grievance and arbitration process in a way that adheres to the above principles and ensures grievances and arbitrations are dealt with in a timely and collaborative manner with minimal impact on the progress of work.

14.02 Both the Association and IBEW agree to form a Liaison Committee to work collectively to achieve the following:

- a) Promote and maintain a safety first and healthy work environment;
- b) Adhere to Article 14.01 above;
- c) Promote and maintain open and respectful communication in regard to all matters pertaining to the Project or the Agreement;
- d) Maximize productivity to ensure completion on or ahead of schedule;
- e) Foster and maintain proactive and positive industrial relations;
- f) Speedy resolution of disputes or issues arising under the Agreement; and
- g) Address matters of mutual interest pertaining to the Project or this Agreement.

- 14.03 The Liaison Committee shall maintain a maximum of five (5) and a minimum of three (3) representatives of the Association and a maximum of five (5) and a minimum of three (3) representatives of the Union with the Chairperson alternating between a Union representative and Association representative. The Association shall appoint a designated Association Site Representative who shall be responsible for recording and distributing the minutes of all meetings. At any meeting of the Liaison Committee, each of the Association and the Union shall be entitled to cumulative representation equal to the number of representatives present from the other Party. Each Party shall notify the other in writing of its designated representatives on the Liaison Committee.
- 14.04 A meeting of the full Liaison Committee shall occur once every three (3) months or more often, if necessary, on written consent of the Parties. Each Chairperson shall submit to the designated Association Site Representative a list of agenda items to be discussed. The designated Association Site Representative shall prepare the agenda and distribute the agenda to the Committee members prior to the meeting.
- 14.05 The Liaison Committee may create a subcommittee for more frequent meetings for any specific geographical area of the Project or specific scope of work. The Union and the Association will appoint representatives to be members of the subcommittee. A meeting of the subcommittee of the Liaison Committee may occur monthly or more often if necessary on written consent of the Parties.
- 14.06 Any union representative appointed to serve on the Liaison Committee or Sub-Committee, who is an employee under this Agreement, will be given leave with pay, which leave shall be subject to Contractor approval, which approval will not be unreasonably withheld, to attend meetings which take place during the employee's regularly scheduled work hours.

Any employee / Union member not a representative of the Liaison Committee, required to attend a Liaison Committee or sub-committee meeting, will be given leave with pay, which leave shall be subject to Contractor approval, which approval will not be unreasonably withheld, to attend meetings which take place during the employee's regularly scheduled work hours.

Article 15 – Grievance and Arbitration

- 15.01 The purpose of this Article is to establish a procedure for the discussion and prompt resolution of grievances concerning a disciplinary measure for other than just and reasonable cause, or a dispute arising out of the interpretation, application, administration, or alleged violation of this Agreement.
- 15.02 All grievances shall be adjusted in accordance with the following procedures:
- a) **PRE-GRIEVANCE:** Complaints must be taken by the employee(s), accompanied by the shop steward if they so desire, to the employees non-union supervisor to discuss and, if possible, to resolve within two (2) days after the circumstances giving rise to the complaint have occurred or within two (2) days of the employee becoming aware of such circumstances. Such resolution of the complaint shall not contravene the terms and conditions of this Agreement but is solely for the purpose of resolving the matter and shall not be considered as precedential or binding in any other grievance dispute.

- b) **STEP 1:** Any complaint discussed under 15.02(a) that is not satisfactorily resolved by the employee, steward and supervisor may become a grievance and shall be reduced to writing and provided to the supervisor within five (5) days after the circumstances giving rise to the complaint have occurred or within five (5) days of the employee becoming aware of such circumstances. The supervisor shall render his/her decision, in writing, within three (3) days of his/her receiving the written grievance. The written grievance shall state the alleged violation, the date of the violation, the facts describing the alleged violation, the location of the violation, the person or entity committing the violation, the Article or Articles of the Agreement alleged to have been violated and the remedy sought.
 - c) **STEP 2:** Should the written decision rendered in Step 1 be unsatisfactory to the employee, or should no decision be rendered, the employee assisted by his/her steward, shall submit the written grievance within a further two (2) days to the Association and the Contractor's designated representative on the Project. The Association, Contractor, and Union representative(s) and the employee, assisted by the shop steward, shall meet within five (5) days to discuss the matter. Prior to the second step meeting, the Association and Union commit to engage in a joint fact finding exercise with a view of developing a common understanding of the facts surrounding the dispute, to better position the Parties to resolve such dispute. The Contractor shall render a decision in writing within one (1) day of the second step meeting. If such a meeting is not held the matter shall be referred to Step 3.
 - d) **STEP 3:** Should the decision rendered at Step 2 be unsatisfactory, within two (2) days of the decision, the Contractor, the Association and the Union representatives shall meet to discuss the matter. If no resolution can be achieved within two (2) days either the Union or the Association may, within five (5) days of the meeting, refer the matter to arbitration in accordance with the procedure contained herein. If such meeting is not held, the matter may be referred by either the Union or the Association to the next step, arbitration.
- 15.03 The Contractor shall provide the Union with a copy of any written disciplinary action taken against an employee.
- 15.04 In the case of discharge or suspension:
- a) An employee who is discharged shall be notified in writing by the Association/Contractor and a copy will be forwarded to the Union. Such notice will state the reasons for discharge. If the employee considers they have been discharged for other than just cause, they may, within three (3) days of receipt of the discharge notice, file a written grievance commencing at Step 3 of the grievance procedure.
 - b) An employee who receives a disciplinary suspension shall be notified in writing by the Association/ Contractor and a copy will be forwarded to the Union. Such notice will state the reasons for the discipline. If the employee considers that they have been disciplined for other than just cause, they may file a written grievance commencing at Step 2 of the grievance procedure.

- 15.05 The Association or Contractor may file a grievance, in writing, with the Union within five (5) days after the circumstances giving rise to the grievance have occurred or originated or within five (5) days of the Association or Contractor becoming aware of such circumstances. The Union may file a grievance, in writing, with the Association within five (5) days after the circumstances giving rise to the grievance have occurred or originated or within five (5) days of the Union becoming aware of such circumstances. If such grievances are not resolved within two (2) days, the grievance may be treated as a grievance commencing at Step 3, and may be referred to arbitration in the same manner as an employee's grievance.
- 15.06 The appointment of an arbitrator will be made within four (4) days of a referral to arbitration under Step 3. The arbitrator shall be selected in rotation from the list of six (6) arbitrators as set out in Schedule "D" attached to and forming part of this Agreement. The list shall be reviewed and may be updated by mutual agreement of the Parties once every year during the term of this Agreement. Should the arbitrator whose turn it is be unable to act within the time requirements delineated in this Article, he/she shall be passed over to the next person on the list, and so on.
- 15.07 The arbitrator shall, within twenty (20) days of his/her appointment, convene an arbitration hearing to hear the relevant evidence. All rulings will be given by the arbitrator within fifteen (15) days of the conclusion of the hearing. The decision of the arbitrator shall be final and binding on the Parties.
- 15.08 The arbitrator shall be governed by the following provisions. The arbitrator:
- a) Shall have jurisdiction and authority only to interpret and apply the provisions of this Agreement so far as shall be necessary for the determination of the grievance, including remedies, but shall not have the power to alter, add to or amend any of the provisions of this Agreement.
 - b) Shall have the authority to review and modify any penalty imposed by the employer and, in the case of discharge of an employee, substitute such other penalty as deemed just and reasonable in the circumstance, except as may otherwise be provided in this Agreement.
 - c) Shall determine whether a grievance is arbitrable.
 - d) Shall have access to the worksite to view site facilities, ongoing construction work, installation of equipment and/or machinery, and other working conditions, which may be relevant to the resolution of the grievance.
 - e) Shall determine the procedure and shall give full opportunity to both parties to present evidence and make representations.
 - f) Shall not dismiss any grievance on a technicality or error on the grievance form.
- 15.09 In the interest of providing speedy resolution to grievances, arbitration hearings may be conducted by video and/or telephone conference call unless mutually agreed otherwise, with the Association and the Union representatives or their designated respective legal counsel(s) acting as presenters.

- 15.10 The time limits specified in Article 15.02(a), (b), (c) and (d) above are mandatory. The Parties may, by mutual consent in writing, extend the time limits of this grievance and arbitration procedure. Failure of a party to file a grievance or failure of the grieving party to advance a grievance to the next step, within the time limits, shall constitute abandonment of the grievance.
- 15.11 The Contractor/Association and Union involved in arbitration agree that the fees and expense of the arbitrator will be paid in accordance with the following:
- a) In the event the arbitrator makes a determination that there is a losing party or parties, an arbitrator may order the losing party or parties to pay the arbitrator's fees and expenses.
 - b) In the event the arbitrator makes no order as to the payment of fees and expenses, each of the party or parties shall pay an equal share of the fees and expenses of the arbitrator.
- 15.12 Where an employee is required to attend an arbitration to give evidence on a day that they are scheduled to work, the Contractor shall provide the employee, upon request, with leave to attend the hearing and the party requiring the employee's attendance shall be responsible to pay the employee's lost wages.

Article 16 – Shop Stewards

- 16.01 Stewards shall be appointed by the Union Business Manager or his/her representative. Gender Equity and Diversity shall be considerations in the appointment of stewards. When a scheduled second and/or third shift occurs, stewards for such shift(s) may be appointed. Such appointments shall be confirmed in writing to the Contractor and the Association. Stewards assigned to represent a particular shift will not retain their status if that shift is cancelled.
- 16.02 This Article 16 does not affect a Contractor's right to determine where and when employees work or what shifts they work on.
- 16.03 Stewards shall not be discriminated against in the performance of union duties. The steward will notify and obtain permission from his/her immediate supervisor before leaving his/her work location to deal with any matter relating to this Agreement, which permission will not be unreasonably denied.
- 16.04 There shall be no non-working stewards. Subject to Article 16.03 above, stewards will be granted sufficient time to conduct their legitimate union duties during working hours. All union duties performed during working hours shall be at the steward's regular rate of pay. Stewards will not be paid for duties performed outside of their regularly scheduled work hours.
- 16.05 Stewards shall be the last employee laid off where the steward has the skill, ability and competency to perform the required work.
- 16.06 Stewards shall receive pre-employment training in the Code of Excellence.

16.07 When five (5) or more employees / union members are required to work overtime, a shop steward qualified to perform the work will be part of the five (5) or more overtime crew working the overtime.

Article 17 – Maximize Productivity

17.01 The Parties agree that obtaining high standards of labour productivity will be a key factor for the Project success. Accordingly, given the importance of the Project to the people of Newfoundland and Labrador, the Association, its Contractor members, the Union and the members of the bargaining unit will take affirmative steps to ensure productivity opportunities are identified and maximized. The Union and the members of the bargaining unit agree to cooperate in the implementation of productivity improvement initiatives.

Article 18 – Work Teams

18.01 The Association, Contractor(s), and the Union agree that the utilization of cross functional Work Teams and a team based approach is essential to the Project success, providing maximum productivity and flexibility for the efficient and effective performance of work completed on time and within budget.

18.02 The Association, Contractor(s) and the Union agree that Work Teams will be composed of different worker classifications, with the necessary skills and qualifications required to perform and complete the work assignment(s). The creation of any specific Work Team shall not prohibit or restrict a Contractor from creating a Work Team for the same, or different, type of work with a different composition of classifications or workers.

18.03 Work Teams will be under the direction of a foreman or supervisor, as determined by the Contractor, who shall have authority for the direction and control of the work of the Work Team and will act as a liaison between the Work Team and other aspects of the Project.

18.04 Employees are required to take ownership of the Work Team concept and team based approach and shall perform all work assignments provided they are qualified to perform such work safely.

Article 19 – Hours of Work, Work Schedules and Overtime Provisions

19.01 The Association, Contractors and Union agree that given the different types of work, the composition of the workforce, the variety of weather conditions and the varied geographical areas of the Project, work schedules and hours of work will require a high level of flexibility and will vary for different parts of the Project.

Regular Work Schedule and Overtime Provisions

19.02 This Article is intended to identify regular hours of work, Regular Work Schedules and overtime hours:

- a) The Regular Work Schedule shall consist of forty (40) hours of work divided into five (5) consecutive eight (8) hour work days from Monday to Friday, or four (4) consecutive ten (10) hour work days from Monday to Thursday, at the option of

the Contractor. The start time for the day shift for a regular work day will be between 5:00 a.m. and 9:00 a.m.

- b) Overtime shall be paid as follows for a work week consisting of five (5) consecutive eight (8) hour work days:
 - i. All hours worked in excess of eight (8) hours per day shall be paid at one and one half (1½) the straight time rate of pay;
 - ii. All hours worked on Saturday shall be paid at one and one half (1½) the straight time rate of pay;
 - iii. All hours worked on Sundays and recognized holidays under Article 23.02 shall be paid at double the straight time rate of pay.
- c) Overtime shall be paid as follows for a work week consisting of four (4) consecutive ten (10) hour work days:
 - i. All hours worked in excess of ten (10) hours per day at one and one half (1½) the straight time rate of pay;
 - ii. All hours worked on Friday and Saturday shall be paid at one and one half (1½) the straight time rate of pay;
 - iii. All hours worked on Sundays and recognized holidays under Article 23.02 shall be paid at double the straight time rate of pay.

Extended Work Schedule

19.03 Notwithstanding Article 19.02 of the Agreement, the parties understand and agree that given the different types of work, the composition of the workforce, the variety of weather conditions and the varied geographical areas of the Project, the Contractor(s), after consultation with the Union and approval of the Association, may utilize Extended Work Schedules as set out below. Such Extended Work Schedules shall consist of scheduled days of work followed by scheduled days of rest.

- a) 10 days on and 4 days off x 10 hours/day;
 14 days on and 7 days off x 10 hours/day;
 14 days on and 14 days off x 10 hours/day;
 20 days on and 8 days off x 10 hours/day;
 21 days on and 7 days off x 10 hours/day;
 28 days on and 14 days off x 10 hours/day.
- b) These Extended Work Schedules allow for an any-day start. A work week during an Extended Work Schedule will consist of any seven (7) consecutive days as designated by the Association and/or Contractor. Examples of hours paid and hours worked for each Extended Work Schedule are contained in Schedule "H".

- c) Additional Extended Work Schedules may be implemented by the Association after consultation with the Union.
- d) Overtime for Extended Work Schedule shall be paid as follows:
 - i. All hours worked in excess of ten (10) hours per day at one and one half (1½) the straight time rate of pay;
 - ii. All hours worked on Friday and Saturday shall be paid at one and one half (1½) the straight time rate of pay;
 - iii. All hours worked on Sundays and recognized holidays under Article 23.02 shall be paid at double the straight time rate of pay.

General

- 19.04 There shall be no pyramiding of overtime and/or premiums, nor shall such overtime and/or premiums be in addition to any other overtime or premium pay provided pursuant to the Agreement, including but not limited to, call out under Article 22, pay for working a recognized holiday under Article 23, or any other premium (eg. when a Power Line Technician (“PLT”) is working in Labrador on a Sunday, which falls on a recognized holiday, such employee shall be paid at double the employee’s straight time rate of pay, plus the PLT Premium of six dollars (\$6.00) per hour worked and the Labrador Premium of three dollars and fifty cents (\$3.50) per hour worked).
- 19.05 Unpaid lunch breaks will normally be at mid-shift but may be staggered within one hour either side of mid-shift, at the Contractor’s discretion, and shall be one half (½) hour. An employee who is required, by the Contractor, to work through the two (2) hour period shall be paid at the employee’s applicable overtime rate for one half (½) hour and shall, as soon as practicable thereafter, be given sufficient time to consume his/her meal.
- 19.06 One paid rest break of ten (10) minutes will be allowed during each half shift in an eight (8) hour shift. One paid rest break of fifteen (15) minutes will be allowed during each half shift of a ten (10) hour shift. The scheduling of such rest breaks shall be at the discretion of the Contractor.
- 19.07 The Parties are committed to delivering value for pay, and with that in mind, the Parties agree as follows:
- a) Unless a reporting point is designated by the Contractor, employees shall be in attendance at their work location and prepared to commence work at the scheduled starting time for their respective work schedule(s) and shift(s). Employees shall only be paid when they start work at their designated work location, not the point when they enter the Project.
 - b) When employees are required to attend at a reporting point designated by the Contractor, the Contractor is responsible to provide transportation and compensation to the employee from the reporting point to the job site and back.
 - c) Article 19.07(b) does not apply to employees performing work on the converter station, switch yard or related work at the Muskrat Falls dam and generating facility. Employees working at these locations shall be transported by bus to and

from the designated pick-up location in Happy Valley-Goose Bay to a location near the Project. The Association will establish a daily commute busing system from the designated pick-up areas within the Free Zone, which designated pick-up areas will include a location in Sheshatshiu, North West River and Happy Valley-Goose Bay. Employees shall be paid when they start work at their designated work location, not at the point when they enter the Project.

- d) Employees shall be diligent in respecting start times, shift completion times and break times.
 - e) Employees, where appropriate, shall be permitted reasonable time for clean-up and store tools before leaving their work location at the end of each shift.
- 19.08 a) Absenteeism will not be tolerated and employees who are absent without a good and sufficient reason, acceptable to the Contractor, are subject to disciplinary action up to and including dismissal.
- b) Tardiness will not be tolerated and employees who fail to report to work, report to work late at the scheduled and designated check-in time and location, or leave their worksite early, without a good and sufficient reason, acceptable to the Contractor, are subject to disciplinary action up to and including dismissal.
- 19.09 When an employee is required to remain at work beyond their scheduled shift, after such employee works beyond two (2) unscheduled hours of overtime, such employee will be provided a fifteen (15) minute paid break and a meal. Where it is not practicable for the Contractor to provide a meal, the employee shall be paid twenty-five dollars (\$25.00) in lieu of a meal and paid fifteen (15) minutes at the applicable overtime rate. When an employee is required to remain at work beyond their scheduled shift, after such employee works beyond two (2) hours of scheduled overtime, such employee will be provided a fifteen (15) minute break within the next two (2) hours or paid fifteen (15) minutes at the applicable overtime rate. After each four (4) hours worked thereafter, the employee shall be provided with a meal and thirty (30) minutes, with pay, to consume his/her meal.
- 19.10 When an employee is required to extend his/her shift (early start and/or late quit) up to a maximum of one (1) hours, Article 19.09 will not apply. The employee shall be compensated at the applicable overtime rate of pay for the time worked.
- 19.11 The hours set forth in this Agreement do not constitute a guarantee of hours of work per day, per week or per work schedule.
- 19.12 A Contractor, after receiving written authorization from the Association, may change the work schedule(s) as provided for in Article 19, upon providing the Union twenty-four (24) hours written notice of the change.
- 19.13 The nature of the work on the Project shall, from time to time, require the interruption of work, which shall result in temporary layoff of employees for short periods of time. For those work interruptions not exceeding thirty (30) days, the Contractor shall advise the Union of its recall needs, and the Union shall issue a referral slip in the same order as those laid off.

- 19.14 All hours worked after a Regular Work Schedule or Extended Work Schedule has been completed and prior to the commencement of an employee's next Regular Work Schedule or Extended Work Schedule, shall be paid at the applicable overtime rate.

Article 20 – Shifts

- 20.01 The scheduling of the number of shifts in a day, hours of work in a shift, and the start and finish time of shifts shall be at the sole discretion of the Contractor.
- 20.02 A shift premium of three dollars (\$3.00) per hour shall be paid for all regularly scheduled hours worked, on other than the day shift. For the purposes of paying a shift premium, a day shift shall be defined as a shift commencing between the hours of 5:00 a.m. and 9:00 a.m. Overtime payment is calculated prior to the addition of any shift premium.
- 20.03 No employee shall be scheduled to work more than one (1) straight time shift in each consecutive twenty-four (24) hour period. However, if an employee continues to work past the end of their scheduled shift or commences a new shift prior to receiving a break of eight (8) consecutive hours, he/she shall receive the applicable overtime rate of pay for such shift continuation for each additional shift until a break of eight (8) consecutive hours occurs.
- 20.04 An employee whose shift schedule is changed (moved for one shift to another shift) shall receive twenty-four (24) hours' notice of the shift change. No employee shall suffer loss of regular earnings due to his/her shift change.
- 20.05 Split shifts may be utilized for accommodations classifications. Where an employee is scheduled to work a split shift, the employee shall receive a split shift premium of one dollar and fifty cents (\$1.50) per hour.

Article 21 – Reporting Time

- 21.01 Employees who are not residents of the Accommodation Complex and who are given two (2) hours' notice not to report to work shall not be entitled to reporting time. Employees who are residents of the Accommodation Complex and who are given one (1) hour notice not to report to work shall not be entitled to reporting time.

Notice may be given to employees who are not residents of the Accommodation Complex through local radio stations or by requiring employees to call a designated phone number, or by such other reasonable means as determined by the Association and/or Contractor. Notice may be given to residents of the Accommodation Complex by posting a notice in a common area of the Accommodation Complex or by any other reasonable means determined by the Association and/or Contractor.

Where employees are not provided with notice pursuant to this Article 21.01, the following shall apply:

Employees who are not residents of the Accommodation Complex who are given less than two (2) hours' notice not to report to work shall be entitled to be paid to the employee's scheduled mid-shift at the applicable rate.

Employees who are residents of the Accommodation Complex who are given less than one (1) hour notice not to report to work shall be entitled to be paid to the employee's scheduled mid-shift at the applicable rate.

- 21.02 If an employee reports to work as requested at the regular starting time and is not put to work, the so affected employee shall be entitled to be paid to the employee's scheduled mid-shift at the applicable rate.
- 21.03 If an employee reports to work as requested at the regular starting time and is put to work, the so affected employee shall be paid all hours worked at the employee's applicable rate of pay and in no case less than to the employee's scheduled mid-shift.
- 21.04 If an employee reports to work as requested at the regular starting time and is requested to standby, either at the workplace or another area designated by the Contractor, the so affected employee shall be paid for all hours he/she works and stands by at the request of the Contractor at the employee's applicable rate of pay and in no case less than to the employee's scheduled mid-shift.
- 21.05 The above payment scenarios are mutually exclusive and shall not be pyramided, however, the employee's applicable rate shall include all applicable premiums.
- 21.06 In order to qualify for reporting time the employee must remain on the job until otherwise directed by the Contractor.

Article 22 – Call Out

- 22.01 Employees who have completed their day's scheduled hours of work and have left the worksite or have returned to the accommodation site and are called out and return to work, shall receive no less than four (4) hours' pay at the employee's applicable overtime rate. Employees who work in excess of four (4) hours shall be paid for the actual hours worked at the employee's applicable overtime rate and applicable premiums until the commencement of their regularly scheduled shift.
- 22.02 A callout under this Agreement is not scheduled work.

Article 23 – Vacation and Recognized Holidays

- 23.01 Payment for annual vacations and pay in lieu of recognized holidays shall be thirteen (13%) percent of gross wages including overtime for all employees.
- 23.02 The following recognized holidays will be observed:
- a) New Year's Day
 - b) Good Friday
 - c) Canada Day
 - d) Civic Holiday
 - e) Labour Day

- f) Remembrance Day
- g) Christmas Eve
- h) Christmas Day
- i) Boxing Day
- j) Victoria Day
- k) Thanksgiving Day

- 23.03 All work performed on a recognized holiday shall be paid at double the straight time rate of pay.
- 23.04 The date of observance of recognized holidays shall be as gazetted by the Provincial Government or as designated by the Association or Contractor after consultation with the Union.
- 23.05 An employee who is eligible to take vacation may request vacation time off in writing to the Contractor. The vacation time is subject to the approval of the Contractor which approval will not be unreasonably withheld.

Article 24 – Accommodations

- 24.01 An Accommodation Complex shall be provided, maintained and operated in full compliance with all applicable laws and regulations. During the early work phase of the Project, a temporary Accommodation Complex may be provided to accommodate workers until the Accommodation Complex becomes available.
- 24.02 The Owner or his/her designee shall have the sole right to manage the Accommodation Complex, including the assignment of accommodations.
- 24.03 An Accommodation Complex committee composed of an equal number of representatives from the Association and Union shall be established for the purposes of providing input with respect to the development, implementation and administration of accommodation rules.
- 24.04 Workers living in the Accommodation Complex, who do not report for work on a regular work day due to causes other than legitimate illness and/or legitimate absences when they are physically able to do so, may be charged the full room and board rate for each regular day not worked.
- 24.05 Workers, failing to make use of Accommodation Complex on a repeated basis, may be charged at the full room and board rate for each day not used, and may forfeit their right to accommodations.
- 24.06 Accommodation Complex residents will be provided with sufficient and suitable food appropriate for the required breaks specified under this Agreement.
- 24.07 Accommodations will take into account the requirements of a diverse workforce.

Article 25 – Travel and Board

25.01 For the purpose of this article, the definition of “permanent residence” for a resident of Newfoundland and Labrador shall be the same as the definition of Provincial Resident in this Agreement and for those outside of Newfoundland and Labrador, as follows:

“An employee’s permanent residence is the place where he/she maintains a self-contained domestic establishment where he/she ordinarily resides such as a dwelling, house or similar place of residence where a person generally eats and sleeps. Factors and/or current documents to be examined when determining who is a resident may include property tax assessment, lease agreement, driver’s license, vehicle registration, income tax returns, voter’s list registration or proof of provincial health care coverage”

25.02 Free Zone: There shall be a Free Zone of sixty (60) road kilometres from the designated reporting point or work location as per Article 19, or from a designated pick-up location in Happy Valley-Goose Bay for work on the converter station, switch yard, and related activities at the Muskrat Falls dam and generating facility construction site, whichever is the case, to the city or town boundary of the employee’s permanent residence. Employees living within the Free Zone shall travel to and from the designated reporting point or work location as per Article 19, or from a designated pick-up location in Happy Valley-Goose Bay for work on the converter station, switch yard, and related activities at the Muskrat Falls dam and generating facility construction site, whichever is the case, at their own expense.

25.03 Travel Zone: Employees traveling to work who permanently reside a distance greater than sixty (60) kilometers but less than one hundred (100) kilometers from the designated reporting point or work location as per Article 19, or from a designated pick-up location in Happy Valley-Goose Bay for work on the converter station, switch yard, and related activities at the Muskrat Falls dam and generating facility construction site, whichever is the case, to the city or town boundary of the community of the employee’s permanent residence shall be paid travel allowance as set out in Article 25.06 per road kilometer one way between the above noted points.

25.04 Employees travelling to work who permanently reside at a distance of one hundred (100) kilometers or greater, from the designated reporting point or work location as per Article 19, or from a designated pick-up location in Happy Valley-Goose Bay for work on the converter station, switch yard, and related activities at the Muskrat Falls dam and generating facility construction site, whichever is the case, to the city or town boundary of the community of the employee’s permanent residence, using the most direct route, shall, at the Contractor’s discretion, be provided board allowance in accordance with Article 25.07 or accommodations at no cost to the employee, provided the Accommodations Complex or other accommodations are available.

25.05 When an employee is entitled to accommodations pursuant to this Article and accommodations are not available, such employee shall be provided a board allowance in accordance with Article 25.07.

If accommodation space becomes available, such employee, if requested by the Contractor, must commence residing at the accommodations within seven (7) days of being so notified. The employee shall cease being paid the board allowance once they

commence residing at the accommodations or upon the expiration of seven (7) days of being notified, whichever is first.

25.06 The travel allowance in accordance with Article 25.03 shall be as follows:

- a) \$0.72 per road kilometer effective date of signing;
- b) \$0.74 per road kilometre effective May 1, 2013;
- c) \$0.76 per road kilometer effective May 1, 2014;
- d) \$0.78 per road kilometer effective May 1, 2015;
- e) \$0.80 per road kilometer effective May 1, 2016;
- f) \$0.82 per road kilometer effective May 1, 2017.

25.07 The board allowance in accordance with Article 25.05 shall be as follows:

- a) \$100.00 per day effective date of signing;
- b) \$104.00 per day effective May 1, 2013;
- c) \$108.00 per day effective May 1, 2014;
- d) \$112.00 per day effective May 1, 2015;
- e) \$116.00 per day effective May 1, 2016;
- f) \$120.00 per day effective May 1, 2017.

25.08 Zone 1 through 5:

An employee, whose permanent residence is located in Zones 1 through 5 being the distance from the employee's accommodations or Accommodations Complex as set out below shall be provided a Travel Allowance when working an Extended Work Schedules of ten (10) consecutive days or more, provided the employee travels by road from their accommodations or the Accommodations Complex to the employee's permanent residence during the Extended Work Schedule turnaround and upon providing proof of travel expense in a form satisfactory to the Contractor. The Travel Allowance shall be payable as follows:

- a) Zone 1 (100 - 200 km) - \$90 (round trip);
- b) Zone 2 (201 - 300 km) - \$120 (round trip);
- c) Zone 3 (301 - 400 km) - \$150 (round trip);
- d) Zone 4 (401 - 500 km) - \$220 (round trip);
- e) Zone 5 (501+ km) - \$260 (round trip);

Work in Labrador

- 25.09 a) Employee's working an Extended Work Schedule for work in Labrador of ten (10) or more consecutive days, whose permanent residence is located outside of Labrador or in an area of Labrador only accessible by air, will be provided by the Contractor, during each Extended Work Schedule turnaround, the following:
- i. For employees whose permanent residence is on the Island of Newfoundland, air transportation to and from St. John's or such other designated hubs on the Island of Newfoundland to Happy Valley-Goose Bay or such other designated hubs in Labrador;
 - ii. For employees whose permanent residence is in Labrador, air transportation to and from designated hubs in Labrador to Happy Valley-Goose Bay or such other designated hubs in Labrador; and
 - iii. For employees whose permanent residence is outside Newfoundland and Labrador, air transportation to and from designated hubs in other parts of Canada to Happy Valley-Goose Bay or such other designated hubs in Labrador.

Work in Newfoundland

- b) Employee's working an Extended Work Schedule for work on the Island of Newfoundland of ten (10) or more consecutive days, whose permanent residence is located outside the Island of Newfoundland, will be provided by the Contractor, during each Extended Work Schedule turnaround, the following:
- i. For employees whose permanent residents is in Labrador, air transportation to and from Happy Valley-Goose Bay or such other designated hubs in Labrador to St. John's or such other designated hubs on the Island of Newfoundland; and
 - ii. For employees whose permanent residents is located outside Newfoundland and Labrador, air transportation to and from designated hubs in other parts of Canada or outside Canada to St. John's or such other designated hubs on the Island of Newfoundland.

In the event that an overnight stay is required, while in transit to the Project, because of a disruption in air travel, the Contractor shall provide board allowance for each day the employee is delayed provided such employees permanent residence is one hundred (100) km or more from the departing hub and the employee provides proof of a hotel expenditure in a form satisfactory to the Contractor.

In the event an overnight stay is required because an employee is unable to leave from the departing hub near the work location on the employee's scheduled turnaround because of a disruption in air travel, such employee may remain in the Accommodations Complex or other accommodations provided by the Contractor, at no cost, or at the Contractor's discretion, be provided board

allowance each day of the disruption until air transportation from the departing hub near the work location is available.

The Association and/or Contractor shall provide ground transportation to and from the work location to the designated hub.

Employees shall not be paid travel time.

25.10 When an employee is laid off, the Contractor shall provide air travel or a Travel Allowance consistent with Articles 25.08 and 25.09. Employees who quit or have their employment terminated for cause prior to the completion of the employee's Work Schedule may not be entitled to air travel or Travel Allowance consistent with Articles 25.08 and 25.09.

25.11 For the purposes of this Article, all distances will be determined by the Stats Canada Website (<http://www.stats.gov.nl.ca/DataTools/RoadDB/Distance/>).

Article 26 – Wages and Benefits

26.01 All employees covered by this Agreement shall receive wages and benefits effective the commencement of construction in accordance with the attached Schedule "C".

26.02 The work week for payday purposes shall end on Saturday at midnight and employees shall be paid on Thursday of the following week. The method of payment shall be by electronic deposit and a weekly Statement of Earnings and Deductions shall be issued to each employee on Thursday, including the following information:

- a) Wage rate;
- b) Number of hours paid at the straight time rate of pay;
- c) Number of hours paid at the overtime rate of pay;
- d) Amount of premium and allowances;
- e) Vacation pay;
- f) Holiday pay;
- g) The amount and purpose of each deduction;
- h) Name of the Contractor issuing the payment;
- i) The worker's name and payroll number;
- j) The pay period;
- k) Gross and net earnings; and
- l) Pension contributions.

- 26.03 The Contractor shall remit contributions in an amount and manner as required by the attached Schedule "C". The remittance of these funds shall in no way require the Contractor to become or remain a member of any union, group or association as a condition for making such contributions.
- 26.04 Changes to benefit contributions may be made at the request of the Union, in writing, subject to the gross hourly package remaining unchanged. Such request to change the benefit contributions may be made annually between April 1st and April 30th and shall be implemented no later than June 1st.
- 26.05 The Contractor shall remit the amounts for all funds as specified in Article 27 and Schedule "C".

Article 27 – Project Funds

Designated Fund (NETCO Fund)

- 27.01 The parties recognize the importance of the promotion, advancement, training and growth in the Electrical Industry. Effective at the commencement of Project construction, the Contractor will remit to the International Brotherhood of Electrical Workers three cents (\$0.03) per hour worked as a contribution to the National Electrical Trades Council.

Project Administration Fund

- 27.02 The Contractor(s) shall remit ninety cents (\$0.90) per hour worked under this Agreement to the Project Administration Fund. These monies shall be remitted no later than the fifteenth (15th) day of the month following the month worked. The money shall be remitted to IBEW Local 1620 directly by the Contractor(s).

Employee Assistance Program

- 27.03 The Union shall provide for an Employee Assistance Program ("EAP Program"), acceptable to the Association, as part of the health and welfare benefits available to employees working on the Project. The cost of the EAP Program shall be equally shared by the Union and Contractor(s) to a maximum of three cents (\$0.03) per hour worked for the Union and three cents (\$0.03) per hour worked for the Contractor(s).

Article 28 – Labrador Premium, Island Premium and PLT Premium

Labrador and Island Premiums

- 28.01 In recognition of the uniqueness of the Project, its importance to the Province of Newfoundland and Labrador and the duration of the Project, workers shall receive the following:
- a) For work performed in Labrador, a Labrador Premium payment of three dollars and fifty cents (\$3.50) per hour for all hours worked. Contractors shall pay the premium quarterly (approximately every ninety (90) days and as agreed to by the Parties) at the end of the next pay period. The premium is not part of the wage package and does not attract a vacation pay and recognized holiday pay.

- b) For work performed in Newfoundland, an Island Premium payment of three dollars (\$3.00) per hour for all hours worked. Contractors shall pay the premium quarterly (approximately every ninety (90) days and as agreed to by the Parties) at the end of the next pay period. The premium is not part of the wage package and does not attract a vacation pay and recognized holiday pay.

28.02 The dates for payment of the Labrador Premium and Island Premium shall be set by the Liaison Committee annually.

28.03 Upon layoff, workers shall receive their respective Labrador Premium or Island Premium in their final pay.

Power Line Technician Premium

28.04 The Parties agree that based upon a competitive labour market and the challenge of attracting skilled Power Line Technicians for the Project, and in recognition of the hazardous nature of the job inherent in working with electricity, in relation to the construction of the transmission system, including but not limited to the installation, maintenance, testing, repair and dismantling of electrical power generation, transmission and distribution system equipment, lines, apparatus and substations, Power Line Technicians employed and performing work on the Project shall receive a payment of six dollars (\$6.00) per hour for all hours worked, commencing with the commencement of construction and continuing for the duration of the Project (the "PLT Premium"). Contractors shall pay PLT Premium each pay period. The PLT Premium is not part of the wage package and does not attract payment of Vacation Pay and Recognized Holiday Pay.

Article 29 – Project Enhancement Programs

29.01 The Association may, at its discretion, implement a project enhancement program(s) for the Project or portions of the Project, after consultation with the Union.

Article 30 – Termination of Employment

30.01 When an employee has been terminated or laid off while away from the Project, any personal belongings shall be shipped to his/her last known address, at the Contractor's expense unless previous arrangements have been made.

30.02 Contractor(s) shall provide four (4) hours' notice or pay in lieu of notice to employees who are laid off. The employees shall be permitted reasonable time during these four (4) hours to pick up and return Contractor(s) tools, check out of accommodations, and/or prepare his/her own tools for the next job.

30.03 Layoffs shall occur in reverse order of hiring priority described in Article 7. For greater clarity, the last employees laid off shall be qualified residents of Newfoundland and Labrador and layoffs shall be in compliance with the Benefits Strategy and hiring priority for qualified Labrador Innu for the Labrador portion of the Project, subject to the retained employees having the skills, abilities, competencies and qualifications necessary to complete the remaining work.

- 30.04 Employees who are being provided with accommodations by the Contractor and who are laid off and are being provided transportation by the Contractor shall be entitled to continue to receive accommodations until such time as transportation is made available by the Contractor.
- 30.05 In the event of a reduction of the workforce, anyone promoted from journeyperson to forepersons or working foreperson may be demoted to journeyperson. Anyone name hired as a foreperson or working foreperson shall be laid off as a foreperson or working foreperson.
- 30.06 Employees who are laid off or terminated for just cause shall receive all monies owing to them on the next payday in accordance with the Contractors normal payroll practices. The employee's Record of Employment shall be mailed to the employee's last known mailing address on file with the Contractor within five (5) calendar days after the end of the pay period in which the employee is laid off or terminated.
- 30.07 The Parties agree that in the case of layoffs, apprentices will be retained to the extent permitted by Project conditions as determined by the Contractor, Article 30.03 and the law.

Article 31 – Tools

- 31.01 Employees are to supply appropriate tools and equipment required to carry out the work to be performed as determined by the Association. Power Line Technicians, Power Line Technician Apprentices, Electricians and Electrician Apprentices shall supply the tools and equipment set out in Schedule "G" attached hereto and forming part of this Agreement. The tools and equipment are subject to verification by the Contractor upon commencement of employment. If the Contractor deems that other tools or equipment are necessary, they shall be supplied by the Contractor.
- 31.02 The employee's personal tools shall be in good condition when he/she is hired on the job and they shall be maintained and kept in good condition.
- 31.03 The Contractor(s) will provide the appropriate lock-fast facilities for storage of personal tools.
- 31.04 Employees will be held responsible for tools, special and/or protective clothing and safety apparatus supplied to them by the Contractor. If the employee fails to return the supplied items in good condition to the Contractor, with the exception of fair wear and tear, at the time of termination or on request prior to the employee's termination, the replacement cost of such items shall be deducted from any monies due to the employee.
- Employees will not, however, be held responsible for loss or damage to tools, special and/or protective clothing and safety apparatus supplied to them by the Contractor as a result of fire, theft due to break-in or forcible entry of Contractor arranged lock-fast facilities, provided the loss or damage is immediately reported by the employee, in writing, to the Contractor.
- 31.05 The Contractor shall replace an employee's personal tools when:

- a) The tools are destroyed by fire, lost through theft by forced entry of a designated storage place provided by the Contractor, and provided that the loss or damage is immediately reported by the employee, in writing, to the Contractor.
 - b) In the course of the employee's work assignment, the tools are damaged beyond repair, provided the employee satisfies his/her Contractor that the damage was not intentional or caused by the employee's failure to exercise due care and attention.
- 31.06 Contractors will not be held responsible for personal tools which have not been identified on the employee's tool list by an authorized Representative of the Contractor. The employee shall provide an inventory list and the Contractor shall conduct an inventory check prior to the employee's commencement of work.
- 31.07 Employees, arriving at the Project or leaving the Project upon termination of employment, will be assisted in transporting their personal tools to or from the bus depot or parking lot.
- 31.08 An employee's tools which have to be replaced or sent off the job site for repair will be replaced and returned as soon as possible.

Article 32 – Welding Testing

- 32.01 When welders are hired on the project, the Contractor hiring the welder shall compensate the Union supplying the welder, five hundred dollars (\$500.00) for each welding ticket the welder is required to have to perform the work. The welder shall be reimbursed four (4) hours pay for each ticket to compensate for time involved in completing each test. In the event a Union member is laid off and rehired by the Contractor or another Contractor working on Site, the Contractor or the other Contractor shall not be required to pay the five hundred dollars (\$500.00) for each ticket and the welder shall not be reimbursed pay if the same welding tickets are required. The Contractor is responsible for the cost of Canadian Welding Bureau re-certifications if the certification expires more than one (1) year after the welder commences to work on Site. These re-certifications shall be without loss of pay to a maximum of one (1) regularly scheduled work day at straight time.

Article 33 – Lunch Room and Facilities

- 33.01 The Contractor shall provide and maintain clean, heated, sanitary facilities, which shall include modern flush toilets, urinals and wash basins. Where this is not practicable, chemical toilets and pump tank facilities will be provided.
- 33.02 Fresh, safe drinking water and sanitary cups shall be provided to the employees.
- 33.03 The Contractor shall, where practical, provide lunch rooms and determine their location, subject to restrictions of the work area in which the employees may take their breaks and meals.
- 33.04 When lunch rooms are used, they shall be kept heated and clean, with adequate size and seating capacity to accommodate the number of people using the facility. General lunch rooms shall be provided with reasonable amenities.

Article 34 – Apprenticeship and Training

- 34.01 The Association, the Contractors and the Union, in alignment with the Benefits Strategy and obligations to the Labrador Innu, agree to work cooperatively to create training, development and apprenticeship opportunities as part of their joint responsibility to maintain a supply of skilled tradespersons for the Project.
- 34.02 The Parties agree to cooperate to the fullest extent with any government instituted Apprenticeship Training Plan including layoff for yearly in-school training where requested by the employee.
- 34.03 The Association, the Contractors and the Union agree, to the extent permitted by Project conditions and law, to maximize placement and utilization of apprentices.
- 34.04 Gender equity and diversity shall be a consideration when hiring or referrals of apprentices to the Project as part of the Parties cooperative efforts to achieve, sustain and hopefully surpass participation goals for women and underrepresented groups established in consultation with the Province.

Article 35 – Leave of Absence

- 35.01 a) Employees shall be granted three (3) regularly scheduled work days leave with pay (the employee's regular rate times the number of hours the employee is scheduled to work on those days plus any applicable premium) commencing on the day after the date of death of the spouse, common law spouse, child (step child), parent (step parent), legal guardian, brother, sister, parent-in-law, grandparent, grandchild, daughter-in-law, son-in-law, sister-in-law, brother-in-law or other relative or dependant living in the employee's Permanent Residence.
- b) Employees may request and be granted, subject to the approval of the Contractor, additional leave days without pay to cover extenuating circumstances associated with the bereavement leave.
- 35.02 Bereavement leave shall not be granted for time that would not normally have been worked and under no circumstances shall pay be granted for overtime missed as a result of an employee's absence.
- 35.03 Employees shall be entitled to pregnancy, parental and adoption leave in accordance with the provisions of the Newfoundland and Labrador *Labour Standards Act* in effect on of the date of this Agreement.
- 35.04 Employees summoned to attend upon a court of inquiry or any other judicial proceeding as a juror or prospective juror in accordance with the Newfoundland and Labrador *Jury Act, 1991* shall be paid the same as they would if they had been scheduled to work.
- 35.05 The Contractor may grant a leave of absence, without pay, to any employee for personal or cultural reasons. Requests for such leave shall be made in writing at least one week in advance of the requested leave. Leave request shall be subject to Contractor needs and Project conditions but shall not be unreasonably denied by the Contractor.

Article 36 – Work Refusals

36.01 There shall be no work refusal by any member(s) of the bargaining unit during the life of this Agreement, including refusal to handle or install material, equipment, modules or components nor shall they refuse to perform work because other work was or will be performed or was not performed by persons or class of persons who were not or are not members of a trade union or a particular trade union.

Article 37 – Commissioning

37.01 Commissioning activities are important to the success of the Project. During the Commissioning process, the Owner, EPCM, commissioning contractor or vendor, carrying out Commissioning work, may utilize Union members, Owner employees, vendor employees, EPCM employees or commissioning contractor employees who are not members of the bargaining unit. Notwithstanding any other article in this Agreement, workers required for Commissioning may be selected by the Owner, EPCM, commissioning contractor or vendor from the Union and may be required to work on multi-disciplined Work Teams. Commissioning work executed by Union members shall fall within the scope of this Agreement. Commissioning work executed by Owner employees, vendor employees or representatives, EPCM employees or commissioning contractor employees who are not members of the bargaining unit shall fall outside the scope of this Agreement.

Article 38 – Saving

38.01 Should any provision of this Agreement be found by an arbitrator or court of competent jurisdiction to be in conflict with any law or regulation of Canada or Newfoundland and Labrador, such provision shall be superseded by such law or regulation. Notwithstanding such invalidation, the remaining provisions shall remain in full force and effect.

38.02 Unless prohibited from doing so by such law, regulation or court ruling, the Parties shall commence negotiations within fourteen (14) days to provide a valid replacement of such provision.

38.03 Notwithstanding Article 15.08 or any other Article in this Agreement, in the event that negotiations do not result in agreement on a legal replacement provision within fourteen (14) days of the commencement of negotiations, or such longer period as may be mutually agreed, the matter shall be resolved in accordance with the arbitration process in this Agreement.

Article 39 – Duration

39.01 This Agreement shall be for a term commencing on the later of (i) Date of its signing or (ii) Date the Lieutenant Governor-in-Council issues a Special Project Order respecting the Project, and continuing for the duration of the Project, including mobilization and demobilization by the Contractors, except as provided herein.

39.02 Without restricting the generality of the foregoing, this Agreement ceases to apply when Mechanical Completion of the work, or a part of components thereof is attained and is handed over to the Owner, or its designate.

- 39.03 Mechanical Completion occurs when construction is physically complete (manufactured, fabricated, installed and connected), safe (related systems necessary for protection of personnel and property are in place), clean (flushed, clean and dry), tight (bolt tensioned, hydro tested and re-instated), inspected, tested and documented.
- 39.04 Notwithstanding Article 39.02, a unit(s), component(s), system(s), equipment or area(s) of the Project may be deemed ready for acceptance by the Owner, or its designate, prior to Mechanical Completion. When unit(s), system(s), equipment or area(s) of the Project is deemed ready for acceptance by the Owner, or its designate, prior to Mechanical Completion, this Agreement ceases to apply to the unit(s), component(s), system(s), equipment or area(s) of the Project effective the date it is deemed ready for acceptance.

Subject to Articles 8.03, 8.04 and 8.05 of this Agreement, should the Owner, or its designate, require assistance from a Contractor in modifying, altering or fixing up any work performed by the Contractor pursuant to this Agreement, or part or components thereof, the work will normally be performed by members of the Union pursuant to this Agreement.

Signed at St. John's, Newfoundland and Labrador this 28th day of January, 2013.

INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS

(digital copy of signed agreement)
Phil Flemming

INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS, LOCAL 1620

(digital copy of signed agreement)
Terry Rose

(digital copy of signed agreement)
Don Murphy

LOWER CHURCHILL TRANSMISSION CONSTRUCTION EMPLOYERS' ASSOCIATION INC.

(digital copy of signed agreement)
Lance Clarke
Director

(digital copy of signed agreement)
David Clark
Director

SCHEDULE "A"
PROJECT DEFINITION

Schedule "A" - Project Definition

1. "Project" means the "scope of construction work" performed by Contractors engaged by the Owner or the EPCM agent of the Owner performing work within the geographical area designated on Schedule "B" or other geographical area designated in writing by the Owner or the EPCM agent of the Owner, or construction work described below performed outside the area delineated on Schedule "B" or outside the designated geographical area, which scope of construction work is defined as follows:
 - a) Construction activities include construction, dismantling and/or erection of transmission towers, related infrastructure, materials or equipment within the transmission right-of-way described on Schedule "B" or directly adjacent to the transmission right-of-way.
 - b) Construction of substations, switch yards, converter stations, electrodes, electrode lines, synchronous condensers, transition compounds and related construction activities at work sites designated by the Owner or the EPCM agent of the Owner, except as provided in paragraph 2 below.
 - c) Construction support activities being the operation of the designated lay-down, storage, staging and warehouse areas and the transportation of goods, equipment, materials or supplies between the designated area on Schedule "B" and/or geographical areas designated by the Owner or EPCM agent of the Owner. Construction of required access roads approved by the Owner or EPCM agent of Owner and any designated related activities to the construction of the required access roads.
 - d) Construction support activities being mobilization and demobilization of accommodations designated by the Owner or the EPCM agent of the Owner, the operation of the designated accommodations, food services in the designated accommodations or other designated activities in the accommodations.
 - e) The transportation of employees from the designated reporting point described in Article 19 to the work areas located within the geographical area delineated on Schedule "B" or any other geographical area designated by the Owner or EPCM agent of the Owner.
2. Project scope of construction work shall not include:
 - a) persons engaged in the supply, installation, termination and testing of the Marine HVDC cable system crossing the Strait of Belle Isle, including but not limited to associated work from the cable system components in the Transition Compound at Forteau, Labrador, to cable system components in the Transition Compound at Shoal Cove, Newfoundland. This work includes but is not limited to persons engaged in the supply and installation of surge arrestors, terminations, fibre optic system, HVDC cable accessory and spares, land HVDC cable, engineered thermal backfill, transition joint bays, horizontally drilled cable conduits, HVDC marine cable, submarine berm, operation of rock quarry and transportation of materials from such rock quarry;
 - b) employees of Nalcor Energy, Emera Inc. and NSP Maritime Link Inc. or any of their subsidiaries, performing work on the Project or any portion of the Project;

- c) Construction activities performed under another Special Project Order issued under Section 70 of the *Labour Relations Act* including but not limited to the construction of the switch yard at the Lower Churchill Hydro Electric Project at Muskrat Falls to the completion of the concrete pad and anchor bolts, and the construction of a converter station to the point the building is mechanically complete and ready to receive the installation of valve halls and related equipment for installation. The Owner or the EPCM agent of the Owner has the absolute discretion to determine when the converter station is mechanically complete and ready to receive the installation of valve halls and related equipment for installation. The Owner or the EPCM agent of the Owner has the absolute discretion to determine when the concrete pad and anchor bolts of the switch yard have been completed.
- d) Non-designated, laydown areas, staging areas or storage areas for materials fabricated for transmission construction or any other goods and materials.

SCHEDULE "B"
DESIGNATED GEOGRAPHICAL AREA

Schedule “B” – Designated Geographical Area

1. The geographical area of the Project for the construction activities described on Schedule “A” paragraph 1(a) shall include the area or areas designated by the Owner or the EPCM agent of the Owner as transmission right-of-ways for the following:
 - a) The Labrador Island Link, being a transmission right-of-way from Muskrat Falls Labrador to Soldier’s Pond Newfoundland; and
 - b) The Muskrat Falls to Churchill Falls Link, being a transmission right-of-way from Muskrat Falls Labrador to Churchill Falls Labrador.
2. The geographical area of the Project for the construction support activities described on Schedule “A” paragraphs 1(b), (c) and (d) shall include the area or areas designated by the Owner or the EPCM agent of the Owner.
3. The geographical areas of the Project designated by the Owner or the EPCM agent of the Owner in paragraphs 1 and 2 above may be deleted, modified or amended at any time by the Owner or the EPCM agent of the Owner upon providing notice to the Union.

SCHEDULE "C"
GROSS HOURLY PACKAGES
2013 – 2017

**Schedule "C"
Wages and Benefits
Effective May 1, 2013**

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Health & Welfare	Training	Project Admin Fund	Pension	NETCO Fund	Retention & Promotion	Gross Hourly Rate
Journeyman Power Line Technician	\$ 31.33	\$ 3.13	\$ 0.94	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 44.38
Journeyman Electrician	\$ 34.86	\$ 3.49	\$ 1.05	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 48.37
Journeyman Civil	\$ 30.50	\$ 3.05	\$ 0.92	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 43.45
Journeyman Mechanical I	\$ 34.00	\$ 3.40	\$ 1.02	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 47.40
Journeyman Mechanical II	\$ 32.00	\$ 3.20	\$ 0.96	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 45.14
Heavy-Duty Mechanic Technician	\$ 32.00	\$ 3.20	\$ 0.96	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 45.14
Crane Operator	\$ 33.50	\$ 3.35	\$ 1.01	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 46.84
Heavy Equipment Operator	\$ 29.00	\$ 2.90	\$ 0.87	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 41.75
Light Equipment Operator	\$ 28.00	\$ 2.80	\$ 0.84	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 40.62
Blaster/Driller/Compressor Operator	\$ 29.00	\$ 2.90	\$ 0.87	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 41.75
Mechanic Helper	\$ 26.18	\$ 2.62	\$ 0.79	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 38.56
Accommodations Maintenance Person	\$ 26.18	\$ 2.62	\$ 0.79	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 38.56
Communications Installer	\$ 25.18	\$ 2.52	\$ 0.76	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 37.43
Utility Technician	\$ 26.18	\$ 2.62	\$ 0.79	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 38.56
Utility Person	\$ 25.18	\$ 2.52	\$ 0.76	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 37.43
Storekeeper	\$ 27.13	\$ 2.71	\$ 0.81	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 39.64
Arborist	\$ 25.73	\$ 2.57	\$ 0.77	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 38.05

*Amended per Letter of Understanding on page 76

**Schedule "C"
Wages and Benefits
Effective May 1, 2014**

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Health & Welfare	Training	Project Admin Fund	Pension	NETCO Fund	Retention & Promotion	Gross Hourly Rate
Journeyman Power Line Technician	\$ 33.10	\$ 3.31	\$ 0.99	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.63
Journeyman Electrician	\$ 36.63	\$ 3.66	\$ 1.10	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 51.62
Journeyman Civil	\$ 32.27	\$ 3.23	\$ 0.97	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 46.70
Journeyman Mechanical I	\$ 35.77	\$ 3.58	\$ 1.07	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.65
Journeyman Mechanical II	\$ 33.77	\$ 3.38	\$ 1.01	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.39
Heavy-Duty Mechanic Technician	\$ 33.77	\$ 3.38	\$ 1.01	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.39
Crane Operator	\$ 35.27	\$ 3.53	\$ 1.06	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.09
Heavy Equipment Operator	\$ 30.77	\$ 3.08	\$ 0.92	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.00
Light Equipment Operator	\$ 29.77	\$ 2.98	\$ 0.89	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 43.87
Blaster/Driller/Compressor Operator	\$ 30.77	\$ 3.08	\$ 0.92	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.00
Mechanic Helper	\$ 27.95	\$ 2.79	\$ 0.84	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 41.81
Accommodations Maintenance Person	\$ 27.95	\$ 2.79	\$ 0.84	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 41.81
Communications Installer	\$ 26.95	\$ 2.69	\$ 0.81	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 40.68
Utility Technician	\$ 27.95	\$ 2.79	\$ 0.84	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 41.81
Utility Person	\$ 26.95	\$ 2.69	\$ 0.81	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 40.68
Storekeeper	\$ 28.90	\$ 2.89	\$ 0.87	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 42.89
Arborist	\$ 27.50	\$ 2.75	\$ 0.82	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 41.30

**Schedule "C"
Wages and Benefits
Effective May 1, 2015**

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Health & Welfare	Training	Project Admin Fund	Pension	NETCO Fund	Retention & Promotion	Gross Hourly Rate
Journeyman Power Line Technician	\$ 34.87	\$ 3.49	\$ 1.05	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 49.63
Journeyman Electrician	\$ 38.40	\$ 3.84	\$ 1.15	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 53.62
Journeyman Civil	\$ 34.04	\$ 3.40	\$ 1.02	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.70
Journeyman Mechanical I	\$ 37.54	\$ 3.75	\$ 1.13	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 52.65
Journeyman Mechanical II	\$ 35.54	\$ 3.55	\$ 1.07	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.39
Heavy-Duty Mechanic Technician	\$ 35.54	\$ 3.55	\$ 1.07	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.39
Crane Operator	\$ 37.04	\$ 3.70	\$ 1.11	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 52.09
Heavy Equipment Operator	\$ 32.54	\$ 3.25	\$ 0.98	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.00
Light Equipment Operator	\$ 31.54	\$ 3.15	\$ 0.95	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.87
Blaster/Driller/Compressor Operator	\$ 32.54	\$ 3.25	\$ 0.98	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.00
Mechanic Helper	\$ 29.72	\$ 2.97	\$ 0.89	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 43.81
Accommodations Maintenance Person	\$ 29.72	\$ 2.97	\$ 0.89	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 43.81
Communications Installer	\$ 28.72	\$ 2.87	\$ 0.86	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 42.68
Utility Technician	\$ 29.72	\$ 2.97	\$ 0.89	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 43.81
Utility Person	\$ 28.72	\$ 2.87	\$ 0.86	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 42.68
Storekeeper	\$ 30.67	\$ 3.07	\$ 0.92	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 44.89
Arborist	\$ 29.27	\$ 2.93	\$ 0.88	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 43.30

**Schedule "C"
Wages and Benefits
Effective May 1, 2016**

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Health & Welfare	Training	Project Admin Fund	Pension	NETCO Fund	Retention & Promotion	Gross Hourly Rate
Journeyman Power Line Technician	\$ 36.64	\$ 3.66	\$ 1.10	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 51.63
Journeyman Electrician	\$ 40.17	\$ 4.02	\$ 1.21	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 55.62
Journeyman Civil	\$ 35.81	\$ 3.58	\$ 1.07	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.70
Journeyman Mechanical I	\$ 39.31	\$ 3.93	\$ 1.18	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 54.65
Journeyman Mechanical II	\$ 37.31	\$ 3.73	\$ 1.12	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 52.39
Heavy-Duty Mechanic Technician	\$ 37.31	\$ 3.73	\$ 1.12	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 52.39
Crane Operator	\$ 38.81	\$ 3.88	\$ 1.16	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 54.09
Heavy Equipment Operator	\$ 34.31	\$ 3.43	\$ 1.03	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 49.00
Light Equipment Operator	\$ 33.31	\$ 3.33	\$ 1.00	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.87
Blaster/Driller/Compressor Operator	\$ 34.31	\$ 3.43	\$ 1.03	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 49.00
Mechanic Helper	\$ 31.49	\$ 3.15	\$ 0.94	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.81
Accommodations Maintenance Person	\$ 31.49	\$ 3.15	\$ 0.94	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.81
Communications Installer	\$ 30.49	\$ 3.05	\$ 0.91	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 44.68
Utility Technician	\$ 31.49	\$ 3.15	\$ 0.94	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.81
Utility Person	\$ 30.49	\$ 3.05	\$ 0.91	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 44.68
Storekeeper	\$ 32.44	\$ 3.24	\$ 0.97	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 46.89
Arborist	\$ 31.04	\$ 3.10	\$ 0.93	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.30

**Schedule "C"
Wages and Benefits
Effective May 1, 2017***

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Health & Welfare	Training	Project Admin Fund	Pension	NETCO Fund	Retention & Promotion	Gross Hourly Rate
Journeyman Power Line Technician	\$ 38.41	\$ 3.84	\$ 1.15	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 53.63
Journeyman Electrician	\$ 41.94	\$ 4.19	\$ 1.26	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 57.62
Journeyman Civil	\$ 37.58	\$ 3.76	\$ 1.13	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 52.70
Journeyman Mechanical I	\$ 41.08	\$ 4.11	\$ 1.23	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 56.65
Journeyman Mechanical II	\$ 39.08	\$ 3.91	\$ 1.17	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 54.39
Heavy-Duty Mechanic Technician	\$ 39.08	\$ 3.91	\$ 1.17	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 54.39
Crane Operator	\$ 40.58	\$ 4.06	\$ 1.22	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 56.09
Heavy Equipment Operator	\$ 36.08	\$ 3.61	\$ 1.08	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 51.00
Light Equipment Operator	\$ 35.08	\$ 3.51	\$ 1.05	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 49.87
Blaster/Driller/Compressor Operator	\$ 36.08	\$ 3.61	\$ 1.08	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 51.00
Mechanic Helper	\$ 33.26	\$ 3.33	\$ 1.00	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.81
Accommodations Maintenance Person	\$ 33.26	\$ 3.33	\$ 1.00	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.81
Communications Installer	\$ 32.26	\$ 3.23	\$ 0.97	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 46.68
Utility Technician	\$ 33.26	\$ 3.33	\$ 1.00	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.81
Utility Person	\$ 32.26	\$ 3.23	\$ 0.97	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 46.68
Storekeeper	\$ 34.21	\$ 3.42	\$ 1.03	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.89
Arborist	\$ 32.81	\$ 3.28	\$ 0.98	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.30

* If construction not complete by April 30, 2018, will negotiate new rate on or before that date and in the event the parties fail to reach an agreement, submit to arbitration

SCHEDULE "C"**CLASSIFICATIONS AND RATES OF PAY**

APPRENTICES	RATE
Apprentice 4 th Year	90% of JP Rate
Apprentice 3 rd Year	80% of JP Rate
Apprentice 2 nd Year	70% of JP Rate
Apprentice 1 st Year	60% of JP Rate

The working foreperson shall be paid a premium of two dollars (\$2.00) per hour worked, which premium will increase as follows:

May 1, 2014 - \$2.25

May 1, 2016 - \$2.50

The non-working foreperson shall be paid a premium of three dollars and twenty-five cents (\$3.25) per hour worked, which premium will increase as follows:

May 1, 2014 - \$3.50

May 1, 2016 - \$3.75

Note: The following outlines the funds specified in the above wage package.

1. Health and Welfare - one dollar (\$1.00) per hour worked, which shall increase to two dollars and twenty-five cents (\$2.25) per hour worked effective May 1, 2014 as per Article 26.
2. Training - twenty-five cents (\$0.25) per hour worked as per Article 26.
3. Pension – five dollars and eighty cents (\$5.80) per hour worked as per Article 26.
4. Retention and Promotion Fund – one dollar (\$1.00) per hour worked as per Article 26.
5. NETCO Fund - three cents (\$0.03) per hour worked as per Article 27.01.
6. Project Administration Fund - ninety cents (\$0.90) per hour worked as per Article 27.02

SCHEDULE "C.1"
DEFINITION OF CLASSIFICATIONS

Schedule “C.1” – Definition of Classifications

- a) **“Journeyman Power Line Technician”** refers to any employee who is certified and has completed apprenticeship and has the required trade knowledge to perform and does perform all work in connection with the installation, maintenance, testing and repair and dismantling of electrical power generation, transmission and distribution system equipment, lines, apparatus and substations.
- b) **“Journeyman Electrician”** refers to any employee who is certified and has completed apprenticeship as an electrician and who is qualified to layout, assemble, install, test, troubleshoot, maintain and repair industrial electrical equipment and associated electrical and electronic controls, electrical wiring, fixtures, control devices and related equipment in buildings and other structures.
- c) **“Journeyman Civil”** refers to any employee who is certified and has completed apprenticeship as a: carpenter; scaffolder; rod person (rebar); bricklayer; welder; plasterer, drywall installer and finisher; glazier and painter/decorator; cook.
- d) **“Journeyman Mechanical I”** refers to any employee who is certified and has completed apprenticeship as a: structural ironworker; sheet metal worker; steamfitter, pipefitter and sprinkler system installer; plumber; elevator constructor/mechanic.
- e) **“Journeyman Mechanical II”** refers to any employee who is certified and has completed apprenticeship as a: millwright; boilermaker; heat and frost insulator.
- f) **“Heavy-Duty Equipment Technician”** refers to any employee who is certified and completed apprenticeship and is qualified to diagnose, repair, adjust, overhaul, maintain and test mobile heavy-duty equipment.
- g) **“Crane Operator”** refers to any employee who is certified, has completed apprenticeship and is qualified to operate mobile and crawler cranes to lift, move, position or place machinery, equipment and other large objects at construction or industrial sites.
- h) **“Heavy Equipment Operator”** refers to any employee who is certified and/or has completed apprenticeship and is qualified to operate: boom trucks, excavators, bulldozers, loaders, backhoes, graders, tractors (with attachments), trenching machines, feller-buncher, harvester, delimeter / processor operator and mulcher.
- i) **“Light Equipment Operator”** refers to any employee who is certified and is qualified to operate: single-axle trucks, double-axle trucks, dump trucks, rock trucks, digger trucks, line trucks, buses, pickups, crewcabs, lowbed trucks, tandem trucks, cat trucks, fork lift, skidder operator, grapple skidder operator, muskeg, and forwarders.
- j) **“Blaster/Driller/Compressor Operator”** includes any employee who fill blast holes with explosives and detonate explosives to dislodge coal, ore and rock or to demolish structures and is certified and holds a valid blasters certificate for the class applicable for the work being performed and/or any employee who operates mobile drilling machines to bore holes in quarries and to bore holes for blasting and for building foundations at construction sites and/or manage, operate and maintain compression systems of different types and sizes.

- k) **“Mechanic Helper”** refers to any employee who is qualified to repair, troubleshoot, adjust, overhaul, maintain vehicles and equipment, and assist Heavy-Duty Equipment Technicians.
- l) **“Accommodations Maintenance Person”** refers to any employee who has the necessary skills and qualifications to provide maintenance services at the Accommodations Complex.
- m) **“Communications Installer”** refers to any employee who is skilled and has the required trade knowledge to perform all work in connection with the installation and maintenance of communications networks.
- n) **“Utility Technician”** refers to any employee who performs at ground level all work in connection with the construction, dismantling or maintenance of transmission and distribution lines and sub stations, and also performs general labour work when required.
- o) **“Utility Person”** refers to any employee who is employed as a general labourer; controls and directs vehicle traffic; smooths and finishes concrete; clearing and laydown labourer; housekeeping and accommodations attendant; catering server.
- p) **“Storekeeper”** refers to any employee who is qualified and responsible for the requisitioning, handling and dispatching of materials.
- q) **“Apprentice”** refers to any employee who is indentured into an accredited apprenticeship program which upon successful completion will be qualified as a Journeyman.
- r) **“Arborist”** means any employee who is certified for tree trimming from poles or aerial devices to provide clearances from distribution lines along highways, streets, roads, etc.
- s) **“Other Classifications”** The Association may create such other classifications as it deems necessary for the Project. Upon creating such classification the Association shall have consultation with the Union in regards to the new job classification. Within fourteen (14) days of such consultation, the Association and Union shall meet to negotiate a Gross Hourly Package for such classification. In the event the parties are unable to agree to the Gross Hourly Package for the new classification, such dispute shall be referred to the grievance and arbitration process contained herein for resolution. An arbitrator shall have no jurisdiction to award a Gross Hourly Package higher than the highest Gross Hourly Package specified on Schedule C for that year. All subsequent increases in the Gross Hourly Package for the new job classification shall be in accordance with the Agreement.

SCHEDULE "D"
LIST OF ARBITRATORS

Schedule "D" – List of Arbitrators

1. Morgan Cooper
2. John Roil
3. James Oakley
4. Wayne Thistle
5. Robert Andrews
6. John Clarke

SCHEDULE "E"
OWNER / OPERATOR

Schedule "E" – Owner / Operator

1. The purpose of this Schedule is to set out the terms and conditions for Contractor(s) to retain Owner/Operators of clearing machinery, trucks or other equipment (collectively referred to as "Equipment") to work on the Project. If there is a conflict between the terms and conditions contained in Articles 1 to 39 of the Agreement and the terms and conditions of this Schedule, the terms and conditions in this Schedule shall prevail.
2. Owner/Operator, for the purposes of the Agreement, shall mean any person who owns, leases or rents and operates equipment who has been retained by a Contractor to work on the Project. Person, for the purposes of this Schedule, shall include any individual, firm, business, partnership or corporate entity that owns, leases or rents the Equipment that has been retained by the Contractor, which individual, firm, business, partnership or corporate entity is controlled by the person who operates the Equipment.
3. Notwithstanding Article 7.08 of this Agreement or any other provision of the Agreement, the retention of Owner/Operators shall be done at the sole discretion of each Contractor. In exercising its discretion, each Contractor must be in compliance where required with the Benefits Strategy and where required shall give preference in hiring to qualified Innu Owner/Operators for the Labrador portion of the Project.
4. Notwithstanding Article 30 of the Agreement or any other Article, a Contractor may discontinue the services of an Owner/Operator at any time.
5. The total compensation and benefits, paid to Owner/Operators for Equipment shall be determined by the Contractor and subject to the prior written approval of the Association (the "Owner/Operator Compensation"). The Owner/Operator Compensation shall be determined prior to the commencement of work by Owner/Operators and may be changed at any time during the term of this Agreement, subject to the prior written approval of the Association. Owner/Operators shall not be entitled to any financial compensation and benefits as contained within the Agreement, except as provided for in this Schedule "E".
6. All Owner/Operators will be represented by the Union and shall pay a permit fee to the Union, which permit fee shall be one hundred dollars (\$100.00) per month.
7. Articles 7, 10, 19 - 35, 37, Schedule C, C.1, F, G and H of the Agreement shall not apply to Owner/Operators.
8. All work shall be performed and equipment operated in accordance with the *Occupational Health and Safety Act*.
9. The hours of operation of Equipment for Owner/Operators shall be determined by the Contractor and subject to the approval of the Association.
10. The Contractor shall save the Association and Union harmless from any and all causes of action, claims or demands of any nature or kind, including but not limited to expenses, costs, legal fees and disbursements, that may be made against the Union and/or Association for amounts due and owing by the Contractor to the Owner/Operator.

11. The Contractor may, subject to the prior written approval of the Association, develop policies, procedures, rules, regulations, working conditions, terms or standards in relation to the Equipment and the Owner/Operator's work on the Project (collectively referred to as the "Owner/Operator Regulations") which may be amended from time to time, subject to the prior written approval of the Association. The Owner/Operator Regulations shall include but are not limited to the following:
- a) Owner/Operators shall comply with all site standards, rules, regulations, policies and procedures as developed and amended by the Association from time to time.
 - b) Contractor(s) may provide fuel to Owner/Operators, which fuel and delivery costs may be deducted from the Owner/Operator Compensation.
 - c) The Contractor(s) shall have the right to require an inspection(s) of Equipment before Equipment comes onto a Project work site and/or an Owner/Operator commences work or at any time during the Project. Any Equipment not in good working condition will not be permitted on a work site and/or will not be permitted to commence work or continue to work. All Equipment must be equipped with back up alarms, flashing lights or any other equipment or device required by Occupational Health & Safety legislation or other applicable provincial legislation, the Contractor and/or Association.
 - d) Owner/Operators shall maintain, with each piece of Equipment, a fire extinguisher, first aid kit or any other safety devices required by Occupational Health & Safety legislation or other applicable provincial legislation, the Contractor and/or Association.
 - e) Owner/Operators can request the Contractor to do normal routine maintenance from any maintenance facility on the Project, (eg. belts, hoses, tires). Subject to available facilities and resources on the Project, the Contractor may provide these services to Owner/Operators. The labour and all other costs or expense associated with all repairs and/or maintenance will be charged to each Owner/Operator and deducted from the Owner/Operator Compensation. Owner/Operators are responsible for all repair and maintenance costs.
 - f) Owner/Operators will be required to obtain a medical assessment as determined by the Association from time to time, prior to commencing work on the Project and shall be required to comply with all Project safety standards, policies, procedures, rules and regulations as determined by the Association.
 - g) Owner/Operators will be required to participate in Project orientation developed for Owner/Operators, prior to commencing work on the Project.
 - h) Contractor(s) shall not be responsible to compensate Owner/Operators for any costs, expenses, charges, damages or lost compensation or benefits of any nature or kind as a result of downtime to Equipment caused by required maintenance or repairs or waiting for maintenance or repairs or any other reason.
 - i) Contractor(s) have the right to select or determine the nature, type, size or any other specifications of Equipment before the Owner/Operators commences work.

- j) Owner/Operators must provide to the Contractor and/or the Association, upon request, proof of Equipment registration, proof of registration and good standing with Workplace, Health, Safety & Compensation Commission, proof of Equipment insurance, proof of liability insurance in an amount to be determined by the Contractor and subject to the approval of the Association, and inspection certificates when requested.

SCHEDULE "F"
**ACCOMMODATIONS, CLEARING OPERATIONS, DESIGNATED
LAYDOWN AREA, TRANSPORTATION, MEDICAL ATTENDANT
CLASSIFICATIONS AND ANY OTHER CLASSIFICATIONS AGREED BY
THE PARTIES**

Schedule "F" – Accommodations, Clearing Operations, Designated Laydown Area, Transportation, Medical Attendant Classifications and Any Other Classifications Agreed by the Parties

1. This Schedule is applicable to accommodation classifications, clearing operations classifications, designated laydown area classifications, transportation classifications, medical attendant classifications, and any other classifications agreed to by the Association and the Union. The terms and conditions of the Agreement shall apply to the classifications set out in Paragraph 2 below unless otherwise specified in Schedule "F".
2. The classifications shall include:
 - a) Cook
 - b) 2nd Cook
 - c) Accommodations Attendant
 - d) Accommodations Maintenance Person
 - e) Truck Driver Tandem
 - f) Truck Driver Double Tandem
 - g) Bus Driver
 - h) Heavy Equipment Mechanic
 - i) Labourer Clearing
 - j) Labourer Laydown
 - k) Forestry Equipment Operator - refers to any employee who is certified and/or qualified to operate a feller-buncher, harvester, forwarder, mulcher, delimeter / processor and any other forestry equipment
 - l) Muskeg Operator
 - m) Skidder Operator / Grapple Skidder Operator
 - n) Crane Operator
 - o) Rigger (trade specific)
 - p) Fork Lift Operator
 - q) Storekeeper (Warehouse Person)

- r) Emergency Medical Attendants
 - s) Duty Nurse
 - t) Construction Surveyor / Instrument Technician
 - u) Such other classifications as are necessary for accommodation classifications, clearing operations classifications, designated laydown area classifications, transportation classifications, or medical attendant classifications or any classification created pursuant to Schedule C.1(s)
3. The gross hourly rate for each classification in Paragraph 2 is set out below with the exception of Emergency Medical Attendants, Duty Nurse and Construction Surveyor / Instrument Technician which shall be determined by the Association, upon considering market conditions and after consultation with the Union.
 4. Notwithstanding Article 7 in the Agreement, all hiring for classifications covered by Schedule "F" shall be done at the sole discretion of each Contractor(s). In exercising its discretion each Contractor must be in compliance with the Benefits Strategy and provide preference in hiring to qualified Labrador Innu for the Labrador portion of the Project.
 5. All workers hired pursuant to Schedule "F" must complete the pre-employment training and orientation as per Article 7.09(a)(i) for forepersons and 7.09(b)(i) for all other workers.
 6. All workers hired pursuant to Schedule "F", shall be represented by the Union and pay initiation fees, dues and other assessments after hiring as per Article 6 of the Agreement.

Gross Hourly Rate IBEW 1620 - May 1, 2013					
CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Add-Ons	Gross Hourly Rate
Cook	\$ 30.50	\$ 3.05	\$ 0.92	\$ 8.98	\$ 43.45
Crane Operator	\$ 33.50	\$ 3.35	\$ 1.01	\$ 8.98	\$ 46.84
Heavy Equipment Mechanic	\$ 32.00	\$ 3.20	\$ 0.96	\$ 8.98	\$ 45.14
Feller-buncher, Mulcher, Harvester, Delimber / Processor Operator	\$ 29.00	\$ 2.90	\$ 0.87	\$ 8.98	\$ 41.75
Fork-Lift, Muskeg, Skidder Operator, Grapple Skidder Operator, Forwarder, Truck Driver Tandum, Truck Driver Double Tandum, Bus Driver	\$ 28.00	\$ 2.80	\$ 0.84	\$ 8.98	\$ 40.62
Accommodations Maintenance Person	\$ 26.18	\$ 2.62	\$ 0.79	\$ 8.98	\$ 38.56
Labourer Clearing, Labourer Laydown, Accommodations Attendant, Server, Housekeeping	\$ 25.18	\$ 2.52	\$ 0.76	\$ 8.98	\$ 37.43
Storekeeper (Warehouse Person)	\$ 27.13	\$ 2.71	\$ 0.81	\$ 8.98	\$ 39.64

Gross Hourly IBEW 1620 - May 1, 2014					
CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Add-Ons	Gross Hourly Rate
Cook	\$ 32.27	\$ 3.23	\$ 0.97	\$ 10.23	\$ 46.70
Crane Operator	\$ 35.27	\$ 3.53	\$ 1.06	\$ 10.23	\$ 50.09
Heavy Equipment Mechanic	\$ 33.77	\$ 3.38	\$ 1.01	\$ 10.23	\$ 48.39
Feller-buncher, Mulcher, Harvester, Delimber / Processor Operator	\$ 30.77	\$ 3.08	\$ 0.92	\$ 10.23	\$ 45.00
Fork-Lift, Muskeg, Skidder Operator, Grapple Skidder Operator, Forwarder, Truck Driver Tandum, Truck Driver Double Tandum, Bus Driver	\$ 29.77	\$ 2.98	\$ 0.89	\$ 10.23	\$ 43.87
Accommodations Maintenance Person	\$ 27.95	\$ 2.79	\$ 0.84	\$ 10.23	\$ 41.81
Labourer Clearing, Labourer Laydown, Accommodations Attendant, Server, Housekeeping	\$ 26.95	\$ 2.69	\$ 0.81	\$ 10.23	\$ 40.68
Storekeeper (Warehouse Person)	\$ 28.90	\$ 2.89	\$ 0.87	\$ 10.23	\$ 42.89

Gross Hourly Rate IBEW 1620 - May 1, 2015					
CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Add-Ons	Gross Hourly Rate
Cook	\$ 34.04	\$ 3.40	\$ 1.02	\$ 10.23	\$ 48.70
Crane Operator	\$ 37.04	\$ 3.70	\$ 1.11	\$ 10.23	\$ 52.09
Heavy Equipment Mechanic	\$ 35.54	\$ 3.55	\$ 1.07	\$ 10.23	\$ 50.39
Feller-buncher, Mulcher, Harvester, Delimber / Processor Operator	\$ 32.54	\$ 3.25	\$ 0.98	\$ 10.23	\$ 47.00
Fork-Lift, Muskeg, Skidder Operator, Grapple Skidder Operator, Forwarder, Truck Driver Tandum, Truck Driver Double Tandum, Bus Driver	\$ 31.54	\$ 3.15	\$ 0.95	\$ 10.23	\$ 45.87
Accommodations Maintenance Person	\$ 29.72	\$ 2.97	\$ 0.89	\$ 10.23	\$ 43.81
Labourer Clearing, Labourer Laydown, Accommodations Attendant, Server, Housekeeping	\$ 28.72	\$ 2.87	\$ 0.86	\$ 10.23	\$ 42.68
Storekeeper (Warehouse Person)	\$ 30.67	\$ 3.07	\$ 0.92	\$ 10.23	\$ 44.89

Gross Hourly Rate IBEW 1620 - May 1, 2016					
CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Add-Ons	Gross Hourly Rate
Cook	\$ 35.81	\$ 3.58	\$ 1.07	\$ 10.23	\$ 50.70
Crane Operator	\$ 38.81	\$ 3.88	\$ 1.16	\$ 10.23	\$ 54.09
Heavy Equipment Mechanic	\$ 37.31	\$ 3.73	\$ 1.12	\$ 10.23	\$ 52.39
Feller-buncher, Mulcher, Harvester, Delimber / Processor Operator	\$ 34.31	\$ 3.43	\$ 1.03	\$ 10.23	\$ 49.00
Fork-Lift, Muskeg, Skidder Operator, Grapple Skidder Operator, Forwarder, Truck Driver Tandum, Truck Driver Double Tandum, Bus Driver	\$ 33.31	\$ 3.33	\$ 1.00	\$ 10.23	\$ 47.87
Accommodations Maintenance Person	\$ 31.49	\$ 3.15	\$ 0.94	\$ 10.23	\$ 45.81
Labourer Clearing, Labourer Laydown, Accommodations Attendant, Server, Housekeeping	\$ 30.49	\$ 3.05	\$ 0.91	\$ 10.23	\$ 44.68
Storekeeper (Warehouse Person)	\$ 32.44	\$ 3.24	\$ 0.97	\$ 10.23	\$ 46.89

Gross Hourly Rate IBEW 1620 - May 1, 2017					
CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Add-Ons	Gross Hourly Rate
Cook	\$ 37.58	\$ 3.76	\$ 1.13	\$ 10.23	\$ 52.70
Crane Operator	\$ 40.58	\$ 4.06	\$ 1.22	\$ 10.23	\$ 56.09
Heavy Equipment Mechanic	\$ 39.08	\$ 3.91	\$ 1.17	\$ 10.23	\$ 54.39
Feller-buncher, Mulcher, Harvester, Delimber / Processor Operator	\$ 36.08	\$ 3.61	\$ 1.08	\$ 10.23	\$ 51.00
Fork-Lift, Muskeg, Skidder Operator, Grapple Skidder Operator, Forwarder, Truck Driver Tandum, Truck Driver Double Tandum, Bus Driver	\$ 35.08	\$ 3.51	\$ 1.05	\$ 10.23	\$ 49.87
Accommodations Maintenance Person	\$ 33.26	\$ 3.33	\$ 1.00	\$ 10.23	\$ 47.81
Labourer Clearing, Labourer Laydown, Accommodations Attendant, Server, Housekeeping	\$ 32.26	\$ 3.23	\$ 0.97	\$ 10.23	\$ 46.68
Storekeeper (Warehouse Person)	\$ 34.21	\$ 3.42	\$ 1.03	\$ 10.23	\$ 48.89

2nd Cook shall receive 90% of the Gross Hourly Rate applicable to the Cook

**SCHEDULE "G"
TOOL LIST**

Schedule "G" – Tool List**Power Line Technician/Apprentice**

- 1 Canvas Tool Bag
- 1 Pliers Pouch
- 1 Bolt Bag (Canvas)
- 1 10" Crescent/Adjustable Wrench
- 1 12" Crescent/Adjustable Wrench
- 1 Ratchet and Sockets (½" Drive)
- 1 Ball Peen Hammer (2 lbs.)
- 1 9" Linesman/Klien Pliers
- 1 Hand Line (other to be supplied by the Employer)
- 1 Straight End Screwdriver (14")
- 1 Screwdriver (10" or 12")
- 1 Skinning Knife
- 1 3' Wooden Rule (all others to be supplied by the Employer)
- 1 12' Non-Metallic Tape Measure (all others to be supplied by the Contractor)
- 1 Line Level
- 1 Spud Wrench (15/16")

Electrician/Apprentice

- 1 Tool Box
- 1 Belt and Pouch
- 1 Needle Nose Plier
- 1 8" Linesman Pliers
- 1 Side Cutting Pliers
- 1 Channel Locks
- 1 Hacksaw Frame
- 3 Straight Head Screwdrivers
- 3 Robertson Head Screwdrivers, #6, 8 and 10
- 3 Phillips Head Screwdrivers, #6, 8 and 10
- 1 Set Allen Key Wrenches up to ½"
- 1 Measuring Tape (12 feet)
- 1 Knife
- 1 Claw Hammer
- 1 Ball Peen Hammer
- 1 10" Pipe Wrench
- 1 Set Socket Head Drivers or Nut Drivers
- 1 Box End Wrenches or Adjustable Wrench
- 1 Flashlight
- 1 Meter A/C, Amps/Volts/Ohms
- 1 Metal Rule, 3 Meter Minimum

For all other trade classifications, employees shall provide the regular tools of the trade which are reasonably necessary to perform the required work, as specified by the Contractor.

SCHEDULE "H"
EXTENDED WORK SCHEDULES

WORK SCHEDULE A: TEN (10) DAYS ON / FOUR (4) DAYS OFF

The following terms and conditions apply to employees, who work this schedule:

- a) The Work Schedule may commence on any day of the week.
- b) The Work Schedule will consist of ten (10) consecutive scheduled days of work followed by four (4) scheduled days of rest. Each work day will consist of a shift of ten (10) regularly scheduled hours of work.
- c) The scheduled hours to be worked and the scheduled hours to be paid (straight time and overtime) are detailed in Table A.
- d) Work performed outside of the ten (10) regularly scheduled hours of work in a scheduled day of work or on a scheduled day of rest will be paid as per the provisions of this Agreement.
- e) An employee, who is transferred to a different Work Schedule, must be provided with notice as per the provisions of this Agreement. If an employee requests a transfer and it is approved, then overtime rates will not apply for days worked in the scheduled four (4) days of rest, unless any of the ensuing days worked in the new Work Schedule are a Friday, Saturday, Sunday or Recognized Holiday in which case the applicable over-time rate will apply. If the transfer is not as a result of an employee request, overtime provisions will apply for days worked on the scheduled days of rest that the employee would have been entitled to under his/her previous schedule.
- f) Overtime meals will be as per the provisions of this Agreement.
- g) The hours set forth in this Work Schedule do not constitute a guarantee of hours of work per day.

Table A: Ten and Four Work Schedule (Ten days of 10 hours worked, 4 days off)

DAY	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su
ST	10	10	10	10				10	10	10				
1.5 T					10	10								
2.0 T							10							

WORK SCHEDULE B: FOURTEEN (14) DAYS ON / SEVEN (7) DAYS OFF

The following terms and conditions apply to employees, who work this schedule:

- a) The Work Schedule may commence on any day of the week.
- b) The Work Schedule will consist of fourteen (14) consecutive scheduled days of work followed by seven (7) scheduled days of rest. Each work day will consist of a shift of ten (10) regularly scheduled hours of work.
- c) The scheduled hours to be worked and the scheduled hours to be paid (straight time and overtime) are detailed in Table B.
- d) Work performed outside of the ten (10) regularly scheduled hours of work in a scheduled day of work or on a scheduled day of rest will be paid as per the provisions of this Agreement.
- e) An employee, who is transferred to a different Work Schedule, must be provided with notice as per the provisions of this Agreement. If an employee requests a transfer and it is approved, then overtime rates will not apply for days worked in the scheduled seven (7) days of rest, unless any of the ensuing days worked in the new Work Schedule are a Friday, Saturday, Sunday or Recognized Holiday in which case the applicable over-time rate will apply. If the transfer is not as a result of an employee request, overtime provisions will apply for days worked on the scheduled days of rest that the employee would have been entitled to under his/her previous schedule.
- f) Overtime meals will be as per the provisions of this Agreement.
- g) The hours set forth in this Work Schedule do not constitute a guarantee of hours of work per day.

Table B: Fourteen and Seven Work Schedule (14 days of 10 hours worked, 7 days off)

DAY	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	
ST	10	10	10	10				10	10	10	10											
1.5T					10	10						10	10									
2.0T							10							10								

WORK SCHEDULE C: FOURTEEN (14) DAYS ON / FOURTEEN DAYS (14) DAYS OFF

The following terms and conditions apply to employees, who work this schedule:

- a) The Work Schedule may commence on any day of the week.
- b) The Work Schedule will consist of fourteen (14) consecutive scheduled days of work followed by fourteen (14) scheduled days of rest. Each work day will consist of a shift of ten (10) regularly scheduled hours of work.
- c) The scheduled hours to be worked and the scheduled hours to be paid (straight time and overtime) are detailed in Table C.
- d) Work performed outside of the ten (10) regularly scheduled hours of work in a scheduled day of work or on a scheduled day of rest will be paid as per the provisions of this Agreement.
- e) An employee, who is transferred to a different Work Schedule, must be provided with notice as per the provisions of this Agreement. If an employee requests a transfer and it is approved, then overtime rates will not apply for days worked in the scheduled fourteen (14) days of rest, unless any of the ensuing days worked in the new Work Schedule are a Friday, Saturday, Sunday or Recognized Holiday in which case the applicable over-time rate will apply. If the transfer is not as a result of an employee request, overtime provisions will apply for days worked on the scheduled days of rest that the employee would have been entitled to under his/her previous schedule.
- f) Overtime meals will be as per the provisions of this Agreement.
- g) The hours set forth in this Work Schedule do not constitute a guarantee of hours of work per day.

Table C: Fourteen and Fourteen Work Schedule (14 days of 10 hours worked, 14 days off)

Day	M	T	W	T h	F	S	S u	M	T	W	T h	F	S	S u	M	T	W	T h	F	S	S u	M	T	W	T h	F	S	S u
ST	1 0	1 0	1 0	1 0				1 0	1 0	1 0	1 0																	
1.5T					1 0	1 0						1 0	1 0															
2.0T							1 0								1 0													

WORK SCHEDULE D: TWENTY (20) DAYS ON / EIGHT DAYS (8) DAYS OFF

The following terms and conditions apply to employees, who work this schedule:

- a) The Work Schedule may commence on any day of the week.
- b) The Work Schedule will consist of twenty (20) consecutive scheduled days of work followed by eight (8) scheduled days of rest. Each work day will consist of a shift of ten (10) regularly scheduled hours of work.
- c) The scheduled hours to be worked and the scheduled hours to be paid (straight time and overtime) are detailed in Table D.
- d) Work performed outside of the ten (10) regularly scheduled hours of work in a scheduled day of work or on a scheduled day of rest will be paid as per the provisions of this Agreement.
- e) An employee, who is transferred to a different Work Schedule, must be provided with notice as per the provisions of this Agreement. If an employee requests a transfer and it is approved, then overtime rates will not apply for days worked in the scheduled eight (8) days of rest, unless any of the ensuing days worked in the new Work Schedule are a Friday, Saturday, Sunday or Recognized Holiday in which case the applicable over-time rate will apply. If the transfer is not as a result of an employee request, overtime provisions will apply for days worked on the scheduled days of rest that the employee would have been entitled to under his/her previous schedule.
- f) Overtime meals will be as per the provisions of this Agreement.
- g) The hours set forth in this Work Schedule do not constitute a guarantee of hours of work per day.

Table D: Twenty and Eight Work Schedule (20 days of 10 hours worked, 8 days off)

Day	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	
ST	10	10	10	10				10	10	10	10				10	10	10	10											
1.5T					10	10						10	10						10	10									
2.0T							10							10															

WORK SCHEDULE E: TWENTY-ONE (21) DAYS ON / SEVEN DAYS (7) DAYS OFF

The following terms and conditions apply to employees, who work this schedule:

- a) The Work Schedule may commence on any day of the week.
- b) The Work Schedule will consist of twenty-one (21) consecutive scheduled days of work followed by seven (7) scheduled days of rest. Each work day will consist of a shift of ten (10) regularly scheduled hours of work.
- c) The scheduled hours to be worked and the scheduled hours to be paid (straight time and overtime) are detailed in Table E.
- d) Work performed outside of the ten (10) regularly scheduled hours of work in a scheduled day of work or on a scheduled day of rest will be paid as per the provisions of this Agreement.
- e) An employee, who is transferred to a different Work Schedule, must be provided with notice as per the provisions of this Agreement. If an employee requests a transfer and it is approved, then overtime rates will not apply for days worked in the scheduled seven (7) days of rest, unless any of the ensuing days worked in the new Work Schedule are a Friday, Saturday, Sunday or Recognized Holiday in which case the applicable over-time rate will apply. If the transfer is not as a result of an employee request, overtime provisions will apply for days worked on the scheduled days of rest that the employee would have been entitled to under his/her previous schedule.
- f) Overtime meals will be as per the provisions of this Agreement.
- g) The hours set forth in this Work Schedule do not constitute a guarantee of hours of work per day.

Table E: Twenty-one and Seven Work Schedule (21 days of 10 hours worked, 7 days off)

Day	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	
ST	1 0	1 0	1 0	1 0				1 0	1 0	1 0	1 0				1 0	1 0	1 0	1 0											
1.5T					1 0	1 0						1 0	1 0						1 0	1 0									
2.0T							1 0							1 0							1 0								

WORK SCHEDULE F: TWENTY-EIGHT (28) DAYS ON / FOURTEEN DAYS (14) DAYS OFF

The following terms and conditions apply to employees, who work this schedule:

- a) The Work Schedule may commence on any day of the week.
- b) The Work Schedule will consist of twenty-eight (28) consecutive scheduled days of work followed by fourteen (14) scheduled days of rest. Each work day will consist of a shift of ten (10) regularly scheduled hours of work.
- c) The scheduled hours to be worked and the scheduled hours to be paid (straight time and overtime) are detailed in Table F.
- d) Work performed outside of the ten (10) regularly scheduled hours of work in a scheduled day of work or on a scheduled day of rest will be paid as per the provisions of this Agreement.
- e) An employee, who is transferred to a different Work Schedule, must be provided with notice as per the provisions of this Agreement. If an employee requests a transfer and it is approved, then overtime rates will not apply for days worked in the scheduled fourteen (14) days of rest, unless any of the ensuing days worked in the new Work Schedule are a Friday, Saturday, Sunday or Recognized Holiday in which case the applicable over-time rate will apply. If the transfer is not as a result of an employee request, overtime provisions will apply for days worked on the scheduled days of rest that the employee would have been entitled to under his/her previous schedule.
- f) Overtime meals will be as per the provisions of this Agreement.
- g) The hours set forth in this Work Schedule do not constitute a guarantee of hours of work per day.

Table F: Twenty-eight and Fourteen Work Schedule (28 days of 10 hours worked, 14 days off)

D	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su		
S	1	1	1	1				1	1	1	1				1	1	1	1																			
T	0	0	0	0																																	
1					1	1																															
S					0	0																															
2							1																														
O							0																														
T																																					

LETTER OF UNDERSTANDING**UNION / ASSOCIATION SITE REPRESENTATIVES**

The Association, Contractors and the Union agree that the designated Union Site Representative and designated Association Site Representative (hereinafter the "Site Representatives") may be provided with accommodations at the Accommodations Complex, referred to in Article 24 (the "Accommodations Complex") when the Site Representative(s) is/are required to travel to and from the Project on Liaison Committee business and the Site Representative(s) permanently resides at a distance of one hundred (100) kilometers, or greater, from the designated reporting point or work location as per Article 19, whichever is the case, to the city or town boundary of the community of the Site Representative's permanent residence, using the most direct route. The provision of accommodations at the Accommodations Complex to the Site Representative(s) shall be subject to availability. Should there be no available accommodations at the Accommodations Complex, the Site Representative(s) shall not be entitled to board allowance as per Article 25.

In the event an overnight stay is required because the Site Representative(s) is/are unable to leave from the designated reporting point or work location due to weather or other circumstances beyond the control of the Site Representative(s), the Site Representative(s) may remain in the Accommodations Complex, subject to availability, until the Site Representative(s) is/are able to leave.

The Association and Union shall compensate the Owner, or its designee, in an amount of one hundred and fifty dollars (\$150.00) or such other reasonable amount as is approved by the Association in consultation with the Union, per Site Representative for each night the Site Representative(s) stay(s) at the Accommodation Complex. Should the Site Representative(s) fail to make use of the Accommodations Complex after a request for accommodation has been received and approved, the Union and/or Association, as the case may be, may be charged at the full rate of one hundred and fifty dollars (\$150.00) or such other reasonable amount as is approved by the Association in consultation with the Union, for each night not used and may forfeit their right to accommodations.

Signed at St. John's, Newfoundland and Labrador this 28th day of January, 2013.

INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS

(digital copy of signed agreement)
Phil Flemming

INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS, LOCAL 1620

(digital copy of signed agreement)
Terry Rose

(digital copy of signed agreement)
Don Murphy

LOWER CHURCHILL TRANSMISSION CONSTRUCTION EMPLOYERS' ASSOCIATION INC.

(digital copy of signed agreement)

Lance Clarke
Director

(digital copy of signed agreement)

David Clark
Director

MEMORANDUM OF UNDERSTANDING

BETWEEN

**Lower Churchill Transmission Construction Employer’s Association Inc.
 (“Association”)**

- and -

**International Brotherhood of Electrical Workers and
 IBEW Local Union 1620
 (“IBEW”)**

Re: Gender Equity and Diversity Implementation

The Association and IBEW agree as follows:

1. To support and promote initiatives and plans for employment diversity.
2. To provide full access to employment opportunities for and employment of qualified women and qualified members of underrepresented groups (aboriginals, persons with disabilities and members of visible minorities).
3. To implement proactive programs and practices that contribute to the creation of an inclusive work environment consistent with the policies established for the Project and commitments in the Gender Equity and Diversity Program.
4. To achieve diversity objectives, the Parties have agreed to the name hiring provisions set out in Article 7.08(b) & (c).
5. The Collective Agreement will not frustrate access to employment for underrepresented groups.

AGREED to this day of May, 2013 in the City of St. John’s, in the Province of Newfoundland and Labrador

(digital copy of signed agreement)
 Lower Churchill Transmission Construction
 Employers’ Association Inc.

(digital copy of signed agreement)
 International Brotherhood of Electrical
 Workers

(digital copy of signed agreement)
 IBEW Local Union 1620



67 LeMarchant Road, St. John's, NL A1C 2G9 * tel 1-800 or 709 753-6071 * fax 709-722-5203 * www.ibew1620.com

LETTER OF UNDERSTANDING

Between

Lower Churchill Employers Association ("Association")

And

International Brotherhood of Electrical Workers and Local 1620 ("IBEW and Local Union")

RE: Health and Welfare Fund Adjustment

IT IS HEREBY AGREED THAT the Association, the IBEW and the Local Union recognize based on an evaluation by the administrators of IBEW Local 1620 Benefit Funds that the Health and Welfare deductions as outlined in Schedule "C", Wages and Benefits, effective May 1, 2013, are underfunded by \$1.00 per hour.

THEREFORE the parties agree that to offset this shortage, \$1.00 per hour will be moved from the Pension Fund deduction which is currently at \$5.80 per hour and deposited with the Health and Welfare Fund to show a \$2.00 per hour total contribution, thus leaving the Pension Fund amount showing as \$4.80 per hour total contribution for the period of May 1, 2013 to April 30, 2014 only.

THE PARTIES FURTHER AGREE that Schedule "C", Wages and Benefits effective May 1, 2014 will continue as originally negotiated under the project agreement for each successive year thereafter.

DATE

(digital copy of signed agreement)

Lower Churchill Transmission
Construction Employers' Association
Inc. ("Association")

DATE

(digital copy of signed agreement)

International Brotherhood of Electrical
Workers

DATE

(digital copy of signed agreement)

International Brotherhood of Electrical
Workers and Local 1620

LOWER CHURCHILL TRANSMISSION CONSTRUCTION
EMPLOYERS' ASSOCIATION INC.

MEMORANDUM OF UNDERSTANDING

Between:

Lower Churchill Transmission Construction
Employers' Association Inc.
("Association")

and

International Brotherhood of Electrical Workers and
IBEW Local Union 1620
("Union")

RE: Notice of Sub-Contractors and/or Owner/Operators to be given by Contractor

The Parties have agreed that any sub-contractor and/or Owner/Operator that is engaged by a Contractor to carry out construction work on the Project, such Contractor shall provide thirty (30) days' notice where practical to the Union prior to the sub-contractor and/or Owner/Operator commencing work.

The Association and Union agree as follows:

1. That when any sub-contractor and/or Owner/Operator is engaged by a Contractor to carry out construction work on the Project, such Contractor shall provide thirty (30) days' notice where practical to the Union of the utilization of such sub-contractor and/or Owner/Operator prior to the sub-contractor and/or Owner/Operator commencing work.

AGREED to this 10th day of September, 2013 in the City of St. John's, in the Province of Newfoundland and Labrador.

(digital copy of signed agreement)
Lower Churchill Transmission Construction
Employers' Association Inc.

(digital copy of signed agreement)
International Brotherhood of Electrical Workers

(digital copy of signed agreement)
International Brotherhood of Electrical Workers
Local 1620

LABOUR PROJECT AGREEMENT
(“Project Agreement”)

SUMMARY OF KEY PROVISIONS

Transmission HVdc Components
Lower Churchill Project Transmission Construction (“Project”)
Review for Bidding Process

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1.0 BACKGROUND

The Project Agreement for the Project has been structured to:

- a) Create a framework to support high levels of productivity;
- b) Ensure labour stability; and
- c) Create a compensation structure and other terms and conditions to attract a sufficient workforce.

2.0 BARGAINING AGENT

Previous major projects in the Province have utilized a council of 15 trade unions to execute the work. The 15 unions that form the council each have jurisdiction over a specific type of work, which is only performed by that specific union. These rigid work silos have negatively impacted labour productivity in the Province. To overcome this, we are utilizing a single union, being the International Brotherhood of Electrical Workers and IBEW Local Union 1620 (the "Union"). This Union specializes in the construction of transmission infrastructure and related work. The key contact persons for the Union are Phil Flemming – International Vice President phil_flemming@ibew.org, Mike Powers – International Representative – Atlantic Canada, Newfoundland and Labrador and New Brunswick Michael_power@ibew.org, and Terry Rose – Business Manager/Financial Secretary ibew1620@nl.rogers.com.

3.0 RATIFIED COLLECTIVE AGREEMENT

The Project Agreement has been ratified and was executed by the Lower Churchill Transmission Construction Employers' Association Inc. and the Union on January 28, 2013. The Special Project Order ("SPO") was granted June 17, 2013.

4.0 KEY PROJECT AGREEMENT LANGUAGE

- a) **Hiring** - The parties have agreed to the following hiring parameters:
 - i. **Hourly employees** – Employed in the construction of transmission infrastructure (not including employees listed on Schedule F), the process is as follows: the first worker to be appointed by the Union, who may be the Shop Steward, with the next six (6) workers being name hired or selected by the Contractor from the Union out-of-work list, the Union referring the eighth worker, the Contractor name hiring or selecting the next worker, and so on thereafter.
 - ii. **Hourly employees** – Employees described on Schedule F being employees working in accommodations, clearing operations, designated laydown areas, as medical attendants, or performing transportation shall be hired at the sole discretion of the Contractor. Unions must be informed of hires, which hires must be in compliance with Section 4(b) herein (the requirement to pay union dues and assessments and be represented by the Union).
 - iii. **Supervision** – Contractor has the right to name hire or select from Union out-of-work list all forepersons.

- iv. **Hiring Priority** – in compliance with the IBA and Lower Churchill Project Benefits Strategy (“Benefits Strategy”), employees will be hired or referred in the following priority:
- Qualified Labrador Innu
 - Qualified Residents of Newfoundland and Labrador
- v. **Gender Equity and Diversity Obligations** – Parties have agreed to comply with gender equity and diversity obligations regarding hiring of females and persons from underrepresented groups as per the Benefits Strategy.
- vi. **Out-of-Province Hiring Priority** – In the event workers are unavailable in the Province, parties commit to the following order of priority:
- Qualified Canadian workers who are members of IBEW affiliate locals
 - Qualified Canadian workers
 - Qualified legal residents of the United States who are members of IBEW affiliate locals and who are authorized to enter and work in Canada
 - Other qualified non-Canadian workers who are authorized to enter and work in Canada
- vii. **Temporary Foreign Worker Program (“TFW Program”)** – The Union has agreed to support the TFW Program and execute any documentation reasonably required by the Lower Churchill Transmission Construction Employers’ Association (“Association”) or any application to government to utilize Temporary Foreign Workers (“TFW”) in the event of a labour shortage.
- viii. **Temporary Foreign Worker’s Mobility** – Once employed on the Project, TFWs will be permitted mobility from one contractor on site to another contractor on site, should another contractor on site require the services of such TFW, provided there are no qualified residents of the Province or Canada available.
- b) **Access to Union Membership and Reasonable Union Fees** - The Union is committed to open access to union representation for any qualified workers and accordingly agree as follows:
- i. Every qualified new worker can decide whether or not to join the union, but will be permitted to be on the union’s out-of-work list provided they agree in writing to pay union dues and assessments, and be represented by the union;
 - ii. Union fees must be reasonable;
- c) **Orientation and Training**
- i. **Orientation of Hourly Employees** – The parties have committed to orientating hourly employees prior to persons being employed. The objective is to create a pool of pre-qualified employees in advance for the purposes of engraining the Project culture prior to commencing work on the Project. This will result in a significant cost saving to the Project when compared to previous projects executed in the Province when orientation has occurred after a person is employed. Orientation will include the following subject matter:

- IBEW Code of Excellence
 - Safety and Environment
 - Collective Agreement
 - Dispute Resolution
 - Cultural and Gender Sensitivity
 - Respectful Workplace
 - Productivity
- ii. **Supervisor Training** – The parties have committed to orientating and training potential forepersons prior to being employed. Where persons are promoted to foreperson position, or where training in advance of employment is not practicable, supervisory orientation / training will be provide on the job. The orientation / training will be more enhanced than the orientation provided to hourly employees.

On past projects in the Province, orientation and training is done after an individual has been hired at significant costs to project. The rationale for completing orientation and training where feasible prior to hiring on this Project is to provide an environment more conducive to retaining information about the Project and the Project culture.

- d) **Exclusions** – one of the prime objectives of bargaining was to include in the bargaining unit persons with the appropriate skill set to perform the required work while excluding specialized personnel and specialized types of work. Accordingly, the parties have agreed to the following:
- i. **Classification Exclusions** – On previous projects, administrative staff, general foreperson, security, and document control persons have been included in the bargaining unit. The feedback we received from stakeholders was that these classifications should be excluded. The following classifications are excluded from the bargaining unit: general forepersons and any management personnel above the level of general foreperson, office staff, engineering staff, technical staff, geotechnical personnel, drafting personnel, engineering surveyors, document control persons, security personnel, quality control and visual inspectors.
- ii. **Specialized Work Excluded** – Persons engaged in the supply, installation, termination, and testing of the Marine HVDC cable system crossing the Strait of Belle Isle, including but not limited to associated work from the cable system components in the Transition Compound at Forteau, Labrador, to cable system components in the Transition Compound at Shoal Cove, Newfoundland. This work includes but is not limited to persons engaged in the supply and installation of surge arrestors, terminations, fibre optic system, HVDC cable accessory and spares, land HVDC cable, engineered thermal backfill, transition joint bays, horizontally drilled cable conduits, HVDC marine cable, submarine berm, operation of rock quarry and transportation of materials from such rock quarry.
- e) **Special Project Order** – In Newfoundland and Labrador once a Special Project Order is issued, bargaining rights and commitments under the Project Agreement do not in any way create bargaining rights or obligations for Contractors or Contractor employees not working on the Project, nor shall such bargaining rights or commitments be the basis of support for the creation of any bargaining rights or obligations outside the Project.

- f) **Productivity** - One of the prime objectives of bargaining was to create a Project Agreement which would provide the platform for enhanced levels of productivity. Accordingly, the parties agreed to the following:
- i. **Work Teams** – The Association, Contractors and Union have agreed to the utilization of work teams, which will be composed of different worker classifications with the necessary skills and qualifications required to safely perform and complete work assignments.
 - ii. **Working Foreperson** – The use of working foreperson on major projects has not been permitted by most unions, and only limited use by other unions. Under the Project Agreement, a working foreperson can be utilized on crews of 10 or less workers, with the exception of safety sensitive hotline work and dressing tower work where the use of working forepersons is for crews of 5 employees or less.
 - iii. **Utilization of Apprentices** – The parties have agreed that apprentices may be utilized to the extent permitted by project conditions and law to maximize placement in utilization of apprentices.
- g) **Project Completion / Commissioning** – A common phenomenon at the end of projects is a decrease in labour productivity when the end of a project is in sight. In order to ensure high levels of productivity are maintained, the parties have agreed to the following:
- i. **Duration** –any unit(s), component(s), system(s), equipment or area(s) of the Project may be deemed ready for acceptance by the Owner, or its designate, prior to Mechanical Completion, at which point the Project Agreement ceases to apply.
 - ii. **Commissioning / Final Inspection After Mechanical Completion** – During the commissioning process, Nalcor, EPCM, commissioning contractor or vendor's representative carrying out commissioning work may utilize union members, Owner employees, vendor employees, EPCM employees or commissioning contractor employees who are not members of the bargaining unit. Should Nalcor, EPCM or a commissioning contractor decide to utilize bargaining unit employees during the commissioning process, any of these entities have the right to by-pass the hiring process and select the most appropriate worker to perform the work.
 - iii. **Layoff** – When laying off employees, contractors have the right to retain employees with the appropriate competency and qualifications provided that the hiring priorities are respected and maintained.
- h) **Work Schedules, Hours of Work and Overtime Rates** – The Project Agreement provides for a broad range of flexibility for contractors to create work schedules and hours of work to meet construction needs. The following is a summary of key provisions:
- i. **Day shift** – any start time between 5:00 a.m. and 9:00 a.m. utilizing ten or eight hour shifts, with no restriction on utilization of overtime, provided no more than 16 hours is worked in a 24 hour period. Shifts that do not start between 5:00 a.m. and 9:00 a.m. will attract a three dollar (\$3.00) an hour shift premium.

- ii. **Start of Shift** – The Contractor may designate a reporting point that employees must report to. The Contractor is responsible to provide transportation and compensation to the employee from the reporting point to the job site and back.

If the location of the work is such that the Contractor does not designate a reporting point, employees shall be in attendance at the work location and be prepared to commence work at the scheduled starting time for the respective work schedule(s) and shift(s). Employees shall only be paid when they start work at their designated work location, not the point when they enter the Project.

- iii. **Work Schedules** –The Project Agreement lists a number of schedule options that does not restrict the Contractor from creating whatever work schedule the Contractor deems appropriate, provided Extended Work Schedules are of 10 consecutive days or more and approved by the Association. The work schedules listed in the Project Agreement are as follows:

- 10 days on and 4 days off x 10 hours/day;
- 14 days on and 7 days off x 10 hours/day;
- 14 days on and 14 days off x 10 hours/day;
- 20 days on and 8 days off x 10 hours/day;
- 21 days on and 7 days off x 10 hours/day;
- 28 days on and 14 days off x 10 hours/day.

- i) **Overtime Premiums** – Premiums are triggered as follows:

- i. For a work week consisting of five consecutive eight hour work days, overtime shall be paid as follows:
 - a. All hours worked in excess of eight hours per day – paid at one and one half the straight time rate of pay.
 - b. All hours worked on Saturday – paid at one and one half the straight time rate of pay.
 - c. All hours worked on Sundays and recognized holidays – paid at double the straight time rate of pay.
- ii. For a work week consisting of four consecutive ten hour work days, overtime shall be paid as follows:
 - a. All hours worked in excess of ten hours per day – paid at one and one half the straight time rate of pay.
 - b. All hours worked on Friday and Saturday – paid at one and one half the straight time rate of pay.
 - c. All hours worked on Sundays and recognized holidays – paid at double the straight time rate of pay.

- iii. For Extended Work Schedules, overtime shall be paid as follows:
 - a. All hours worked in excess of ten hours per day – paid at one and one half the straight time rate of pay.
 - b. All hours worked on Friday and Saturday – paid at one and one half the straight time rate of pay.
 - c. All hours worked on Sunday and recognized holidays – paid at double the straight time rate of pay.

- j) **Labour Stability** - One of the guiding principles of all parties was to create a Project Agreement that eliminated or mitigated the risk of labour instability. The following is the language that addresses this issue:
 - i. **Labour Relations Liaison Committee** – the Project Agreement mandates the creation and operation of a Liaison Committee with the prime objective of dealing with all issues proactively and quickly.
 - ii. **Grievance and Arbitration** – a process that creates a strong obligation on all parties to attempt to resolve issues before they become a grievance.
 - iii. **Prohibition on Strikes and Lockouts** – all parties are committed to working proactively for positive labour relations, and are prepared to deal with labour instability quickly and decisively. The parties have agreed to strong language which strictly prohibits strikes, lockouts or work slowdowns. The Project Agreement contains unique language which mandates the termination of individuals that instigate or lead illegal work stoppages, as well as mandates those that participate in illegal work stoppages be terminated unless there are exceptional mitigating circumstances.

- k) **Scope of Work specific to Converter Station: Transmission IBEW Agreement vs. RDC Lower Churchill Hydroelectric Agreement**

The IBEW Agreement does not include:

“Construction activities performed under another Special Project Order issued under Section 70 of the *Labour Relations Act* including but not limited to the construction of the switch yard at the Lower Churchill Hydro Electric Project at Muskrat Falls to the completion of the concrete pad and anchor bolts, and the construction of a converter station to the point the building is mechanically complete and ready to receive the installation of valve halls and related equipment for installation.”

The scope the Agreement for the Lower Churchill Hydroelectric Collective Agreement between the Muskrat Falls Employers’ Association Inc. and the RDC scope of work specific to the converter station is as follows:

“Designated quarries as per the Letter of Understanding, transportation of aggregate and till to the Site from the designated quarries, the construction of the Dams / Spillways, construction of the Powerhouse,

construction of the Switch Yard at Muskrat Falls to the Anchor Bolts, the construction of foundation and envelope of the converter station building (structural steel, exterior cladding and roofing) at Muskrat Falls, bulk excavation of the Site for the Dam and Powerhouse, and construction and operation of the Accommodations Complex."

5.0 GROSS HOURLY RATES / PREMIUMS

The parties have agreed to the following financial provisions:

- a) **Gross Hourly Package ("GHP")** – Classifications listed on Schedule C.1 with the current Gross Hourly Package and increases set out on Schedule C attached hereto.
- b) **Payment of Benefits in GHP and Premiums** – most major projects to date have paid benefits and premiums based on hours earned. For example, if an employee was paid double time for working on a Sunday they would receive double the wage rate, plus double the benefits (health and welfare, pension, etc.). Under the Project Agreement benefits and premiums are **based on hours worked, not hours earned**.

As a result of paying benefits and premiums on hours worked there is a significant cost saving when compared to projects that pay both premiums and benefits on hours earned.

- c) **Premiums** – The following premiums have been agreed to:
 - i. **Labrador Premium** – For work performed in Labrador, a Labrador Premium of \$3.50 per hour for all hours worked . This premium is not part of the wage package and does not attract a vacation pay or recognized holiday pay.
 - ii. **Island Premium** – For work performed in Newfoundland, an Island Premium of \$3.00 per hour for all hours worked. This premium is not part of the wage package and does not attract a vacation pay or recognized holiday pay.
 - iii. **Power Line Technician Premium** – Given the challenge of attracting skilled Power Line Technicians ("PLT") for the Project, PLT's employed and performing work on the Project shall receive a payment of \$6.00 for all hour worked. The PLT's premium is not used in the calculation of overtime, vacation pay or recognized holiday pay.
 - iv. **Shift Premium** - \$3.00 per hour for all hours worked on non-day shift (day shifts may commence any time between 5:00 a.m. – 9.00 a.m., to a maximum of 10 hours).
 - v. **Working Foreperson Premium** – \$2.00 per hour worked, which premium will be increased as follows:
 - May 1, 2014 \$2.25
 - May 1, 2016 \$2.50
 - vi. **Non-Working Foreperson Premium** - \$3.25 per hour worked, which premium will be increased as follows:
 - May 1, 2014 \$3.50

- May 1, 2016 \$3.75

d) **Travelling and Living Out Allowance** – the following has been agreed to:

- i. **Board** – \$100 per day worked, with incremental increases of \$4 per year, with the first increase on May 1, 2013. Board allowance is only paid when Contractor does not supply accommodations for persons who permanently reside 100 km or more from a work location or designated reporting point.
- ii. **Travel Allowance** – is paid for persons travelling 100 km or more via vehicle each turnaround from the Project to their permanent residence, and is paid as follows:
 - Zone 1 (100 – 200 km) - \$90 (round trip);
 - Zone 2 (201 – 300 km) - \$120 (round trip);
 - Zone 3 (301 – 400 km) - \$150 (round trip);
 - Zone 4 (401 – 500 km) - \$220 (round trip);
 - Zone 5 (501+ km) - \$260 (round trip);
- iii. **Air Transportation (Labrador)** – air transportation for work performed in Labrador.

Employees working an Extended Work Schedule for work in Labrador of ten (10) or more consecutive days, whose permanent residence is located outside of Labrador or in an area of Labrador only accessible by air, will be provided by the Contractor, during each Extended Work Schedule turnaround, the following:

- i. For employees whose permanent residence is on the Island of Newfoundland, air transportation to and from St. John's or such other designated hubs on the Island of Newfoundland to Happy Valley-Goose Bay or such other designated hubs in Labrador;
 - ii. For employees whose permanent residence is in Labrador, air transportation to and from designated hubs in Labrador to Happy Valley-Goose Bay or such other designated hubs in Labrador; and
 - iii. For employees whose permanent residence is outside Newfoundland and Labrador, air transportation to and from designated hubs in other parts of Canada to Happy Valley-Goose Bay or such other designated hubs in Labrador.
- iv. **Air Transportation (Newfoundland)** – air transportation for work performed in Newfoundland.

Employees working an Extended Work Schedule for work on the Island of Newfoundland of ten (10) or more consecutive days, whose permanent residence is located outside the Island of Newfoundland, will be provided by the Contractor, during each Extended Work Schedule turnaround, the following:

- i. For employees whose permanent residence is in Labrador, air transportation to and from Happy Valley-Goose Bay or such other designated hubs in Labrador to St. John's or such other designated hubs on the Island of Newfoundland; and

- ii. For employees whose permanent residence is located outside Newfoundland and Labrador, air transportation to and from designated hubs in other parts of Canada or outside Canada to St. John's or such other designated hubs on the Island of Newfoundland.
- v. **Payments in the Event of Travel Disruption** – In the event that an overnight stay is required, while in transit to the Project, because of a disruption in air travel, the Contractor shall provide board allowance for each day the employee is delayed provided such employees permanent residence is 100 km or more from the departing hub and the employee provides proof of a hotel expenditure in a form satisfactory to the Contractor.

In the event an overnight stay is required because an employee is unable to leave from the departing hub near the work location on the employee's scheduled turnaround because of a disruption in air travel, such employee may remain in the Accommodations Complex or other accommodations provided by the Contractor, at no cost, or at the Contractor's discretion, be provided board allowance each day of the disruption until air transportation from the departing hub near the work location is available.

- vi. **Ground Transportation** – The Contractor shall provide ground transportation to and from the work location to the designated hub.
- vii. **Travel Pay** – There is no provision for travel pay under the project agreement.

Schedule “C.1” – Definition of Classifications

- a) **“Journeyman Power Line Technician”** refers to any employee who is certified and has completed apprenticeship and has the required trade knowledge to perform and does perform all work in connection with the installation, maintenance, testing and repair and dismantling of electrical power generation, transmission and distribution system equipment, lines, apparatus and substations.
- b) **“Journeyman Electrician”** refers to any employee who is certified and has completed apprenticeship as an electrician and who is qualified to layout, assemble, install, test, troubleshoot, maintain and repair industrial electrical equipment and associated electrical and electronic controls, electrical wiring, fixtures, control devices and related equipment in buildings and other structures.
- c) **“Journeyman Civil”** refers to any employee who is certified and has completed apprenticeship as a: carpenter; scaffolder; rod person (rebar); bricklayer; welder; plasterer, drywall installer and finisher; glazier and painter/decorator; cook.
- d) **“Journeyman Mechanical I”** refers to any employee who is certified and has completed apprenticeship as a: structural ironworker; sheet metal worker; steamfitter, pipefitter and sprinkler system installer; plumber; elevator constructor/mechanic.
- e) **“Journeyman Mechanical II”** refers to any employee who is certified and has completed apprenticeship as a: millwright; boilermaker; heat and frost insulator.
- f) **“Heavy-Duty Equipment Technician”** refers to any employee who is certified and completed apprenticeship and is qualified to diagnose, repair, adjust, overhaul, maintain and test mobile heavy-duty equipment.
- g) **“Crane Operator”** refers to any employee who is certified, has completed apprenticeship and is qualified to: operate mobile and crawler cranes to lift, move, position or place machinery, equipment and other large objects at construction or industrial sites.
- h) **“Heavy Equipment Operator”** refers to any employee who is certified and/or has completed apprenticeship and is qualified to operate: boom trucks, excavators, bulldozers, loaders, backhoes, graders, tractors (with attachments), trenching machines, feller-buncher, harvester, delimeter / processor operator and mulcher.
- i) **“Light Equipment Operator”** refers to any employee who is certified and is qualified to operate: single-axle trucks, double-axle trucks, dump trucks, rock trucks, digger trucks, line trucks, buses, pickups, crewcabs, lowbed trucks, tandem trucks, cat trucks, fork lift, skidder operator, grapple skidder operator, muskeg, and forwarders.
- j) **“Blaster/Driller/Compressor Operator”** includes any employee who fill blast holes with explosives and detonate explosives to dislodge coal, ore and rock or to demolish structures and is certified and holds a valid blasters certificate for the class applicable for the work being performed and/or any employee who operates mobile drilling machines to bore holes in quarries and to bore holes for blasting and for building foundations at construction sites and/or manage, operate and maintain compression systems of different types and sizes.

- k) **“Mechanic Helper”** refers to any employee who is qualified to repair, troubleshoot, adjust, overhaul, maintain vehicles and equipment, and assist Heavy-Duty Equipment Technicians.
- l) **“Accommodations Maintenance Person”** refers to any employee who has the necessary skills and qualifications to provide maintenance services at the Accommodations Complex.
- m) **“Communications Installer”** refers to any employee who is skilled and has the required trade knowledge to perform all work in connection with the installation and maintenance of communications networks.
- n) **“Utility Technician”** refers to any employee who performs at ground level all work in connection with the construction, dismantling or maintenance of transmission and distribution lines and sub stations, and also performs general labour work when required.
- o) **“Utility Person”** refers to any employee who is employed as a general labourer; controls and directs vehicle traffic; smoothes and finishes concrete; clearing and laydown labourer; housekeeping and accommodations attendant; catering server.
- p) **“Storekeeper”** refers to any employee who is qualified and responsible for the requisitioning, handling and dispatching of materials.
- q) **“Apprentice”** refers to any employee who is indentured into an accredited apprenticeship program which upon successful completion will be qualified as a Journeyman.
- r) **“Arborist”** means any employee who is certified for tree trimming from poles or aerial devices to provide clearances from distribution lines along highways, streets, roads, etc.
- s) **“Other Classifications”** The Association may create such other classifications as it deems necessary for the Project. Upon creating such classification the Association shall have consultation with the Union in regards to the new job classification. Within fourteen (14) days of such consultation, the Association and Union shall meet to negotiate a Gross Hourly Package for such classification. In the event the parties are unable to agree to the Gross Hourly Package for the new classification, such dispute shall be referred to the grievance and arbitration process contained herein for resolution. An arbitrator shall have no jurisdiction to award a Gross Hourly Package higher than the highest Gross Hourly Package specified on Schedule C for that year. All subsequent increases in the Gross Hourly Package for the new job classification shall be in accordance with the Agreement.

Schedule "C"
Wages and Benefits
Effective May 1, 2013

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Health & Welfare	Training	Project Admin Fund	Pension	NETCO Fund	Retention & Promotion	Gross Hourly Rate
Journeyperson Power Line Technician	\$ 31.33	\$ 3.13	\$ 0.94	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 44.38
Journeyperson Electrician	\$ 34.86	\$ 3.49	\$ 1.05	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.37
Journeyperson Civil	\$ 30.50	\$ 3.05	\$ 0.92	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 43.45
Journeyperson Mechanical I	\$ 34.00	\$ 3.40	\$ 1.02	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.40
Journeyperson Mechanical II	\$ 32.00	\$ 3.20	\$ 0.96	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.14
Heavy-Duty Mechanic Technician	\$ 32.00	\$ 3.20	\$ 0.96	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.14
Crane Operator	\$ 33.50	\$ 3.35	\$ 1.01	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 46.84
Heavy Equipment Operator	\$ 29.00	\$ 2.90	\$ 0.87	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 41.75
Light Equipment Operator	\$ 28.00	\$ 2.80	\$ 0.84	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 40.62
Blaster/Driller/Compressor Operator	\$ 29.00	\$ 2.90	\$ 0.87	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 41.75
Mechanic Helper	\$ 26.18	\$ 2.62	\$ 0.79	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 38.56
Accommodations Maintenance Person	\$ 26.18	\$ 2.62	\$ 0.79	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 38.56
Communications Installer	\$ 25.18	\$ 2.52	\$ 0.76	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 37.43
Utility Technician	\$ 26.18	\$ 2.62	\$ 0.79	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 38.56
Utility Person	\$ 25.18	\$ 2.52	\$ 0.76	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 37.43
Storekeeper	\$ 27.13	\$ 2.71	\$ 0.81	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 39.64
Arborist	\$ 25.73	\$ 2.57	\$ 0.77	\$ 1.00	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 38.05

**The Gross Hourly Rates above do not include any of the premiums set out in the Project Agreement, including the Labrador Premium, Working Foreperson Premium, Non-Working Foreperson Premium, Power Line Technician Premium, Shift Premium, or any other premium in the Project Agreement.*

Schedule "C"
Wages and Benefits
Effective May 1, 2014

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Health & Welfare	Training	Project Admin Fund	Pension	NETCO Fund	Retention & Promotion	Gross Hourly Rate
Journeyperson Power Line Technician	\$ 33.10	\$ 3.31	\$ 0.99	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.63
Journeyperson Electrician	\$ 36.63	\$ 3.66	\$ 1.10	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 51.62
Journeyperson Civil	\$ 32.27	\$ 3.23	\$ 0.97	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 46.70
Journeyperson Mechanical I	\$ 35.77	\$ 3.58	\$ 1.07	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.65
Journeyperson Mechanical II	\$ 33.77	\$ 3.38	\$ 1.01	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.39
Heavy-Duty Mechanic Technician	\$ 33.77	\$ 3.38	\$ 1.01	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.39
Crane Operator	\$ 35.27	\$ 3.53	\$ 1.06	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.09
Heavy Equipment Operator	\$ 30.77	\$ 3.08	\$ 0.92	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.00
Light Equipment Operator	\$ 29.77	\$ 2.98	\$ 0.89	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 43.87
Blaster/Driller/Compressor Operator	\$ 30.77	\$ 3.08	\$ 0.92	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.00
Mechanic Helper	\$ 27.95	\$ 2.79	\$ 0.84	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 41.81
Accommodations Maintenance Person	\$ 27.95	\$ 2.79	\$ 0.84	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 41.81
Communications Installer	\$ 26.95	\$ 2.69	\$ 0.81	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 40.68
Utility Technician	\$ 27.95	\$ 2.79	\$ 0.84	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 41.81
Utility Person	\$ 26.95	\$ 2.69	\$ 0.81	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 40.68
Storekeeper	\$ 28.90	\$ 2.89	\$ 0.87	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 42.89
Arborist	\$ 27.50	\$ 2.75	\$ 0.82	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 41.30

**The Gross Hourly Rates above do not include any of the premiums set out in the Project Agreement, including the Labrador Premium, Working Foreperson Premium, Non-Working Foreperson Premium, Power Line Technician Premium, Shift Premium, or any other premium in the Project Agreement.*

Schedule "C"
Wages and Benefits
Effective May 1, 2015

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Health & Welfare	Training	Project Admin Fund	Pension	NETCO Fund	Retention & Promotion	Gross Hourly Rate
Journeyperson Power Line Technician	\$ 34.87	\$ 3.49	\$ 1.05	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 49.63
Journeyperson Electrician	\$ 38.40	\$ 3.84	\$ 1.15	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 53.62
Journeyperson Civil	\$ 34.04	\$ 3.40	\$ 1.02	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.70
Journeyperson Mechanical I	\$ 37.54	\$ 3.75	\$ 1.13	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 52.65
Journeyperson Mechanical II	\$ 35.54	\$ 3.55	\$ 1.07	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.39
Heavy-Duty Mechanic Technician	\$ 35.54	\$ 3.55	\$ 1.07	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.39
Crane Operator	\$ 37.04	\$ 3.70	\$ 1.11	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 52.09
Heavy Equipment Operator	\$ 32.54	\$ 3.25	\$ 0.98	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.00
Light Equipment Operator	\$ 31.54	\$ 3.15	\$ 0.95	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.87
Blaster/Driller/Compressor Operator	\$ 32.54	\$ 3.25	\$ 0.98	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.00
Mechanic Helper	\$ 29.72	\$ 2.97	\$ 0.89	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 43.81
Accommodations Maintenance Person	\$ 29.72	\$ 2.97	\$ 0.89	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 43.81
Communications Installer	\$ 28.72	\$ 2.87	\$ 0.86	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 42.68
Utility Technician	\$ 29.72	\$ 2.97	\$ 0.89	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 43.81
Utility Person	\$ 28.72	\$ 2.87	\$ 0.86	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 42.68
Storekeeper	\$ 30.67	\$ 3.07	\$ 0.92	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 44.89
Arborist	\$ 29.27	\$ 2.93	\$ 0.88	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 43.30

**The Gross Hourly Rates above do not include any of the premiums set out in the Project Agreement, including the Labrador Premium, Working Foreperson Premium, Non-Working Foreperson Premium, Power Line Technician Premium, Shift Premium, or any other premium in the Project Agreement.*

Schedule "C"
Wages and Benefits
Effective May 1, 2016

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Health & Welfare	Training	Project Admin Fund	Pension	NETCO Fund	Retention & Promotion	Gross Hourly Rate
Journeyperson Power Line Technician	\$ 36.64	\$ 3.66	\$ 1.10	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 51.63
Journeyperson Electrician	\$ 40.17	\$ 4.02	\$ 1.21	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 55.62
Journeyperson Civil	\$ 35.81	\$ 3.58	\$ 1.07	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.70
Journeyperson Mechanical I	\$ 39.31	\$ 3.93	\$ 1.18	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 54.65
Journeyperson Mechanical II	\$ 37.31	\$ 3.73	\$ 1.12	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 52.39
Heavy-Duty Mechanic Technician	\$ 37.31	\$ 3.73	\$ 1.12	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 52.39
Crane Operator	\$ 38.81	\$ 3.88	\$ 1.16	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 54.09
Heavy Equipment Operator	\$ 34.31	\$ 3.43	\$ 1.03	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 49.00
Light Equipment Operator	\$ 33.31	\$ 3.33	\$ 1.00	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.87
Blaster/Driller/Compressor Operator	\$ 34.31	\$ 3.43	\$ 1.03	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 49.00
Mechanic Helper	\$ 31.49	\$ 3.15	\$ 0.94	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.81
Accommodations Maintenance Person	\$ 31.49	\$ 3.15	\$ 0.94	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.81
Communications Installer	\$ 30.49	\$ 3.05	\$ 0.91	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 44.68
Utility Technician	\$ 31.49	\$ 3.15	\$ 0.94	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.81
Utility Person	\$ 30.49	\$ 3.05	\$ 0.91	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 44.68
Storekeeper	\$ 32.44	\$ 3.24	\$ 0.97	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 46.89
Arborist	\$ 31.04	\$ 3.10	\$ 0.93	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.30

**The Gross Hourly Rates above do not include any of the premiums set out in the Project Agreement, including the Labrador Premium, Working Foreperson Premium, Non-Working Foreperson Premium, Power Line Technician Premium, Shift Premium, or any other premium in the Project Agreement.*

Schedule "C"
Wages and Benefits
Effective May 1, 2017*

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Health & Welfare	Training	Project Admin Fund	Pension	NETCO Fund	Retention & Promotion	Gross Hourly Rate
Journeyperson Power Line Technician	\$ 38.41	\$ 3.84	\$ 1.15	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 53.63
Journeyperson Electrician	\$ 41.94	\$ 4.19	\$ 1.26	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 57.62
Journeyperson Civil	\$ 37.58	\$ 3.76	\$ 1.13	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 52.70
Journeyperson Mechanical I	\$ 41.08	\$ 4.11	\$ 1.23	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 56.65
Journeyperson Mechanical II	\$ 39.08	\$ 3.91	\$ 1.17	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 54.39
Heavy-Duty Mechanic Technician	\$ 39.08	\$ 3.91	\$ 1.17	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 54.39
Crane Operator	\$ 40.58	\$ 4.06	\$ 1.22	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 56.09
Heavy Equipment Operator	\$ 36.08	\$ 3.61	\$ 1.08	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 51.00
Light Equipment Operator	\$ 35.08	\$ 3.51	\$ 1.05	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 49.87
Blaster/Driller/Compressor Operator	\$ 36.08	\$ 3.61	\$ 1.08	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 51.00
Mechanic Helper	\$ 33.26	\$ 3.33	\$ 1.00	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.81
Accommodations Maintenance Person	\$ 33.26	\$ 3.33	\$ 1.00	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.81
Communications Installer	\$ 32.26	\$ 3.23	\$ 0.97	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 46.68
Utility Technician	\$ 33.26	\$ 3.33	\$ 1.00	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.81
Utility Person	\$ 32.26	\$ 3.23	\$ 0.97	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 46.68
Storekeeper	\$ 34.21	\$ 3.42	\$ 1.03	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.89
Arborist	\$ 32.81	\$ 3.28	\$ 0.98	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.30

*The Gross Hourly Rates above do not include any of the premiums set out in the Project Agreement, including the Labrador Premium, Working Foreperson Premium, Non-Working Foreperson Premium, Power Line Technician Premium, Shift Premium, or any other premium in the Project Agreement.

** If construction not complete by April 30, 2018, will negotiate new rate on or before that date and in the event the parties fail to reach an agreement, submit to arbitration

SCHEDULE "C"**CLASSIFICATIONS AND RATES OF PAY**

APPRENTICES	RATE
Apprentice 4 th Year	90% of JP Rate
Apprentice 3 rd Year	80% of JP Rate
Apprentice 2 nd Year	70% of JP Rate
Apprentice 1 st Year	60% of JP Rate

The working foreperson shall be paid a premium of two dollars (\$2.00) per hour worked, which premium will increase as follows:

May 1, 2014 - \$2.25

May 1, 2016 - \$2.50

The non-working foreperson shall be paid a premium of three dollars and twenty-five cents (\$3.25) per hour worked, which premium will increase as follows:

May 1, 2014 - \$3.50

May 1, 2016 - \$3.75

Note: The following outlines the funds specified in the above wage package.

1. Health and Welfare - one dollar (\$1.00) per hour worked, which shall increase to two dollars and twenty-five cents (\$2.25) per hour worked effective May 1, 2014 as per Article 26.
2. Training - twenty-five cents (\$0.25) per hour worked as per Article 26.
3. Pension – five dollars and eighty cents (\$5.80) per hour worked as per Article 26.
4. Retention and Promotion Fund – one dollar (\$1.00) per hour worked as per Article 26.
5. NETCO Fund - three cents (\$0.03) per hour worked as per Article 27.01.

Project Administration Fund - ninety cents (\$0.90) per hour worked as per Article 27.02

Schedule 'F' – Accommodations, Clearing Operations, Designated Laydown Area, Transportation, Medical Attendant Classifications and Any Other Classifications Agreed by the Parties

1. This Schedule is applicable to accommodation classifications, clearing operations classifications, designated laydown area classifications, transportation classifications, medical attendant classifications, and any other classifications agreed to by the Association and the Union. The terms and conditions of the Agreement shall apply to the classifications set out in Paragraph 2 below unless otherwise specified in Schedule "F".
2. The classifications shall include:
 - t) Cook
 - u) 2nd Cook
 - v) Accommodations Attendant
 - w) Accommodations Maintenance Person
 - x) Truck Driver Tandem
 - y) Truck Driver Double Tandem
 - z) Bus Driver
 - aa) Heavy Equipment Mechanic
 - bb) Labourer Clearing
 - cc) Labourer Laydown
 - dd) Forestry Equipment Operator - refers to any employee who is certified and/or qualified to operate a feller-buncher, harvester, forwarder, mulcher, delimeter / processor and any other forestry equipment
 - ee) Muskeg Operator
 - ff) Skidder Operator / Grapple Skidder Operator
 - gg) Crane Operator
 - hh) Rigger (trade specific)
 - ii) Fork Lift Operator
 - jj) Storekeeper (Warehouse Person)
 - kk) Emergency Medical Attendants
 - ll) Duty Nurse

- mm) Construction Surveyor / Instrument Technician
 - nn) Such other classifications as are necessary for accommodation classifications, clearing operations classifications, designated laydown area classifications, transportation classifications, or medical attendant classifications or any classification created pursuant to Schedule C.1(s)
3. The gross hourly rate for each classification in Paragraph 2 is set out below with the exception of Emergency Medical Attendants, Duty Nurse and Construction Surveyor / Instrument Technician which shall be determined by the Association, upon considering market conditions and after consultation with the Union.
 4. Notwithstanding Article 7 in the Agreement, all hiring for classifications covered by Schedule "F" shall be done at the sole discretion of each Contractor(s). In exercising its discretion each Contractor must be in compliance with the Benefits Strategy and provide preference in hiring to qualified Labrador Innu for the Labrador portion of the Project.
 5. All workers hired pursuant to Schedule "F" must complete the pre-employment training and orientation as per Article 7.09(a)(i) for forepersons and 7.09(b)(i) for all other workers.
 6. All workers hired pursuant to Schedule "F", shall be represented by the Union and pay initiation fees, dues and other assessments after hiring as per Article 6 of the Agreement.

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Important Information

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NEWFOUNDLAND AND LABRADOR REGULATION 68/13

*Lower Churchill Project Transmission Construction
Special Project Order
under the
Labour Relations Act
(O.C. 2013-188)*

(Filed June 17, 2013)

Under the authority of section 70 of the *Labour Relations Act*, the Lieutenant-Governor in Council makes the following Order.

Dated at St. John's, June 17, 2013.

Robert Thompson
Clerk of the Executive Council

REGULATIONS

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Short title

1. This Order may be cited as the *Lower Churchill Project Transmission Construction Special Project Order*.

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Definition

2. In this Order

- (a) "agreement" means the collective agreement dated January 28, 2013 and entered into between the Lower Churchill Transmission Construction Employers' Association Inc., the International Brotherhood of Electrical Workers, and IBEW Local Union 1620; and
- (b) "memorandum of agreement" means the agreement entitled "Memorandum of Agreement to Resolve Disputes as to Overlaps of Scopes of Work in Collective Agreements Designated in Special Project Orders Enacted under Section 70 of the *Labour Relations Act*" dated April 15, 2013 and entered into between the following parties:
 - (i) the Muskrat Falls Employers' Association Inc.,
 - (ii) the Resource Development Trades Council of Newfoundland and Labrador,
 - (iii) the Lower Churchill Transmission Construction Employers' Association Inc.,
 - (iv) the International Brotherhood of Electrical Workers, IBEW Local Union 1620,
 - (v) the Lower Churchill Reservoir Clearing Employers' Association Inc., and
 - (vi) the Labourers' International Union of North America and the Construction and General Labourers' Union, Rock and Tunnels Workers, Local 1208.

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Special project declared

3. It is declared that the undertaking with respect to the construction of transmission, related infrastructure and related activities for the Labrador Island Link and Muskrat Falls to Churchill Falls Link, more particularly described in Schedule A of the agreement, is a special project.

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Scope of work and geographic site

- 4. (1) The scope of work governed by this Order is described in Schedule A of the agreement.
- (2) The geographic site governed by this Order is designated in Schedule B of the agreement.

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Exclusions

5. (1) The scope of construction work under this Order does not include the construction activities performed under the *Lower Churchill Hydroelectric Generation Project Special Project Order*.

(2) The geographic site under this Order does not include the geographic site under the *Lower Churchill Hydroelectric Generation Project Special Project Order* or the *Lower Churchill Reservoir Clearing Special Project Order*.

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Parties who may bargain collectively

6. The parties that may be involved in collective bargaining in relation to employment on the special project are the Lower Churchill Transmission Construction Employers' Association Inc., as the employers' organization acting for and on behalf of all contractors and subcontractors carrying out work on the special project, and International Brotherhood of Electrical Workers and IBEW Local Union 1620, as the union acting for and on behalf of employees employed on the special project.

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Collective agreement

7. The agreement is the collective agreement for the purpose of the special project.

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Dispute resolution

8. The memorandum of agreement is the mechanism for resolving disputes regarding whether a specific geographic site or scope of work is governed by this Order, the *Lower Churchill Hydroelectric Generation Project Special Project Order* or the *Lower Churchill Reservoir Clearing Special Project Order*.

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Gender equity and diversity program

9. This Order acknowledges the commitment contained in Article 5.1 of the Lower Churchill Construction Projects Benefits Strategy with respect to the development and implementation of a Gender Equity and Diversity Program which includes a women's employment plan to satisfy the condition attached to the provincial release from environmental assessment referred to in paragraph 4(j) of the *Lower Churchill Hydroelectric Generation Project Undertaking Order*, Newfoundland and Labrador Regulations 18/12.

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Hiring priority

10. This Order acknowledges that the commitments respecting hiring priority contained in the Lower Churchill Innu Impacts and Benefits Agreement and the Lower Churchill Construction Projects Benefits Strategy have application to the special project.

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Labour Relations Agency liaison

11. This Order acknowledges the commitment of the parties to the agreement to liaise with a representative of the Labour Relations Agency to exchange information on labour relations matters relating to the project.

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Duration of order

12. This order remains in effect for the duration of the work, including mobilization and demobilization by the contractors, or as otherwise provided in the agreement.

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MEMORANDUM

LCP REC NO. [\[CLICK HERE AND TYPE FILE NO.\]](#)

TO: PAT HUSSEY

FROM: DAVID CLARK

SUBJECT: TRANSMISSION CONSTRUCTION COLLECTIVE AGREEMENT SCHEDULE C AND SCHEDULE F GROSS HOURLY PACKAGE AMENDMENTS

DATE: 16-OCTOBER-2013

The Transmission Construction Collective Agreement that was signed with the IBEW on January 28, 2013, which is currently being utilized by Contractors, has the following yearly Gross Hourly Package increases:

2014 - \$2.00

2015 - \$2.00

2016 - \$2.00

2017 - \$2.00

The Tentative Transmission Construction Collective Agreement which was signed on November 14, 2012 contained the Gross Hourly Package set out below, which Gross Hourly Packages should have been contained in the Collective Agreement:

2014 - \$2.50

2015 - \$2.00

2016 - \$2.50

2017 - \$2.00

Accordingly, attached are revised Schedules C and F reflecting the correct Gross Hourly Package increases being \$2.50 for the years 2014 and 2016 and \$2.00 for the years 2015 and 2017.

In addition, on Schedules C and F for the year 2013, a Letter of Understanding was signed amending the distribution of the add-ons. This is reflected in Schedule "C" Classifications and Rates of Pay section of the Agreement.

Schedule "C"
Wages and Benefits
As of May 1, 2013

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Health & Welfare	Training	Project Admin Fund	Pension	NETCO Fund	Retention & Promotion	Gross Hourly Rate
Journeyperson Power Line Technician	\$ 31.33	\$ 3.13	\$ 0.94	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 44.38
Journeyperson Electrician	\$ 34.86	\$ 3.49	\$ 1.05	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 48.37
Journeyperson Civil	\$ 30.50	\$ 3.05	\$ 0.92	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 43.45
Journeyperson Mechanical I	\$ 34.00	\$ 3.40	\$ 1.02	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 47.40
Journeyperson Mechanical II	\$ 32.00	\$ 3.20	\$ 0.96	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 45.14
Heavy-Duty Mechanic Technician	\$ 32.00	\$ 3.20	\$ 0.96	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 45.14
Crane Operator	\$ 33.50	\$ 3.35	\$ 1.01	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 46.84
Heavy Equipment Operator	\$ 29.00	\$ 2.90	\$ 0.87	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 41.75
Light Equipment Operator	\$ 28.00	\$ 2.80	\$ 0.84	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 40.62
Blaster/Driller/Compressor Operator	\$ 29.00	\$ 2.90	\$ 0.87	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 41.75
Mechanic Helper	\$ 26.18	\$ 2.62	\$ 0.79	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 38.56
Accommodations Maintenance Person	\$ 26.18	\$ 2.62	\$ 0.79	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 38.56
Communications Installer	\$ 25.18	\$ 2.52	\$ 0.76	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 37.43
Utility Technician	\$ 26.18	\$ 2.62	\$ 0.79	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 38.56
Utility Person	\$ 25.18	\$ 2.52	\$ 0.76	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 37.43
Storekeeper	\$ 27.13	\$ 2.71	\$ 0.81	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 39.64
Arborist	\$ 25.73	\$ 2.57	\$ 0.77	\$ 2.00	\$ 0.25	\$ 0.90	\$ 4.80	\$ 0.03	\$ 1.00	\$ 38.05

Schedule "C"
Wages and Benefits
As of May 1, 2014

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Health & Welfare	Training	Project Admin Fund	Pension	NETCO Fund	Retention & Promotion	Gross Hourly Rate
Journeyman Power Line Technician	\$ 33.54	\$ 3.35	\$ 1.01	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.13
Journeyman Electrician	\$ 37.07	\$ 3.71	\$ 1.11	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 52.12
Journeyman Civil	\$ 32.71	\$ 3.27	\$ 0.98	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.20
Journeyman Mechanical I	\$ 36.21	\$ 3.62	\$ 1.09	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 51.15
Journeyman Mechanical II	\$ 34.21	\$ 3.42	\$ 1.03	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.89
Heavy-Duty Mechanic Technician	\$ 34.21	\$ 3.42	\$ 1.03	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.89
Crane Operator	\$ 35.71	\$ 3.57	\$ 1.07	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.59
Heavy Equipment Operator	\$ 31.21	\$ 3.12	\$ 0.94	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.50
Light Equipment Operator	\$ 30.21	\$ 3.02	\$ 0.91	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 44.37
Blaster/Driller/Compressor Operator	\$ 31.21	\$ 3.12	\$ 0.94	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.50
Mechanic Helper	\$ 28.39	\$ 2.84	\$ 0.85	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 42.31
Accommodations Maintenance Person	\$ 28.39	\$ 2.84	\$ 0.85	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 42.31
Communications Installer	\$ 27.39	\$ 2.74	\$ 0.82	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 41.18
Utility Technician	\$ 28.39	\$ 2.84	\$ 0.85	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 42.31
Utility Person	\$ 27.39	\$ 2.74	\$ 0.82	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 41.18
Storekeeper	\$ 29.34	\$ 2.93	\$ 0.88	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 43.39
Arborist	\$ 27.94	\$ 2.79	\$ 0.84	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 41.80

Schedule "C"
Wages and Benefits
As of May 1, 2015

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Health & Welfare	Training	Project Admin Fund	Pension	NETCO Fund	Retention & Promotion	Gross Hourly Rate
Journeyman Power Line Technician	\$ 35.31	\$ 3.53	\$ 1.06	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.13
Journeyman Electrician	\$ 38.84	\$ 3.88	\$ 1.17	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 54.12
Journeyman Civil	\$ 34.48	\$ 3.45	\$ 1.03	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 49.20
Journeyman Mechanical I	\$ 37.98	\$ 3.80	\$ 1.14	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 53.15
Journeyman Mechanical II	\$ 35.98	\$ 3.60	\$ 1.08	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.89
Heavy-Duty Mechanic Technician	\$ 35.98	\$ 3.60	\$ 1.08	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.89
Crane Operator	\$ 37.48	\$ 3.75	\$ 1.12	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 52.59
Heavy Equipment Operator	\$ 32.98	\$ 3.30	\$ 0.99	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.50
Light Equipment Operator	\$ 31.98	\$ 3.20	\$ 0.96	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 46.37
Blaster/Driller/Compressor Operator	\$ 32.98	\$ 3.30	\$ 0.99	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.50
Mechanic Helper	\$ 30.16	\$ 3.02	\$ 0.90	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 44.31
Accommodations Maintenance Person	\$ 30.16	\$ 3.02	\$ 0.90	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 44.31
Communications Installer	\$ 29.16	\$ 2.92	\$ 0.87	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 43.18
Utility Technician	\$ 30.16	\$ 3.02	\$ 0.90	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 44.31
Utility Person	\$ 29.16	\$ 2.92	\$ 0.87	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 43.18
Storekeeper	\$ 31.11	\$ 3.11	\$ 0.93	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.39
Arborist	\$ 29.71	\$ 2.97	\$ 0.89	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 43.80

Schedule "C"
Wages and Benefits
As of May 1, 2016

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Health & Welfare	Training	Project Admin Fund	Pension	NETCO Fund	Retention & Promotion	Gross Hourly Rate
Journeyman Power Line Technician	\$ 37.52	\$ 3.75	\$ 1.13	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 52.63
Journeyman Electrician	\$ 41.05	\$ 4.11	\$ 1.23	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 56.62
Journeyman Civil	\$ 36.69	\$ 3.67	\$ 1.10	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 51.70
Journeyman Mechanical I	\$ 40.19	\$ 4.02	\$ 1.21	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 55.65
Journeyman Mechanical II	\$ 38.19	\$ 3.82	\$ 1.15	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 53.39
Heavy-Duty Mechanic Technician	\$ 38.19	\$ 3.82	\$ 1.15	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 53.39
Crane Operator	\$ 39.69	\$ 3.97	\$ 1.19	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 55.09
Heavy Equipment Operator	\$ 35.19	\$ 3.52	\$ 1.06	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.00
Light Equipment Operator	\$ 34.19	\$ 3.42	\$ 1.03	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.87
Blaster/Driller/Compressor Operator	\$ 35.19	\$ 3.52	\$ 1.06	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.00
Mechanic Helper	\$ 32.37	\$ 3.24	\$ 0.97	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 46.81
Accommodations Maintenance Person	\$ 32.37	\$ 3.24	\$ 0.97	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 46.81
Communications Installer	\$ 31.37	\$ 3.14	\$ 0.94	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.68
Utility Technician	\$ 32.37	\$ 3.24	\$ 0.97	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 46.81
Utility Person	\$ 31.37	\$ 3.14	\$ 0.94	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 45.68
Storekeeper	\$ 33.32	\$ 3.33	\$ 1.00	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.89
Arborist	\$ 31.92	\$ 3.19	\$ 0.96	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 46.30

Schedule "C"
Wages and Benefits
As of May 1, 2017

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Health & Welfare	Training	Project Admin Fund	Pension	NETCO Fund	Retention & Promotion	Gross Hourly Rate
Journeyman Power Line Technician	\$ 39.29	\$ 3.93	\$ 1.18	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 54.63
Journeyman Electrician	\$ 42.82	\$ 4.28	\$ 1.28	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 58.62
Journeyman Civil	\$ 38.46	\$ 3.85	\$ 1.15	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 53.70
Journeyman Mechanical I	\$ 41.96	\$ 4.20	\$ 1.26	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 57.65
Journeyman Mechanical II	\$ 39.96	\$ 4.00	\$ 1.20	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 55.39
Heavy-Duty Mechanic Technician	\$ 39.96	\$ 4.00	\$ 1.20	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 55.39
Crane Operator	\$ 41.46	\$ 4.15	\$ 1.24	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 57.09
Heavy Equipment Operator	\$ 36.96	\$ 3.70	\$ 1.11	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 52.00
Light Equipment Operator	\$ 35.96	\$ 3.60	\$ 1.08	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 50.87
Blaster/Driller/Compressor Operator	\$ 36.96	\$ 3.70	\$ 1.11	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 52.00
Mechanic Helper	\$ 34.14	\$ 3.41	\$ 1.02	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.81
Accommodations Maintenance Person	\$ 34.14	\$ 3.41	\$ 1.02	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.81
Communications Installer	\$ 33.14	\$ 3.31	\$ 0.99	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.68
Utility Technician	\$ 34.14	\$ 3.41	\$ 1.02	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.81
Utility Person	\$ 33.14	\$ 3.31	\$ 0.99	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 47.68
Storekeeper	\$ 35.09	\$ 3.51	\$ 1.05	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 49.89
Arborist	\$ 33.69	\$ 3.37	\$ 1.01	\$ 2.25	\$ 0.25	\$ 0.90	\$ 5.80	\$ 0.03	\$ 1.00	\$ 48.30

** If construction not complete by April 30, 2018, will negotiate new rate on or before that date and in the event the parties fail to reach an agreement, submit to arbitration*

Schedule "C"
Classifications and Rates of Pay

APPRENTICES	RATE
Apprentice 4 th Year	90% of JP Rate
Apprentice 3 rd Year	80% of JP Rate
Apprentice 2 nd Year	70% of JP Rate
Apprentice 1 st Year	60% of JP Rate

The working foreperson shall be paid a premium of two dollars (\$2.00) per hour worked, which premium will increase as follows:

May 1, 2014 - \$2.25
May 1, 2016 - \$2.50

The non-working foreperson shall be paid a premium of three dollars and twenty-five cents (\$3.25) per hour worked, which premium will increase as follows:

May 1, 2014 - \$3.50
May 1, 2016 - \$3.75

Note: The following outlines the funds specified in the above wage package.

1. Health and Welfare - two dollars (\$2.00) per hour worked, which shall increase to two dollars and twenty-five cents (\$2.25) per hour worked effective May 1, 2014 as per Article 26 and Letter of Understanding Re: Health and Welfare Fund Adjustment.
2. Training - twenty-five cents (\$0.25) per hour worked as per Article 26.
3. Pension – four dollar and eighty cents (\$4.80) per hour worked for the period May 1, 2013 to 2014 as per the Letter of Understanding Re: Health and Welfare Fund Adjustment, increasing to five dollars and eighty cents (\$5.80) per hour worked as per Article 26.
4. Retention and Promotion Fund – one dollar (\$1.00) per hour worked as per Article 26.
5. NETCO Fund - three cents (\$0.03) per hour worked as per Article 27.01.
6. Project Administration Fund - ninety cents (\$0.90) per hour worked as per Article 27.02

Schedule F – Accommodations, Clearing Operations, Designated Laydown area, Transportation, Medical Attendant Classification and any other classifications agreed to by the Parties

Gross Hourly Rate IBEW 1620 - May 1, 2013

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Add-Ons*	Gross Hourly Rate
Cook	\$ 30.50	\$ 3.05	\$ 0.92	\$ 8.98	\$ 43.45
Crane Operator	\$ 33.50	\$ 3.35	\$ 1.01	\$ 8.98	\$ 46.84
Heavy Equipment Mechanic	\$ 32.00	\$ 3.20	\$ 0.96	\$ 8.98	\$ 45.14
Feller-buncher, Mulcher, Harvester, Delimber / Processor	\$ 29.00	\$ 2.90	\$ 0.87	\$ 8.98	\$ 41.75
Fork-Lift, Muskeg, Skidder, Grapple Skidder, Forwarder, Truck Driver Tandem, Truck Driver Double Tandem, Bus Driver	\$ 28.00	\$ 2.80	\$ 0.84	\$ 8.98	\$ 40.62
Accommodations Maintenance Person	\$ 26.18	\$ 2.62	\$ 0.79	\$ 8.98	\$ 38.56
Labourer Clearing, Labourer Laydown, Accommodations Attendant, Server, Housekeeping	\$ 25.18	\$ 2.52	\$ 0.76	\$ 8.98	\$ 37.43
Storekeeper (Warehouse Person)	\$ 27.13	\$ 2.71	\$ 0.81	\$ 8.98	\$ 39.64

Gross Hourly IBEW 1620 - May 1, 2014

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Add-Ons*	Gross Hourly Rate
Cook	\$ 32.71	\$ 3.27	\$ 0.98	\$ 10.23	\$ 47.20
Crane Operator	\$ 35.71	\$ 3.57	\$ 1.07	\$ 10.23	\$ 50.59
Heavy Equipment Mechanic	\$ 34.21	\$ 3.42	\$ 1.03	\$ 10.23	\$ 48.89
Feller-buncher, Mulcher, Harvester, Delimber / Processor	\$ 31.21	\$ 3.12	\$ 0.94	\$ 10.23	\$ 45.50
Fork-Lift, Muskeg, Skidder, Grapple Skidder, Forwarder, Truck Driver Tandum, Truck Driver Double Tandum, Bus Driver	\$ 30.21	\$ 3.02	\$ 0.91	\$ 10.23	\$ 44.37
Accommodations Maintenance Person	\$ 28.39	\$ 2.84	\$ 0.85	\$ 10.23	\$ 42.31
Labourer Clearing, Labourer Laydown, Accommodations Attendant, Server, Housekeeping	\$ 27.39	\$ 2.74	\$ 0.82	\$ 10.23	\$ 41.18
Storekeeper (Warehouse Person)	\$ 29.34	\$ 2.93	\$ 0.88	\$ 10.23	\$ 43.39

Gross Hourly Rate IBEW 1620 - May 1, 2015

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Add-Ons*	Gross Hourly Rate
Cook	\$ 34.48	\$ 3.45	\$ 1.03	\$ 10.23	\$ 49.20
Crane Operator	\$ 37.48	\$ 3.75	\$ 1.12	\$ 10.23	\$ 52.59
Heavy Equipment Mechanic	\$ 35.98	\$ 3.60	\$ 1.08	\$ 10.23	\$ 50.89
Feller-buncher, Mulcher, Harvester, Delimber / Processor	\$ 32.98	\$ 3.30	\$ 0.99	\$ 10.23	\$ 47.50
Fork-Lift, Muskeg, Skidder, Grapple Skidder, Forwarder, Truck Driver Tandum, Truck Driver Double Tandum, Bus Driver	\$ 31.98	\$ 3.20	\$ 0.96	\$ 10.23	\$ 46.37
Accommodations Maintenance Person	\$ 30.16	\$ 3.02	\$ 0.90	\$ 10.23	\$ 44.31
Labourer Clearing, Labourer Laydown, Accommodations Attendant, Server, Housekeeping	\$ 29.16	\$ 2.92	\$ 0.87	\$ 10.23	\$ 43.18
Storekeeper (Warehouse Person)	\$ 31.11	\$ 3.11	\$ 0.93	\$ 10.23	\$ 45.39

Gross Hourly Rate IBEW 1620 - May 1, 2016

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Add-Ons*	Gross Hourly Rate
Cook	\$ 36.69	\$ 3.67	\$ 1.10	\$ 10.23	\$ 51.70
Crane Operator	\$ 39.69	\$ 3.97	\$ 1.19	\$ 10.23	\$ 55.09
Heavy Equipment Mechanic	\$ 38.19	\$ 3.82	\$ 1.15	\$ 10.23	\$ 53.39
Feller-buncher, Mulcher, Harvester, Delimber / Processor	\$ 35.19	\$ 3.52	\$ 1.06	\$ 10.23	\$ 50.00
Fork-Lift, Muskeg, Skidder, Grapple Skidder, Forwarder, Truck Driver Tandum, Truck Driver Double Tandum, Bus Driver	\$ 34.19	\$ 3.42	\$ 1.03	\$ 10.23	\$ 48.87
Accommodations Maintenance Person	\$ 32.37	\$ 3.24	\$ 0.97	\$ 10.23	\$ 46.81
Labourer Clearing, Labourer Laydown, Accommodations Attendant, Server, Housekeeping	\$ 31.37	\$ 3.14	\$ 0.94	\$ 10.23	\$ 45.68
Storekeeper (Warehouse Person)	\$ 33.32	\$ 3.33	\$ 1.00	\$ 10.23	\$ 47.89

Gross Hourly Rate IBEW 1620 - May 1, 2017

CLASSIFICATION	Base Rate	Vacation (10%)	Holiday (3%)	Add-Ons*	Gross Hourly Rate
Cook	\$ 38.46	\$ 3.85	\$ 1.15	\$ 10.23	\$ 53.70
Crane Operator	\$ 41.46	\$ 4.15	\$ 1.24	\$ 10.23	\$ 57.09
Heavy Equipment Mechanic	\$ 39.96	\$ 4.00	\$ 1.20	\$ 10.23	\$ 55.39
Feller-buncher, Mulcher, Harvester, Delimber / Processor	\$ 36.96	\$ 3.70	\$ 1.11	\$ 10.23	\$ 52.00
Fork-Lift, Muskeg, Skidder, Grapple Skidder, Forwarder, Truck Driver Tandum, Truck Driver Double Tandum, Bus Driver	\$ 35.96	\$ 3.60	\$ 1.08	\$ 10.23	\$ 50.87
Accommodations Maintenance Person	\$ 34.14	\$ 3.41	\$ 1.02	\$ 10.23	\$ 48.81
Labourer Clearing, Labourer Laydown, Accommodations Attendant, Server, Housekeeping	\$ 33.14	\$ 3.31	\$ 0.99	\$ 10.23	\$ 47.68
Storekeeper (Warehouse Person)	\$ 35.09	\$ 3.51	\$ 1.05	\$ 10.23	\$ 49.89



Code of Conduct and Business Ethics Handbook



Vision

Our vision is to build a strong economic future for successive generations of Newfoundlanders and Labradorians.

Values

At Nalcor Energy, our employees share a set of values that shape how we do business every day. Our core values set common direction on how to make decisions with a sense of pride and leadership. We recognize that it is not only what we achieve, but how we achieve it that truly makes us proud of our accomplishments.

Open Communication – Fostering an environment where information moves freely in a timely manner.

Accountability – Holding ourselves responsible for our actions and performance.

Safety – Relentless commitment to protecting ourselves, our colleagues and our community.

Honest and Trust – Being sincere in everything we say and do.

Teamwork – Sharing our ideas in an open and supportive manner to achieve excellence.

Respect and Dignity – Appreciating the individuality of others by our words and actions.

Leadership – Empowering individuals to help guide and inspire others.

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As President and CEO of Nalcor Energy, one of my most important duties is to ensure a work environment based on trust and respect, which enables employees to work without fear of intimidation, discrimination and retaliation. Enjoying our jobs is the first step. However, all of us should also have the comfort of knowing we work in a safe, secure and ethical workplace. Only then can we all feel proud to work here, feel good about our jobs, and work productively. Every person, regardless of position, shares in the responsibility for promoting a positive work environment.

To support this type of workplace, the Board of Directors adopted the *Code of Business Conduct and Ethics* (Code) for employees of all Nalcor Energy companies to reinforce the company's commitment to professional and ethical business practices. Nalcor Energy is growing and employees are increasingly dealing with more sensitive information. This Code provides general guidance and principles for the more complex business reality. The purpose of this policy is to provide guidelines on conflict of interest and ethical business practices and conduct and to promote expected standards of conduct. It also provides general guidance on how to avoid and report potential conflicts of interest and unethical business conduct.

This code links together many existing policies and legislation like our harassment policy, conflict of interest and Occupational Health and Safety legislation. It also addresses Nalcor's safety programs like the Internal Responsibility System. The content of the Code should be familiar to you. You'll also notice, the Code is supported by our values:

accountability, respect and dignity, safety, leadership, teamwork, open communications and honesty and trust.

Nalcor is committed to professional and ethical business practices. As you review the Code, if you have any questions or concerns, please take the opportunity to discuss these with your manager or feel free to contact me as well. Your cooperation is essential to ensure that we maintain a positive, productive workplace.

Regards,



Ed Martin

President and CEO





1. What the Code Means to Nalcor Employees

Our organizational goals are what define Nalcor Energy as a company dedicated to safety, the environment, business excellence, our people and our community. To ensure all Nalcor Energy companies meet our goals, we must practice the highest standards of business conduct and ethics.

This handbook should be used as a guide to practice responsible and ethical behaviour. The complete Code outlines Nalcor's commitment to professional and ethical business practices, and can be found in the policies and procedures section of the GRID. The Code defines the standards of conduct expected of our employees at all Nalcor Energy companies – including any contractors, suppliers, agents, officers or directors and anyone else who may represent the views or interests of our company.

Everyday, in everything we do, we must behave ethically, honestly and with credibility. When we apply this Code to the work we do, we become an organization that is a corporate leader not only in Newfoundland and Labrador, but around the world.

2. Purpose and Responsibilities

The Code identifies a standard for all our employees to follow when confronted with a situation that may cause us to question our ethics and principles at work. The Code defines what Nalcor considers conflicts of interest and potential conflicts of interest, as well as unethical business practices and conduct. Guidance is also provided through the Code to handle, and avoid, these situations all together.

When we follow the values and spirit of this Code, we ensure Nalcor is an organization with a reputation of integrity and sound business practices and conduct.

We all carry an individual responsibility to apply the principles of the Code to our work. The Code explains what accountabilities exist for Nalcor employees, Supervisors and Managers.

Employees

The first responsibility for Nalcor employees is to ensure we read and understand the Code. Following that, as employees, we must always conduct ourselves in a manner that reflects the principles of ethical behaviour, and avoid situations which may present a conflict of interest.

To protect the reputation of our company, employees have a responsibility to ensure everyone we work with complies with the standards and requirements of the Code. To respect our colleagues, customers, and Shareholder, we have a duty to immediately disclose any situation that may go against the principles or spirit of the Code.

Supervisors and Managers

Supervisors and Managers should always demonstrate the principles of the Code. Our Supervisors and Managers must be aware of any conduct that contradicts the Code and follow proper procedure to manage any issue. You also have a responsibility to provide guidance to employees about the Code, and address any concerns employees may raise about ethics and conduct in the workplace. Supervisors and Managers must also ensure that all Nalcor employees are provided with a copy of the Code and understand its requirements.



3. Key Principles

Four key principles guide how we should apply the Code in our day-to-day work. By understanding and following these principles, we can ensure respectable and consistent behaviour across the company.

- The commercial, reputational and other interests of Nalcor Energy must always take precedence over personal interests and those of third parties.
- We must always avoid any act or conduct – intentional or not – that may support the private interests of a third party or an individual over those of Nalcor Energy.
- Any conflict of interest – real or perceived – has the potential to impair the company’s credibility, reputation and commercial interests.
- We have an obligation to perform our duties and responsibilities in a conscientious manner, and never allow our personal interests to conflict with Nalcor’s.

All parties with whom we conduct business have the right to expect the highest standards of respect, professionalism and business ethics in their dealings with us.

We must demonstrate our commitment to business conduct and ethics in every interaction with our external stakeholders. Customers, suppliers, partners, competitors, shareholder representatives and regulators are among the external stakeholders with whom we regularly carry out business.

We are guided by our organizational values in the things we do and the decisions we make.

We must consider Nalcor's organizational values, standards and principles whenever we represent the company. Nalcor is committed to being an ethical and honest organization, this commitment should be considered in all Nalcor's strategies, plans and decisions.



4. Standards of Business Conduct

The Standards of Business Conduct is the corporate commitment to comply with applicable laws and established sound corporate business standards and practices. When our company fails to meet these standards, we risk damaging our reputation.

Compliance with Laws

In addition to following the Code and other corporate policy and procedures, all Nalcor Energy employees must comply with the applicable laws and regulations of the provinces and countries where we operate. Nalcor employees must never engage in, condone, or encourage any behaviour that is illegal or is not compliant with the Code. We all have an individual responsibility to understand the laws that apply to our work, recognize potential noncompliance and know when to ask for help to report on activity that is illegal or is contrary to the Code.



Safety and Health

Nalcor is committed to being a safety leader. This means ensuring we implement effective safety policies and procedures. To be a safety leader, we must also ensure organization-wide compliance with all applicable laws and standards to protect the health, safety and well being of our employees, contractors, customers and the public.

Employees must take all steps required to work safely. We all have a duty to support a working environment without injury and to foster a culture where everyone is committed to safety.

When working with each other or external parties, we must observe and actively promote Nalcor's core safety rules, which are central to our safety credo.

1. I always follow safety requirements and best practices.
2. I always take the time to complete my work safely.
3. I always take action when I see unsafe acts or conditions.



Environmental Protection

Being an environmental leader is an important goal for Nalcor Energy. Our *Environmental Policy and Guiding Principles* ensures the company sustains a diverse and healthy environment now and in the future. Nalcor's environmental principles maintain a high standard of environmental responsibility and performance. To ensure our environment is sustainable, we should all take time to understand our environmental policy and our commitment to meet and exceed environmental laws and regulations. Nalcor is working to prevent pollution and continually improve our own environmental performance. The goal of environmental protection cannot be achieved without the support and dedication of our employees and contractors.

If you observe someone endangering the environment, your legal and ethical responsibility is to report the situation to a Supervisor. When we take time to work in an environmentally-responsible manner and report environmental non-compliance, we ensure Nalcor builds its reputation as a company with sound environmental principles and actions.







5. Respecting Each Other

Each and every Nalcor employee contributes to the success of our company. We must respect one another and value each other for the different perspectives and experiences we all bring to the company. Mutual respect across divisions and lines of business will result in collaboration and new ideas to ensure Nalcor not only grows, but flourishes into the future and we achieve our vision.

Respect and Dignity

Nalcor employees deserve to work in an environment where they are treated fairly and with respect. We must all take steps to ensure we are respectful of others, supportive of the dignity and self-esteem of every person and promote an environment that is free of harassment. The importance of treating each other with respect applies to all Nalcor employees, regardless of their role or position.

Behaviours considered disrespectful and not supported by Nalcor include:

Harassment – Any behaviour directed at a person that is unwelcome and/or offensive will not be tolerated. Examples of behaviour that is considered harassment includes:

- threats
- unwelcome remarks
- derogatory comments or innuendo which may humiliate, insult or intimidate a person
- personal or sexual harassment
- abuse of authority
- any other conduct which denies a person their dignity and respect in any other way

Discrimination – We all deserve, and should expect, a workplace free of discrimination. Discrimination can be based on an individual's race, religion, religious creed, political opinion, color or ethic, national or social origin, sex, sexual orientation, marital or family status, physical or mental disability or age. The Newfoundland and Labrador Human Rights Code and the Canadian Charter of Rights and Freedoms provide basic protections against discrimination. We are all expected to apply those same standards in all our interactions as Nalcor employees.

Personal dignity and mutual respect – We are all responsible to encourage a work environment where a diversity of views, opinions and backgrounds is valued. The diversity of views and opinions of employees is a key factor in Nalcor's vitality and success. Any behaviour which denies individuals their dignity and respect is out-of-line with the Code, and the company's organizational values and principles, and will not be tolerated.

Offensive material – The posting or use of offensive, sexist, sexually explicit, racist or other discriminatory material in the work environment is never acceptable. At Nalcor, the work environment is considered the physical location where an employee performs their duties. Offensive material is prohibited on all Nalcor equipment and property, including its e-mail and intranet/internet systems and any other location that offends others.

“The importance of treating each other with respect applies to all Nalcor employees, regardless of their role or position.”



6. Protecting Our Business

Nalcor Energy's vision is to build a strong economic future for successive generations of Newfoundlanders and Labradorians. We are all responsible to contribute to the company's mandate to lead the development of the province's energy resources. To be successful, elements of Nalcor's business must be valued and protected. To protect the company and our stakeholders, we must ensure the effective management of our corporate assets, financial information and respect confidentiality and privacy requirements.

Protection of Corporate Assets

Nalcor Energy has an internal system of controls, policies and procedures designed to prevent fraud, misappropriation and other financial irregularities. To ensure the system is effective, we must all make an effort to protect Nalcor's assets against loss, damage, unauthorized use, theft and disposal. Assets may be tangible, including facilities, equipment, supplies, vehicles and property, or intangible, such as intellectual property, trade secrets and customer, business and confidential data and information.

Unless information has been produced specifically for external consumption, all Nalcor information – including records, data, project specifications and plans and processes, policies and procedures – are considered proprietary corporate information and must not be shared without proper authorization.

When circumstances arise where it is advisable or required for employees to share confidential information with external parties, we must work with management to ensure all parties must agree to, and sign, a Non-Disclosure Agreement. At any time that a contract or employment with Nalcor ends, any information or documents related to the company must also be returned.

Privacy and Confidentiality

Protecting the privacy and confidentiality of personal, business, employee, customer and contractor information is critical to maintaining Nalcor's credibility. We must all be diligent about protecting the privacy and confidentiality of our colleagues, our Shareholder, partners and customers. As a general rule, confidential information should never be released to external parties unless required by law or authorized by the affected party. To ensure we comply with privacy requirements, we should always appropriately secure any information considered confidential.

Nalcor employees who utilize the company's electronic databases or mail systems should familiarize themselves with the corporate policies and procedures regarding the storage, use and transmission of all confidential information.

Financial Information

Nalcor is dedicated to maintaining a reputation of being a financially accountable organization. All of the company's financial information, data and records are accurate, reliable, factual and complete, and are retained to meet the requirements of applicable laws and standards. Nalcor discloses its financial information in compliance with Canadian generally accepted accounting principles and all applicable laws. The company also makes full, accurate and plain disclosure in any report provided to regulatory authorities.

Security and Emergency Measures

The protection of life and property at Nalcor is committed through the development and implementation of corporate security and emergency measures, policies and processes. An example of security measures at Nalcor is the requirement for visitors to be made aware of facility safety policies and procedures.

Intellectual Property

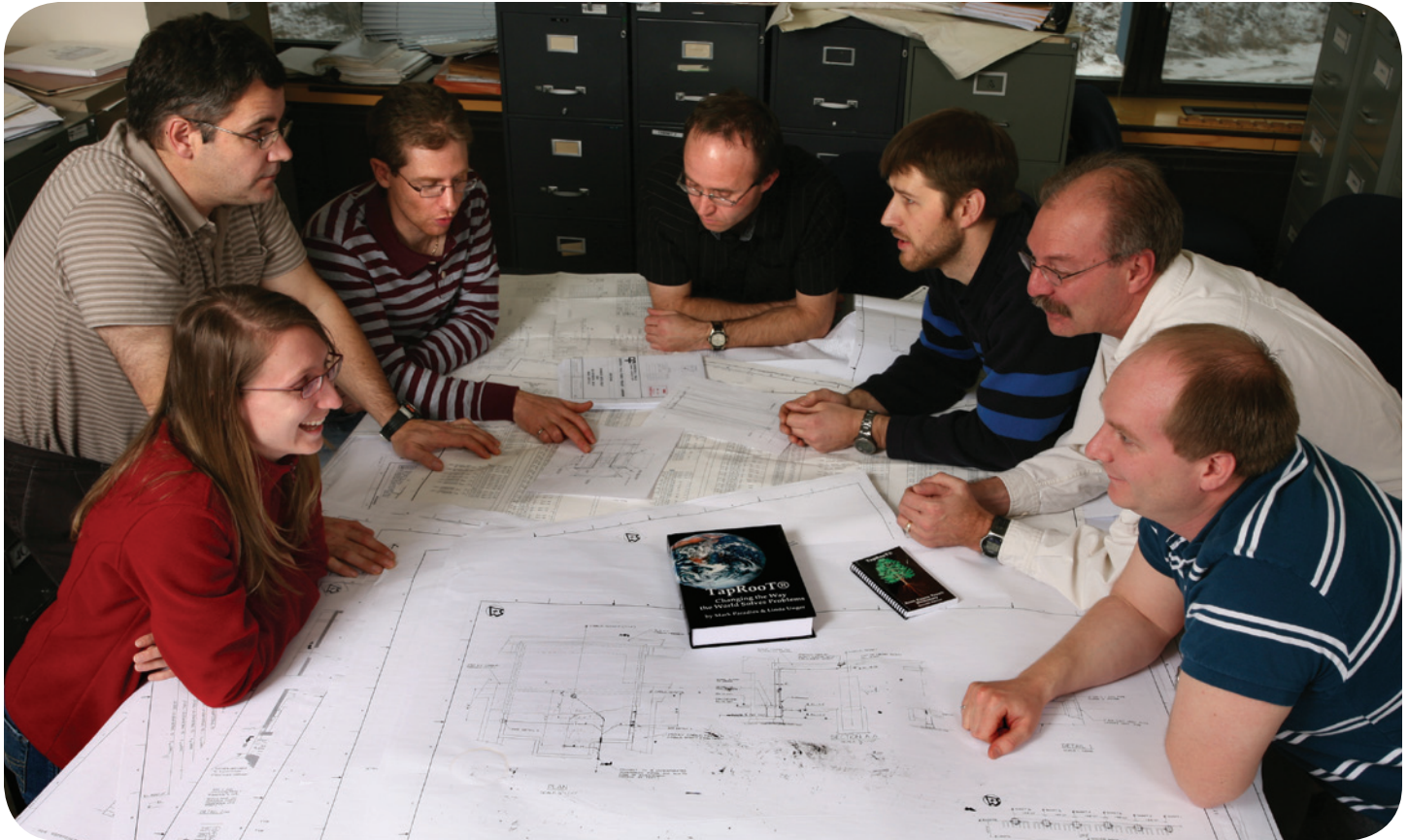
In the performance of their duties and responsibilities, Nalcor Energy representatives may develop an innovative product that is tangible or intangible – known as intellectual property. All employees must understand that any intellectual property created while an individual is employed by, or on contract with Nalcor, belongs to the company. Because intellectual property is owned by Nalcor, the company has the rights to the intellectual property, unless otherwise authorized.

Competitors

Nalcor Energy will never support any information gathering on a competitor that is illegal or unethical. Anytime a Nalcor employee gathers information about a competitor, it must be done in a manner that is both legal and ethical. Employees should never directly or indirectly solicit proprietary or confidential information about competitors. Information that may be considered proprietary or confidential must never be solicited from any colleague who may have once worked for, or who is currently employed by, a competitor.



“Nalcor Energy will never support any information gathering on a competitor that is illegal or unethical.”





7. Conflict of Interest

At all times, employees must avoid any conflict of interest – potential or real. Agents of the Province of Newfoundland and Labrador, including Nalcor and Newfoundland and Labrador Hydro, are governed by the Conflict of Interest Act (Act). Although not all Nalcor Energy lines of business are considered Crown corporations, this Code requires that all employees comply with the spirit and intent of the Act. The Act outlines responsibilities and behaviours we should always practice to avoid any potential conflict of interest. Any employee of an outside organization or contractor working with Nalcor must also follow the spirit and intent of the Act.

We should consider the implications of an activity that adversely affects, or could affect, our performance as a Nalcor employee to be a potential conflict of interest. Employees should refrain from any activity that could offer a personal advantage because of their employment at Nalcor.

Avoiding Conflict of Interest

To avoid any potential conflict of interest, we should exercise best personal judgment at all times. If there is any question if a situation could be a conflict, it is recommended to disclose the matter to a Supervisor or Manager. Guidelines are offered in the Code to help avoid conflict of interest.

Tips to avoid conflict of interest

- Do not participate in making a decision where there may be an opportunity to improperly benefit an individual or family member – directly or indirectly.
- We are not to use our positions to influence decisions that could result in a personal benefit for ourselves or family members.
- Confidential information that is not available to the general public cannot be used for personal gain, or the benefit of family members or anyone else.
- Other than compensation provided by Nalcor, we must never accept a fee, gift or personal benefit, unless a gift is given as a matter of business custom. Cash gifts are never acceptable.
- Employees must not let offers of future employment influence their duties or decisions as a Nalcor representative.
- Insider trading is the buying and selling of securities on the basis of insider knowledge – this means knowledge that is not available to the public. Any Nalcor employee who violates provincial or Canadian insider trading laws will be subject to both legal penalties and termination of employment.
- Price-fixing, bid-rigging, kickbacks or any other similar activity related to competitions are never acceptable. Any employee who engages in these sort of activities will be subject to immediate termination and any applicable legal recourse.
- Nalcor Employees cannot personally enter a contract with an outside company or vendor, except under the following circumstances:
 - the contract existed before the individual became a Nalcor employee
 - the contract was awarded by public tender
 - the contract was made in an emergency
 - the contract is for goods and services which cannot be provided by any other vendor
 - the individual is an employee of Churchill Falls (Labrador) Corporation Limited, and the circumstances of the contract fall under the provisions of Site Administration Regulation No. 5.6

Entertainment, Gifts and Favours

When we accept any sort of invitation, gift or other benefit, we must be mindful to avoid any situation that could be perceived as a conflict of interest. Gifts may only be accepted as a gesture of appreciation, hospitality or civility and be part of routine business relationships. Gifts and benefits should never be accepted if preferential treatment could be perceived.

Business meals and entertainment are acceptable when they are consistent with accepted business practices. They should only be accepted to further normal business relations, and should never be extravagant. All business meals or entertainment, received or provided, must be approved by a Supervisor or Manager.

“Employees are always expected to exercise good judgement in evaluating a donor’s reason or reasons for offering a gift.”

Gifts must never be accepted when the offering party is in a Request for Proposal or contractor selection process with Nalcor, or if the party has a relationship with a bid or another company making a bid.

Nominal Value

When accepting any gift, entertainment or other favour, the value of the gift must not exceed \$150 CDN. If a gift is offered above this value, the gift must be disclosed to a Supervisor or Manager.

A Supervisor or Manager may approve the acceptance of any such offer when circumstances justify it as an appropriate gesture of appreciation, hospitality or civility. When receiving an offer above the acceptable nominal value, alternatives such as donating the gift to a charitable organization or sharing the benefit with the department rather than an individual should be considered.

Employee Judgement

Employees are always expected to exercise good judgement in evaluating a donor’s reason or reasons for offering a gift. Prior to accepting a gift, we should always consider the effect a gift may have on our actions and how others may perceive the gift. If there are any questions or doubts about whether a gift, entertainment or other benefit should be accepted, the gift should be politely refused.

Outside Business Interests

Any outside business interest should never interfere with our employment at Nalcor. To ensure we always influence our best judgement as Nalcor employees, employees cannot be employed by an outside business during the employee's regular working hours for Nalcor. The company's real property, intellectual property, equipment or supplies must also never be used for outside business purposes.

To avoid any perception of conflict of interest, employees cannot promote or advertise outside business interests to co-workers during work hours. Employees should not be contacted at Nalcor offices by customers or partners outside of the employee's role at Nalcor.

Outside companies in which a Nalcor employee has an interest cannot enter into a contract with Nalcor unless the following provisions are met:

- a) the shareholding or interest of the employee is 10 per cent or less; or,
- b) Nalcor's Chief Executive Officer (CEO) agrees the employee is not in a position to influence the awarding of the contract, and that there is no conflict with the individual's public duties; or,

- c) the CEO decides the employee's shareholding or interest in the outside company will not interfere with the individual's duties and responsibilities as a Nalcor representative; or
- d) the CEO is satisfied that the employee's shareholding or interest has been placed in a trust which will prevent the individual from exercising authority or control over the affairs of the outside corporation or partnership.

Disclosure

Whenever we find ourselves in a situation we reasonably believe is, or could be, a potential conflict of interest, we must disclose the nature of the conflict to our Supervisor, Manager or Vice President. After a conflict has been disclosed, we must immediately remove ourselves from the situation.

8. References Related to the Code

- The **Code of Conduct and Business Ethics** provides additional information on Nalcor's standards of business conduct and ethics.
- For more information on Nalcor's **Safety and Health** policies, consult the *General Policy Statement – Health and Safety* and *Safety and Health Program* documents.
- Nalcor Energy's *Environmental Policy and Guiding Principles* provides additional direction about the company's **environmental protection guidelines**.
- Additional corporate policies provide requirements and guidelines about **respect and dignity** of others at Nalcor Energy.
 - Corporate policy EMR 14 *Respectful Workplace*
 - Corporate policy COR 16 *Internet Access*
 - Corporate policy COR 17 *Electronic Mail System Usage*
- The *Dishonest or Fraudulent Activities Policy* (Corporate standard EMR-18) provides additional requirements and guidelines about the protection of Nalcor assets.
- The corporate policy *EMR 8: Conflict of Interest* provides additional requirements and guidelines on **conflicts of interest** that apply to Nalcor employees.



EXHIBIT 12

SITE CONDITIONS

1.0 WORK LOCATION

The Site is located at Soldiers Pond, Newfoundland and Labrador. The coordinates of the Site is indicated on the Drawings provided in Exhibit 1 – Scope of Work.

1.1 Contractor to Keep Site Clear

During the execution of the Work, the Contractor shall keep the Site free from all unnecessary obstruction and shall store or dispose of any Contractor's equipment and surplus materials and clear away and remove from the Site any wreckage, rubbish or temporary works no longer required.

Unless otherwise provided elsewhere in the Agreement, the Contractor shall, throughout the Term of the Agreement, maintain its work area, laydown areas and passageways in order to permit the safe movement of pedestrians and vehicles at all times.

All maintenance and snow removal within the Contractor's work area, inclusive of Contractor's permanent access roads; temporary roads; Contractor laydown area and Contractor work areas, are the Contractor's responsibility.

1.2 Signage

The Contractor shall be responsible to install on its temporary roads all traffic signs to inform road users, ensure their safety, and facilitate traffic. Traffic signs shall be consistent with Applicable Laws and to the requirements of the Engineer.

1.3 Signs and Posters

Only standard safety bulletin boards and safety signs used to identify the LCP, Company, designated representatives and the Contractor, shall be allowed on the Site with prior Approval of the Engineer.

1.4 Clearance of Site on Completion

Upon Final Completion of the Work as Approved by the Engineer, the Contractor shall clear away and remove from that part of all Contractor's equipment, surplus material, rubbish and temporary works of every kind, and leave such part of the Site and Work clean and in a workmanlike condition to the satisfaction of the Engineer.

2.0 TEMPORARY CONSTRUCTION SERVICES

The Contractor shall operate and maintain temporary construction services (such as, but not limited to, dewatering, electrical power, etc.) on the basis of seven (7) days a week, 24 hours a day for the Term of this Agreement as required for the Work. At the end of

the Agreement, all the facilities of construction services shall be dismantled by the Contractor and remain its property, unless otherwise indicated. The Engineer has, at any time, the right to inspect the provisional facilities of the Contractor and require changes as he deems necessary, at the expense of the Contractor. The Contractor shall submit to the Engineer, for Acceptance, drawings and specifications of any construction services or installations that it intends to install in its working areas twenty (20) working days before the commencement of their installation, or as agreed upon with the Engineer.

2.1 Electrical Power Supply

The Contractor shall be responsible to provide its own power supply at Contractor's cost as necessary to execute its work and to provide power to its facilities, such as offices, workshops, etc. and Subcontractors' (if any) requirements.

2.2 Lighting

The Contractor shall be responsible to provide all lighting required for its work areas. The Contractor is responsible to ensure that adequate lighting exists (in accordance with existing lighting standards) in all work areas of the Site, whether during working or non working hours and shall be applied during night and during dawn and dusk, or any other time and place when and where insufficient daylight is available. The Contractor shall provide minimum lighting of 300 Lux and ensure sufficient lighting for the execution of the Work in satisfactory, efficient and secure conditions or as specified from time to time in the Technical Specifications. Access roads to the work areas shall have a minimum 200 Lux lighting level. All ducts and power lines for lighting and other electrical services shall be installed and maintained in a safe manner, fixed securely and placed as far as possible from transmission cables and cables used for blasting works (if any).

2.3 Potable Water

At all times for the Term of the Agreement the Contractor shall be responsible to provide its needs for potable water for all of the Work including the needs of its staff and Personnel. It shall provide all necessary equipment to distribute it to the different places at the Site. The Contractor shall be responsible to meet all standards as per the LCP Health and Safety Plan.

2.4 Industrial Water

The Contractor shall be responsible to provide its own supply of industrial water, either by pumping from rivers or streams or by wells. Industrial water shall meet the requirements of the Technical Specifications according to its purpose. The Contractor shall make the necessary arrangements to treat water to achieve these requirements.

2.5 Heating

The Contractor shall be responsible for the heating of its facilities and for any other heating required for the execution of the Work.

2.6 Dewatering and Sediment Control

The Contractor shall provide, install and maintain its own pumping and dewatering systems in the Work areas, if required. This includes the construction, operation and maintenance of sedimentation ponds. From the beginning of the work the Contractor shall take the necessary measures for the control and evacuation and sediment control of any water inflow or seepage of water in its Work areas, all in accordance with the Technical Specifications.

2.7 Sanitary Facilities

The Contractor shall provide and maintain all necessary sanitary facilities, either with a wash car or other means approved by Engineer. Contractor shall locate such facility (s) at the most convenient place(s) in Contractor's Work area and relocate them from time to time as the need arises. The Contractor shall provide all waste collection; all stipulated sanitary cleaning requirements and all associated consumables and water supply.

2.8 Cleaning of Lunch Rooms and Offices

The Contractor shall be responsible for all the cleaning of its offices, lunchrooms, workshops and all other workplaces under its responsibility on a regular basis. Lunchrooms shall be cleaned after each meal or break.

2.9 Waste Management

The Contractor shall be responsible for collecting all recoverable waste refuse and packing material the Contractor generates and for disposing it at the appropriate containers (clearly identified as to its restricted content) provided by the Contractor. If the Contractor fails to take the necessary measures to comply with and/or fulfill this obligation, the Company will notify the Contractor in writing to take immediate corrective action. If the Contractor does not comply after notification by the Company, the Company will have these task completed and back-charge the costs to the Contractor.

2.10 Site Security

The Contractor shall be responsible for maintaining all Site security during any and all working hours with consideration of the defined site security risks. It shall also be the Contractor's responsibility to provide for additional site security provisions (manpower, vehicles, equipment) to protect Contractors Personnel, property and equipment, if

necessary, during any downtime, for the duration of the Agreement, as required for the Work.

3.0 EMERGENCY RESPONSE

The Contractor's Health and Safety Plan shall include an on-site contingency and Emergency Response Plan to address safe operating procedures to be implemented during emergencies at the Site. The Contractor shall be responsible to arrange and make appropriate provisions (trained personnel, medical supplies/provisions) for medical treatment at the Site as required, in the case of injury or illness including adequate transportation (including having provisions for transporting and injured person on a stretcher) to the nearest doctor, medical clinic or hospital, if necessary.

4.0 FUEL AND FUEL MANAGEMENT

4.1 Fuel Supply

The Contractor shall be responsible to purchase all fuel it may require, at its own costs, and shall make the necessary arrangements thereto with suppliers. The Company assumes no liability and all costs associated with such fuel shall be all inclusive and deemed to be included in the Contract Price, except for those costs compensated in accordance with Exhibit 2 – Compensation, section 11.

During the execution of the Work, the Contractor shall be responsible for supply and management of its own fuel needs.

5.0 TELECOMMUNICATIONS

It is the Contractor's responsibility to make arrangements with the telecommunication provider for the services it needs. All installation and operating costs the Contractor incurs with the telecommunication provider shall be at the Contractor's account.

5.1 Land Mobile (VHF) Radio Clause

Contractors shall ensure all devices are licensed for use in Canada. Contractor is solely responsible for coordinating their company's radio frequency plan and obtaining applicable licenses from Industry Canada. Industry Canada reserves the right to shutdown all unauthorized devices. Company shall not be responsible for any unauthorized use or penalties invoked by Industry Canada.

6.0 WORK AREA AND LAYDOWN AREAS

6.1 Work Area

The Contractor shall be permitted to install its trailers, containers and other temporary buildings for its own use in close proximity to the Work area. The precise locations will be subject to the Engineer's approval.

7.0 MEDICALS AND ORIENTATION

Prior to access to the Site, Contractor Personnel shall be required and meet the following requirements in sequence:

- a) Successful completion of a fit for work medical assessment for a remote site.
- b) Undergo training from the project H&S team for Site Specific Orientation. Any additional special craft or skills training must be obtained by the Contractor.
- c) Submit a pre access drug and alcohol test.

8.0 PROHIBITION OF COMMERCIAL TRADE

Commercial activities are prohibited on the Sites.

9.0 RESPONSIBILITY OF THE CONTRACTOR

The Contractor is responsible for any and all replacement costs of items assigned to the Contractor's Personnel during their assignment at the Site. The Contractor is also responsible for repair or replacement resulting from damage caused by Contractor Personnel or its Subcontractor's to any property owned by the Company or the Company's Other Contractors.

10.0 TRANSPORT

10.1 Access to Sites

The Site is accessible as follows:

By Road

Soldiers Pond Site is approximately one and one half kilometres (1.5 km) from the Trans-Canada Highway and is located approximately thirty six kilometres (36 km) from St. John's, Newfoundland and Labrador.

By Air

Soldiers Pond Site is serviced by the St. John's International Airport. Air transport of passengers is provided by various commercial airlines such as:

- Air Canada
- Porter
- Westjet

- Etc.

Port Facilities

For Soldiers Pond Site, the Holyrood, St. John's and Bay Bulls port facilities are accessible by road to Site. Contractor is responsible for obtaining, from the appropriate Authority, the restrictions and requirements in using those facilities and associated services.

10.2 Transportation to the Site

The Contractor shall provide all necessary transportation of its Personnel, materials, equipment, tools, or other requirements associated with the Work between airports, seaports or cities, its accommodation facilities (wherever these may be) and Work locations at the Sites.

11.0 EXPLOSIVES AND BLASTING

Matters related to explosives and blasting operations are referred to in the Project-Wide Environmental Protection Plan (located in Exhibit 11 – Company Supplied Documents) and the Technical Specifications.

12.0 FACILITIES AND SERVICES FOR COMPANY AND ENGINEER PERSONNEL

The Contractor is responsible for providing suitable Site offices for exclusive use of Company and Engineer personnel at the Site complete with all required services, supplies, cleaning and maintenance as required by the Company and Engineer. These offices shall be fully serviced and fitted out, well lit and ventilated, heated and air-conditioned, and capable of being made secure with lockable door. In addition, the Contractor shall provide as part of its Site office, a suitable meeting room.

EXHIBIT 13

PROVINCIAL BENEFITS

1.0 Scope

For the purposes of this Agreement, wherever the terms “Bidder” and “Successful Bidder” appear in Attachment 1 – Completed Provincial Benefits Questionnaire to this Exhibit 13, each such term shall mean Contractor.

Company has agreed to a Lower Churchill Construction Projects Benefits Strategy (http://www.nr.gov.nl.ca/nr/energy/lcp_benefits_strategy.pdf) with the Province of Newfoundland and Labrador (the “Benefits Strategy”). This Benefits Strategy outlines all contracts, purchasing, and employment benefits objectives for the LCP. As well, Company has signed an Impacts and Benefits Agreement (“IBA”) with Innu Nation. Contractors are required to adhere to applicable obligations contained in this agreement.

Also the Government of Newfoundland and Labrador has entered into a Memorandum of Understanding (“MOU”) with the Government of Nova Scotia regarding industrial and employment benefits with respect to the Maritime Link transmission project. Details of this MOU can be found at: <http://www.releases.gov.nl.ca/releases/2011/nr/1128n06.htm>.

In this MOU the parties agree that the Company will meet the following commitments in regard to the construction of the Muskrat Falls Plant and the Labrador-Island Link:

1. Provide Nova Scotia contractors, service providers, consultants, and suppliers with open, timely and transparent access to procurement opportunities and activities in relation to the projects;
2. Provide reasonable advance notice to the Nova Scotia supply and service community of all procurement opportunities;
3. Conduct a supplier information workshop in Nova Scotia;
4. Communicate with unsuccessful Nova Scotia proponents, when requested, to help the proponents better prepare for future opportunities.

Contractor agrees to all of the following:

- To support, and cause all other members of the Contractor Group to support, the objectives and principles as committed to by Company as per the Benefits Strategy.
- To support, and cause all other members of the Contractor Group to support, the relevant objectives and principles contained in the IBA.
- To support, and cause all other members of the Contractor Group to support, the objectives and principles as committed to by Company as per the MOU.
- To make itself aware, and ensure that all other members of the Contractor Group are aware, of the terms of the Benefits Strategy, the IBA and the MOU that are relevant to the activities of Contractor relating to this Agreement.
- To comply, and cause all other members of the Contractor Group to comply, with the terms of the Benefits Strategy, the IBA and the MOU that are relevant to the activities of Contractor relating to this Agreement.
- To make best efforts to obtain Newfoundland and Labrador Benefits and Innu content as outlined in Attachment 1 – Completed Provincial Benefits Questionnaire as appended to

this Exhibit 13. If this content cannot be met, Contractor must inform Company as early as possible and provide Company with a rationale of why such content cannot be met and a mitigation strategy.

2.0 Contractor's Obligations

Contractor Shall:

- Execute commitments to the Benefits Strategy and IBA as outlined in Attachment 1 – Completed Provincial Benefits Questionnaire.
- Provide, and cause all other members of the Contractor Group to provide, contractors, service providers, consultants and suppliers within the Province of Newfoundland and Labrador (“NL”) with full and fair opportunity to participate on a competitive basis in the supply of goods and services as per Section 3.2 of the Benefits Strategy and Section 2.1 of Attachment 1 – Completed Provincial Benefits Questionnaire.
- Comply with the hiring protocols as outlined in the Benefits Strategy for work performed on the generation and transmission sites.
- Support LCP's gender equity and diversity initiatives and programs.
- Submit data reports on a monthly basis regarding employment and expenditures. Reporting tables to be supplied by Company.
- Make best efforts to fulfill commitments regarding NL bid content as stated in Attachment 1 – Completed Provincial Benefits Questionnaire.

3.0 Company Responsibilities

Company shall:

- Provide Contractor with data collection and system requirements relating to monthly Benefits Reporting.
- Provide website access to www.musktratfallsjobs.com. This system will allow suppliers and contractors to access applicants who have expressed interest in employment associated with the LCP.

ATTACHMENT 1

COMPLETED PROVINCIAL BENEFITS QUESTIONNAIRE



Nalcor Energy

Lower Churchill Project

Construction of Earthworks at Various Power Distribution Sites

Appendix A11

Provincial Benefits Questionnaire

Annex 1

Responses

Responses to Provincial Benefits Questionnaire

2.1a) Describe Bidder's experience with implementing local benefits strategies and agreements.

First of all, H.J. O'Connell Construction Ltd. would like to acknowledge that we have read, support and fully comply with the Benefits Strategy outlined for the Lower Churchill Construction Project.

With respect to previous relevant experience where Local Benefits Strategy/Agreement is an integral part of project success we would like to identify just a few projects in recent years. In particular:

1. Voisey Bay Development and Maintenance work
2. Relocation of Davis Inlet to Natuashish
3. Wuskwatim Hydro Development, Manitoba
4. Long Harbour Processing Plant

H.J. O'Connell Construction (O'Connell) has offices in St. John's and Wabush, Labrador. The Wabush office has supported the mining and heavy civil activities of the company in excess of 40 years. The majority of O'Connell employees are residents of Newfoundland and Labrador. We have and will continue to use local suppliers and subcontractors who are qualified to provide construction services. One hundred percent of O'Connell's operations are based in Newfoundland and Labrador. We know the people, the labor community, the aboriginal communities, the supplier community and we know how to do business to maximize opportunities for Newfoundland and in particular, for Labrador. We are a part of its history and are certainly committed to its future.

For a considerable period, particularly in recent years, we have worked extensively with First Nations in successful business relations. This experience includes business relationships with long standing partnerships with various aboriginal groups in different regions of the country, including the Innu and Inuit of Labrador and the Cree of Northern Manitoba, and more. All of our relationships have been built on trust and honesty, and as a result, they have been rewarded with success.

Recently O-N-E (O'Connell-Nelson-EBC, where O'Connell is the managing partner) has completed (completion Sept 2012) the Wuskwatim Hydro Facility in Northern Manitoba. Manitoba Hydro (the client) was mandated to provide full and fair opportunity on a competitive basis for subcontractors and suppliers from the aboriginal community, the local Northern Region, then the rest of Manitoba, then Canada, then outside Canada. We selected the successful subcontractors and suppliers (we looked for minimum of at least 3 quotations for all services) based on competitiveness, ability to provide adequate resources to complete the work on time and on budget, ability to meet contract specifications, local nature of the business and aboriginal involvement. We have chosen subcontractors and suppliers under this approach where success was not always determined by the face cost of the commodity. The selection was based on best value for the project.

For the development of all Voisey Bay Infrastructure work from 2002 to 2005 the client (INCO at that time, but now VALE) had a local benefits strategy to maximize provincial benefits. Most importantly they had signed an impact and benefits agreement with both Labrador aboriginal groups, the LIA (Labrador Inuit Association, now Nunatsiavut) and the Innu Nation. O'Connell was the managing partner with LIDC (Labrador Inuit Development Corporation) while Kiewit had, and continues to have, a partnership with the Innu (IKC). In an effort to satisfy the requirements of the IBA's negotiated for this project the client encouraged both groups to form one consortium to pursue the work at the Voisey Bay site. With that in mind IKC – Borealis (IKCB) was formed (Kiewit as managing partner) and the consortium secured all Civil Infrastructure for the project development. Our organization looked to aboriginal business first for services to the project, then to the remainder of Labrador, then to the general supply services community in the province. All services provided were selected on the basis of the solid business principle of best value for the project where competitiveness and ability to perform on time and on budget were fundamental. In all cases all suppliers and subcontractors provided response to RFP's for defined work scope. We required a minimum of 3 individual proposals for all supply services to ensure best value for the client. We performed a net value of work in the order of \$250 million over a 3 year period. We were successful in securing aboriginal and other local suppliers for the vast majority of the services required. For example, we used local aboriginal companies for many items, including air services, equipment rentals, clearing, building materials, office supplies, piping and metal fabrication, etc. We used local Newfoundland companies for supply of rebar, explosives, equipment supply, parts and consumables for equipment, fuel, small tools, safety supplies, construction materials (permanent and consumables), etc.

In 1999 O'Connell partnered with the Innu Community of Natuashish (formerly known as Davis Inlet) and formed a partnership called Natuashish Construction. This partnership was 51% owned by the Davis Inlet Band Council and 49% by O'Connell, while management control remained with O'Connell. Under this arrangement, contracts were issued over a 3 year period to construct a dock, access roads, an airstrip and terminal, water supply and distribution, etc.

In addition to the band council's equity position in the business, which included profit sharing, O'Connell provided employment and training opportunities to members of the aboriginal community. The partnership completed all contracts in a manner that provided best value for the client with significant benefits going back to the Davis Inlet Community.

O'Connell has continued with its partnership with the Inuit after completion of the Voisey Bay Infrastructure works in 2005. Since that time O'Connell (49%) and Labrador Inuit Strategy Trust (LICST)(51%), the entity responsible for all operations of the Nunatsiavut group of companies have an ongoing partnership operated as Nillik Construction. This company has performed maintenance work in Voisey Bay after the completion of the infrastructure work. This company was formed to pursue civil works at Voisey Bay and other civil major works in Labrador where the Inuit have benefit agreements or on other projects outside of the land claim areas depending on the viability of the business opportunity.



2.1b) Describe Bidder's procurement policies and procedures that will ensure reasonable advance notice to Newfoundland and Labrador (NL) supply community of all procurement opportunities.

O'Connell will be providing every opportunity to the Newfoundland and Labrador supply community to provide all goods and services in a manner that meets or exceeds the requirements of the Lower Churchill Construction Project Benefits Strategy. O'Connell has a 42 year history of working with the supply community in Newfoundland and Labrador for all support services to its Mining and Heavy Civil operations. This history includes playing a significant role in the development of the mining industry in Labrador West, Upper Churchill Hydro Development, Trans-Labrador Highway, Sango Bay Development (relocation of Innu from Davis Inlet), Voisey Bay Development, infrastructure work in coastal communities, Long Harbour Processing Plant Site Development, etc. This history covers a span of 42 years working in Labrador. O'Connell started in Labrador in 1970 and has grown with Labrador since that time.

To ensure qualified suppliers are engaged in procurement activities, we will be reaching out to the business community in a number of ways:

1. We will draw on our past working relationships to identify qualified and competent suppliers who are a registered Aboriginal business.
2. All supply opportunities will be advertised in local print media to ensure all local suppliers are provided fair and open access to the work. In addition we will advertise in known regional print media to ensure full geographic coverage of the benefit area.
3. We will be contacting directly all known qualified suppliers who we have in our current database.
4. O'Connell is an active member of both the Newfoundland and Labrador Construction Association (NLCA) and the Newfoundland and Labrador Road Builders/Heavy Civil Association. Supply opportunities and procurement details will be advertised in weekly bulletins published by both organizations.

For all subcontracting and supplier opportunities we will seek out a minimum of 3 proposals to ensure we receive competitive pricing to attain best value for the client and the project. The evaluation criteria must consider competitive pricing, ability to satisfy project timelines, and ability to satisfy all contract specifications to meet the quality standards demanded by the client. We can and will provide a complete summary of activity by region detailing all procurement opportunities, listing suppliers expressing interest in the opportunities and identify the successful business for each opportunity.

2.1c) Describe Bidder's familiarity with NL contractor/supply capabilities. If Bidder is not currently familiar with these capabilities, describe proposed steps to ensure familiarity.

H.J. O'Connell has successfully operated as a 100% Newfoundland and Labrador business since 1970. In the past 10 years of operation in this province O'Connell has used the services of approximately 900



suppliers and subcontractors who are actively engaged in the local construction community. Management members have and continue to be active in the industry associations such as Heavy Civil/Roadbuilder's Association, Newfoundland and Labrador Construction Association, Newfoundland and Labrador Employer's Association, etc. In keeping with our Quality Management System all suppliers and subcontractors are evaluated in terms of their ability to deliver specified products to the quality standards demanded by the Client, their ability to deliver to meet project timelines and their ability to deliver a product that brings best value to the project (refer to Appendix A7 - Quality Management Questionnaire for additional information). Our management people are all Newfoundlanders and Labradorians who have spent their lives working in the heavy civil business in this province. It is a small construction community in this province and we have successfully grown a company here for more than 40 years. From this fact one can conclude that we know the contractor/supply community better than most. We are also well known to the local contractor/supply community and have an excellent reputation in this province. Ours is a reputation for being fair, honest and operate with the highest level of integrity.

All engineering, project management, administration, payroll, accounts payable and receivable for all operations are handled through our St. John's permanent office. All equipment management, procurement, maintenance controls, etc. is managed through our Wabush office. Our equipment fleet, all managed from our Labrador operations, now consists of in excess of 350 pieces of heavy equipment.

2.2a) Describe Bidder's familiarity with the Newfoundland and Labrador Workforce

As indicated previously, the fact that we have operated in this province for 42 years has caused us to become very familiar with the Newfoundland workforce. We have been "moving dirt and pouring concrete" for a long time in Newfoundland and Labrador and we would venture to guess that most active members in the construction workforce (Heavy Civil and Mining) have worked with us at one point or another (some on a regular basis) during this time.

We are a union company wall to wall. Under our Heavy Civil operations we have union agreements with the Operating Engineers (Local 904) for all equipment including off-highway trucks and the Carpenters (Union Local 579) for carpenters and all other labor not covered under the Operating Engineers jurisdiction. This has worked well for us and these affiliations have allowed us to access all active members in these unions. In fact, these affiliations allowed O'Connell, managing partner of O-N-E at the Wuskwatim Hydro project, to source qualified labor in Newfoundland and Labrador for that project.

We have completed in excess of \$350 million of heavy civil construction at Long Harbour, NL, where we employ a workforce of in excess of 500, all of whom are permanent residents of Newfoundland and Labrador. Under this project we are working with the Resource Development Council where all 16 Building Trade Unions are represented.



O'Connell and Kiewit partnered for the construction of all infrastructure for the Voisey Bay project where, as a partnership, we employed in excess of 600 persons. On that project over 20% of our workforce were members of Inuit and Innu communities along the coast of Labrador.

O'Connell employs on a regular basis in excess of 200 persons to support its Mining and Heavy Civil Operations in Labrador West for long term clients such as IOCC and Wabush Mines.

Senior Management members of H.J. O'Connell, including Leonard Knox and Willie Keats, have participated in the vast majority of all major projects in the Province. We know the local workforce to the extent that we can call most by their first name. They know us even better.

2.2b) Describe Bidder's human resource policies that will optimize NL employment benefits.

We understand that this project has a SPO (Special Project Order) where specific terms and conditions for employment through the union halls will be clearly identified. O'Connell will fully support and cooperate with the requirements of the SPO to maximize the employment of all qualified local labor. Our Human Resource group will connect with and have open communication with the Innu Nation and other aboriginal groups. In addition, job opportunities will be posted/advertised in local papers to ensure qualified local residents receive preferential opportunities. During the Voisey Bay development we formed a liaison group consisting of representatives of both Labrador aboriginal groups and our Human Resource management group to allow easier identification of qualified First Nation members. For the Wuskwatim Hydro Development we worked directly with representatives of the employment and training group of Nisichawayashik Cree Nation (NCN) at Nelson house to identify members for employment at the project. For this project we also worked with the Client to develop training modules to allow integration of members who had accredited academic training but little job experience.

From the information provided in this questionnaire, it should be concluded we are fully engaged with the Newfoundland and Labrador workforce at the present time on other major projects where we optimize local benefits. We have successfully completed major projects in the recent past where the same was true. We have a track record of working successfully in the province utilizing the Newfoundland and Labrador workforce.

2.3a) Does Bidder have a gender equity and diversity plans? If so, describe Bidder's policies, including harassment and discrimination policies that support gender equity and diversity.

We have equitable employment policies and promote gender equity and diversity. We are confident that our programs will meet or exceed the Client's commitment to gender equity and diversity.

H.J. O'Connell has long recognized that women, while currently under-represented, can play a more significant role in both the Construction and Natural Resources Industries. There are numerous systemic barriers that hinder women from participating in these industries. The objective of this Women's



Employment Plan is to address those barriers by implementing affirmative action policies and educating our workforce and the public on the reasons why such barriers should not exist.

Recognizing the real challenges that lay ahead for both the natural resource and the construction industry, we have taken a highly proactive approach to preparing ourselves for business in the 21st century by placing an acute emphasis on equitable employment practices, employee training, quality assurance, health, safety and environmental sustainability.

Appreciating the challenges faced by modern owners competing in global markets, we are committed to working as partners with Clients to develop effective solutions and meet those challenges head on. By adopting our Client's goals as our own and with a commitment to team spirit through effective two-way communications, we can adapt efficiently to the Client's needs without compromising budgets, schedules, safety or quality.

O'Connell has a proud and proven history of incorporating women into their workforce to fill untraditional roles in both the construction and mining industries in Labrador. To alleviate the shortage of trained operators, O'Connell has recruited from two under-represented groups in the construction industry, women and aboriginals. In order to fill the void left by retiring operators or others who chose to move on to the larger mining companies, we have looked to women and aboriginal workers as a solution to the problem of skilled trade shortages.

We know that our employees do their best work when they feel valued and respected by the company and their colleagues. That is why we are committed to ensuring our employees thrive in a work environment that is:

- Fair;
- Equitable;
- Accessible; and
- Free from harassment

We strive to create a work environment in which differences are respected so all employees can make a full and rewarding contribution to the company's corporate goals. The company has developed policies aimed at supporting a respectful workplace to enable:

- Individual and team productivity;
- Employee wellness;
- Employment engagement; and
- Alignment with corporate values

Our policies create the foundation for a respectful workplace, but they are just the beginning. Other initiatives that support a respectful workplace and promote employment for woman include the



promotion and education of diversity in the workplace and setting realistic hiring targets to ensure women are provided the opportunity to work in untraditional roles.

We promote diversity in the workplace during our initial induction and annual orientation of employees. During the year, issues dealing with workplace diversity are common topics for weekly tool box meetings. As part of our workplace communication, posters promoting Workplace Diversity are routinely placed particularly in recognition of significant events such as Women's Day. We are prepared to develop a Gender Sensitivity Training Session for our employees or attend any training as per the Client's requirements.

All members of senior management are trained to identify harassing behavior in the workplace and how to deal with it promptly and decisively. Human Resources and Health and Safety personnel are trained to provide support and ensure that all issues are addressed and resolved.

All of our policies pertaining to a respectful workplace are reviewed with every employee during their initial induction and subsequent annual orientation. The policies are discussed in detail and the subject of diversity in the workplace is promoted in a positive and respectful manner.

O'Connell is committed to ensuring that workplace diversity and employment equity are promoted and practiced by their subcontractors and suppliers. In lieu of their own Women's Employment Plan, our suppliers and subcontractors will be expected to comply with ours and the Client's.

We have executed numerous contracts with the participation of aboriginal groups and communities. We are keenly aware of, and sensitive to, the cultural differences of the First Nations communities and ongoing social issues in many of those communities. We believe in cultural awareness and education for all involved during project construction. Continual cultural awareness sessions during the entire construction phase are crucial. We encourage a partnership approach with the First Nation community to ensure that the Contractor, the Client and his Representative (SNC-Lavalin) and the First Nation community establish a process for open dialogue and effective communication. We would seek the establishment of a liaison group including the First Nation representatives to ensure that our actions and the reasons for our actions are effectively communicated to the community in a timely manner. With the Contractor, Client, Labor and First Nation working collectively to achieve the end result of creating a process to maximize aboriginal participation, success will be assured.

We have included under this section (refer to Annex 2) the following articles and policies.

1. "Untraditional Operators" Published August 2, 2007 – The Aurora
2. "Paving the Way" Published August 27, 2007 – The Aurora
3. Harassment Policy
4. Respectful Workplace Policy
5. Code of Ethics Policy
6. Workplace Violence Policy
7. Equitable Employment Policy



2.3b) Does Bidder's human resource policies enable the voluntary identification of members of under represented groups?

Although we do not formally offer candidates the opportunity to voluntarily identify whether they are, or not, from a designated group, our selection process is non-discriminatory and provides equal opportunity for all applicants, regardless of their protective status under the charter of Human rights. Further agreements with the Unions representing our employees provide priority in hiring for open positions to qualified First Nation Employees over non-native applicants.

2.4a) Indicate Bidder's previous experience at capturing employment and expenditure data as they relate to local benefits monitoring.

H.J. O'Connell Construction Ltd has over the last 12 years completed several large projects requiring the reporting of employment and or expenditure statistical data. These projects include:

- Voisey Bay Mine Site Development (2002 – 2004) for Voisey Bay Nickel
- Wuskwatim Hydro Development for Manitoba Hydro
- Long Harbour Processing Plant Site Development for VALE

Typically the reporting requirements were defined with the Client and the presentation format for reporting formalized on the project site with the Client's site management staff. The report timeframe is typically monthly and usually carried out in conjunction with the monthly progress report process. Reporting requirements can be reported online as is the case for the IBMS (Industrial Benefits Monitoring System) requirements for VALE at the Long Harbour Site. Here, in addition to the hard copy weekly and monthly report submittals, employment and expenditure data is submitted online.

Typical information in the reports may include:

- Total Employees (craft and/or staff)
- Number of employees in predefined categories (number and percentage base)
- % actual of employees by categories versus target % if defined
- Wage expenditures total and by categories
- Supplier/Vendor expenditure totals by class/region
- Subcontractor expenditures and manpower (note that the subcontractor information is obtained from the subcontractor at the required periods and is incorporated into the commercial terms of the subcontract agreement to ensure compliance with the project reporting requirements).

A typical list of tracking categories may include:

- Local Community Aboriginal
- Local Regional Aboriginal



- Provincial Aboriginal
- Provincial Other
- Atlantic
- Canadian
- Other

There can be as many unique identifiers for categories as required.

In 2008, O'Connell commissioned a customized upgrade to their accounting system that permits the unique identifiers to be assigned to employees upon hire-on and to suppliers, vendors, subcontractors, etc. Currently, we have the capability to automatically generate a variety of reports that detail/summarize employment and expenditure data by project for any selected time period. This information can be customized as required to meet the needs of our Clients.

2.4b) Identify who, within Bidders organization, will be responsible for benefits monitoring and reporting.

Willie Keats (resume included in Annex 3) will be responsible for benefits monitoring and reporting. Willie brings a wealth of experience, vast local knowledge of the construction community, many years of working in partnership with aboriginal communities on projects such as Voisey Bay, Davis Inlet relocation to Natuashish and the Wuskwatim Hydro project. Willie has an extensive back ground in operations, constructions, project management and contracts management. He is well respected and has close relationships with the supplier community where the principals of honesty, fairness and integrity are valued.

We will have a Human Resources management team who will also work with the aboriginal community and the general employment community to source competent and qualified individuals in priority order (as specified by and in keeping with the Lower Churchill Construction Project Benefits Strategy and IBA Commitments).

All documentation will be tabulated and provided on a regular basis identifying all information as required by the Client's commitments under the Benefits Strategy.

Leonard Knox, Vice President - Major Projects for O'Connell, will be the sponsor for this project. He was responsible for negotiating all work in Voisey Bay for Borealis (under the IKCB partnership) and worked with both aboriginal groups to maximize benefits for First Nations at Voisey Bay. He has an excellent working relationship with the leadership in both local aboriginal groups.

He has worked on major projects in NL, over the past 30 years and is very knowledgeable and familiar with the local supply chain and its ability to deliver the right product at the right time for best value. Some of the projects on his resume include Hinds Lake Hydro Development, Upper Salmon Hydro



Development, Cat Arm Hydro Development, Hibernia Offshore Project, IOCC Expansion, Voisey Bay Development, Davis Inlet Relocation, Long Harbour Development, etc.

3.0a) Is the Bidder registered as an Innu Company with the Innu Business Development Corporation (IBDC)?

O'Connell has had a successful history working with the Innu group and its current leadership. Our business relationship at Voisey Bay and Natuashish was a success for all concerned and we are committed to a similar result at Lower Churchill. We have a history of working co-operatively together.

3.0b) List any intended subcontractor's/suppliers that are currently IBDC registered Innu Companies.

It is our intention to self perform the vast majority of the work but may subcontract small/specialized components of the work. At the time of tender we had not received firm proposals from qualified registered Innu Companies for this work. If we are awarded the work we will provide full opportunity to interested IBDC registered companies to provide proposals for this work and the selection process would be based on best value for the project in terms of aboriginal and local content, ability to deliver according to project schedules, ability to provide a finished product meeting all contract specifications, and cost competitiveness.

At the time of tender we are unable to identify suppliers who are in fact currently IBDC registered companies. If awarded the work, supply opportunities will be made available to such companies on the basis of satisfying best value for the project satisfying commitments made under the IBA for the project.

3.0c) Identify who, within Bidders organization, will be responsible for benefits monitoring and reporting and communication of procurement opportunities to the IBDC.

Refer to response to question 2.4b).

3.0d) Identify the number, if any, of personnel submitted with this bid who are members of the INNU nation.

It is difficult at the proposal stage to identify individual personnel, being members of the Innu Nation, who will be employed on the project. If we are successful this will be defined during the detailed project planning. We are committed to maximizing opportunities for qualified Innu members and will work with the client to maximize training opportunities.

3.0e) Provide information relating to commitments to Innu content, including employment of Innu, Subcontracts to Innu businesses, training opportunities for Innu, and other benefits for Innu, Innu businesses or Innu communities.

Under other sections of this questionnaire we have highlighted our past experience in working with aboriginal communities on major projects where IBA's have been negotiated, in particular, our



experience in Labrador. We again make reference to the experience of O'Connell who formed a long lasting relationship with both First Nation groups in Labrador.

Prior to the development of Voisey Bay in 1997, O'Connell formed a partnership agreement with the Labrador Inuit Development Corporation (LIDC), a partnership that still exists today. This partnership played a major role in the development of all infrastructure (approximate value of \$250 million) for the Voisey's Bay mine site in Labrador from 2003 to 2005. For the Voisey Bay development our group (Borealis) partnered with PKS and the Innu Nation forming a JV known as IKCB (IKC-Borealis). This partnership which included both First Nations was encouraged and supported by the Client whereby all infrastructure work was negotiated. In addition to the partnership relationship at Voisey Bay, IKCB also gave preference to qualified and competitive aboriginal suppliers and subcontractors. Again IKCB subcontracted such work as clearing, bussing, supply of local construction materials (depending on availability from the local communities), equipment rentals, etc.

Training and employment opportunities for aboriginal members were fundamental pillars of our partnership. In fact, since training funds were not readily available in the early stages of the work (even though there was a Client commitment for having an aboriginal workforce of at least 25%), IKCB provided some of its own monies to ensure project commitments were satisfied. We formed a liaison committee comprised of both aboriginal groups (Innu and Inuit) and the construction partners who worked with the aboriginal communities to identify suitable candidates for training opportunities at the site. These opportunities included heavy equipment operation, maintenance of construction equipment (mechanic and welder apprenticeship), formwork construction (carpenters and laborers), pipe laying and fusing (pipefitters and laborers), rebar installation (ironworkers), etc. Overall we feel we were very successful in our training efforts at Voisey Bay since we attained or surpassed project goals. All parties in the JV, including our aboriginal partners, were very happy and proud of the success attained on this project. They feel the same to this day. At peak on this project our Joint Venture employed a workforce of some 700 persons at Voisey Bay.

H.J. O'Connell has maintained business partnerships with both aboriginal groups whereby the state (or the nation) is the business partner versus an individual. In this way the maximum benefit goes back to the community for all to benefit.

Since completion of the infrastructure work, O'Connell and the LIDC have continued their partnership relationship to perform maintenance contracts at the operating mine site. O'Connell/LIDC partnership, or Nillik Construction, continues to pursue and perform contract work under the partnership arrangement.

The partnership with both companies and aboriginal partners has and continues to be very successful for all parties. The business entity has been competitive in the market place and has provided profits back to the community in addition to business, employment, and training opportunities.

Just recently O-N-E completed the 205 MW Wuskwatim Generating Station in Northern Manitoba. This project, located about 90 km northwest of Thompson, Manitoba, is a partnership between

H.J. O'Connell Construction Ltd. | Provincial Benefits Questionnaire



Nisichawayasihk (NCN) First Nation and Manitoba Hydro. The project began in November 2008 and our scope was completed in October 2011, some 8 months ahead of the original schedule.

Over the course of the project we provided subcontracting and service contracts to qualified and competitive First Nation businesses. For example, all clearing, offsite trucking (such as hauling of concrete sand), significant equipment rentals, etc. have all been contracted to local First Nation companies. All lumber for formwork construction and miscellaneous building materials were provided by First Nation suppliers. Overall, we provided First Nation businesses with significant commercial activity over the construction period. We are quite proud of this achievement.

The above are just a couple of examples of our close working relationship with Aboriginal/First Nation communities in recent years. Considering our history of working with aboriginal communities, we can show successful business relations over the long term.

H.J. O’Connell is committed to providing business opportunities to local aboriginal communities. Based on our experience in working with aboriginal communities and being mindful of capacity limitations we will maximize subcontracting opportunities without losing sight of schedule, cost and the overall value for the success of the project. It is important to note that our experience and history of working with the aboriginal community has resulted in competitive pricing, meeting or exceeding project schedule milestones, and delivery of a quality product.

4.0 a) Employment Estimate by Residency

Employment Category	NL	Other Canada	Foreign	Total
Management	100%			
Engineering	100%			
Procurement and Contracting	100%			
Construction and Assembly	100%			
Other	100%			
Total				

4.0 b) Employment Estimate by Location of Work

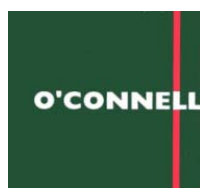
Employment Category	Labrador	Island of Newfoundland and	Other Canada	Foreign	Total
Management		100%			
Engineering		100%			
Procurement and Contracting	50%	50%			
Construction and Assembly	40%	60%			
Other					
Total					



5.0 a) Expenditure Estimate Table

	NL	Other Canadian	Foreign	Total
Materials and Equipment	100%			
Direct Labour	100%			
Services	100%			
Overhead and Profit	100%			
Other	100%			
Total				100%





Nalcor Energy

Lower Churchill Project

Construction of Earthworks at Various Power Distribution Sites

Appendix A11

Provincial Benefits Questionnaire

Annex 2

Articles & Policies

Published August 2, 2007 –The Aurora

Untraditional operators

O'Connell's wants heavy equipment program in Lab. West



Gary Peckham photo/H.J. O'Connell Construction has opened its doors to untraditional heavy equipment operators this summer. The company wants government to offer a heavy equipment program in Labrador West to help address the labour shortage.

BY GARY PECKHAM
Special to The Aurora

Heavy equipment operators are in high demand.

For decades, industry experts knew it would become a booming profession and according to Len Knox, area manager of H.J. O'Connell Construction Limited, it has been one for the past several years.

"We and other construction and mining operating companies have seen it, governments and training institutions and unions have done studies, which prove it and yet no one is stepping forward fast enough to fill the void," Mr. Knox said. "We don't feel we can wait any longer and have hired our own instructor, while at the same time have started hiring what some may consider non-traditional operators to fill our employment shortage."

People in Labrador West have not failed to notice the number of female tandem and haulage truck drivers now working with H.J. O'Connell on various projects including at the IOC and Wabush Mines. It's no accident.

Tom Day, manager of Safety and Human Resources, said the company is looking at women to fill the void left by many of its retiring operators or by people moving to major mining companies or heading out west.

Mr. Day said along with giving women an opportunity to work in the construction industry, H.J. O'Connell is looking at a largely untapped employment resource -the Labrador aboriginal communities. You have to look no further than the company's loader operator in the gravel-sand pit along the Trans-Labrador Highway to see O'Connell's is onto something with great potential, Mr. Day said.

Darlene Flynn took the mining technology course at the Labrador West campus of the College of the North Atlantic, but upon graduation never got hired by IOC.

Though she didn't get the job she originally wanted, she is glad to be working for H.J. O'Connell. She now drives 100-tonne trucks, stripping overburden at Wabush Mines. She is also training another woman, Kelly McLean on how to operate the haulage truck. Ms. McLean said she loves the work and is grateful for the opportunity to learn how to drive the vehicle. Ms. Flynn is thankful to O'Connell's for giving her valuable experience in the industry doing what she really enjoys.

Tandem truck driver, Krista Butler is from Cox's Cove and took her heavy equipment training in Holyrood at the Operating Engineers College. Upon completion she came to Labrador West to look for a job and is now driving for O'Connell Construction.

She said there was a much better chance of getting a job in her field in Labrador rather than on the Island. She can also operate loaders, graders and other equipment when required.

Men in the profession don't mind the arrival of women in the workforce either. Fred Buffett has worked in the mining and construction business for 23 years throughout Canada. He said from what he has seen, "they are just as good as the boys when it comes to driving and operating the equipment."

Gord Martin, who operates the loader on the shift with Ms. Flynn and Ms. McLean, said he has noticed an improvement since the women started working with the company; the trucks and equipment are much cleaner.

Brian Nichols, O'Connell general superintendent, said the women are working well and do not hesitate to ask questions and are eager to learn how to operate the equipment safely and properly.

While these employees have filled the gap for this summer, Mr. Knox, Mr. Day and regional manager Terry Curran said it is only a stopgap measure and more needs to be done. Mr. Curran said a more extensive quality training program has to be offered in Labrador West and H.J. O'Connell is ready to step up to the plate as a business willing to participate.

"We have the latest equipment for hand's on training and other services if it will help fill our employment needs," he said. "This is not just the major mining site in Newfoundland and Labrador but in all Atlantic Canada. It only makes sense to provide top-notch training programs where the students can get jobs upon completion of the program while being exposed to the work environment they have chosen."

Mr. Knox said it is time other parties, in particular government and the training institutions, stopped talking about what needs to be done and begin immediate action to address the situation. He notes all studies conclude industry, government and labour need to work together to collectively resolve the skills deficit.

"We are not just talking about the Labrador West mining industry," he explained. "Government is preparing several major projects including development of the Lower Churchill the construction of another oil processing facility in Newfoundland, Inco/CVRD's Long Harbour project and the development of the Hebron project. Where are they going to get the trained people needed to operate the equipment on these projects if they don't do more right now? And even now leaves them behind the eight ball as many people have already headed out west to Alberta and British Columbia." Shannon MacDonald, a single mom, is working with H.J. O'Connell at their batch plant. She agrees training should be provided in Labrador West and pointed out she was on a waiting list for a long time before getting the apartment she is presently living in with her daughter. Government has to consider the cost of living, she said.

"I can't afford to keep two living accommodations going at the same time and it is hard to find a place to live in Labrador West, so if I gave up my apartment I would have to end up going on a waiting list again once I came back," Ms. MacDonald said. "As well it is very expensive getting in and out of here. We have the equipment here, instructors here, the industry here to work in, and I know a lot of people who would take the program if it was offered in Labrador West."

Mr. Knox agrees with Ms. MacDonald.

"We need to focus on delivering the training programs in such a way, so that they do not cause a disruption to families and traditional ways of life for interested individuals," he stressed. "We have to adapt the program to the people's needs, bring the programs to areas of interest, make it convenient and the results will be obvious. We all know the problem with finding skilled workers. It's talked about in business circles, social circles and in the coffee shops. It's time to stop talking, think outside the traditional box and do something about it, together, now!"

Published August 27, 2007 -The Aurora

Paving the way

Inuit woman encourages others to operate heavy equipment



Gary Peckham photo/Maria Dicker stands in front of one of the pieces of equipment she operates for H.J. O'Connell Construction. The mother of seven from Nain wants others from her community to consider a career in heavy equipment operations.

BY GARY PECKHAM
Special to The Aurora

Maria Dicker is one step closer to realizing her dream. The path to becoming a heavy-duty equipment operator with H.J. O'Connell Construction has not been an easy one for Ms. Dicker, a 48-year-old mother of seven children from Nain, but she hopes the job will soon lead her to Voisey's Bay as a haulage truck driver with Inco/CVRD. The mother and grandmother has a diploma in social work and did get

occasional employment in her community, but was looking for more full-time work, so in 2003 she took part in an Orientation Trades and Technology (OTT) program offered to Labrador Inuit Association (LIA) members.

Part of the program was a visit to Labrador West and a tour of the mining operations at the Iron Ore Company of Canada and Wabush Mines.

"I fell in love with those big haulage trucks at the mines and really wanted to drive one," she said. "I applied for a job with Inco, but they were looking for people with experience."

While she was disappointed, she also became more determined. Dicker did some research and found a heavy-duty equipment operator program in Stephenville, NL. It was difficult to make the decision to leave her family and friends and unique culture in Labrador to take a course few, if any, women from the LIA had taken, but she felt her future was worth the sacrifice.

"It was very difficult to leave home and it would have been easier if I had someone to come with me and take the course," she pointed out. "My husband and children didn't like the idea of me leaving but they were supportive of my goal. It was a 26-week course, but I finished it in 19 weeks because I was anxious to get back home to Nain and my family."

Even with the training and experience garnered during her time in Stephenville, it was not enough to get her a job in Voisey's Bay. When she was offered the opportunity to drive haulage trucks and operate heavy equipment in Labrador West with O'Connell's, Dicker once again left her hometown. She said it's important to enjoy your work and she loves it at O'Connell's.

After four weeks of working, she gets a week off to return home. On one of her trips, she went back with pictures of some of the equipment she operated and her family was shocked to see her doing such work. They were proud of her accomplishments though.

Dicker said she is encouraging other members of her family and community to take training and gain experience in heavy equipment operations.

She admits it is very difficult for Inuit people to leave home and the unique way of life they have known for hundreds of years because they don't feel they have the education to get into the program and do the work. The grandmother, who is disappointed she will miss her grandson's first day of school because of work commitments, feels she is a great role model for those who are considering the possibility. She said her 18-year-old daughter is talking about following in her footsteps.

Dicker agrees with H.J. O'Connell's efforts to get a heavy equipment operator program offered in Labrador West, as it would be much easier to travel to Happy Valley-Goose Bay and back to Nain from the area. She noted it would also be good if the company offered a group program, which would encourage more

Inuit to take the course and get gainful employment.

Dicker said O'Connell's is a good employer and she's glad the company is giving her the opportunity to gain experience on different pieces of equipment.

O'Connell's, in an effort to find qualified operators, is hiring more women and is also looking at tapping into the potential aboriginal workforce of Labrador. Tom Day, manager of HS&E and Training with O'Connell's, said he is very pleased with Dicker's work and hopes her employment will pave the way for more aboriginals to look at heavy equipment operating as a career.



Harassment Policy

H.J. O'Connell Construction Ltd. in cooperation with the Joint Occupational Health & Safety Committee is committed to a healthy, harassment-free working environment for all our employees. This company wide policy is intended to prevent harassment of employees by dealing quickly and effectively with any incidents that might occur.

Harassment is any unwelcomed physical, visual or verbal conduct. It is against the law. Harassment may include verbal or practical jokes, insults, threats, personal comments or innuendo. It may take the form of posters, pictures or graffiti. It may involve touching, stroking, pinching or any unwelcome physical contact. Any behavior that insults or intimidates is harassment if a reasonable person should have known that the behavior is unwelcome.

Human Rights Codes throughout Canada protect individuals from harassment and other forms of discrimination on the basis of race, religion, sex, pregnancy, sexual orientation, marital status, physical disability, political opinion, color or ethnic, national or social origin and age. H.J. O'Connell Construction Ltd. will not tolerate harassment on the basis of any of those protected grounds.

It is the responsibility of any person within this company supervising one or more employees to take immediate and appropriate action to report or deal with incidents of harassment whether brought to their attention or personally observed. Under no circumstances should a legitimate complaint be dismissed or down played or the complainant told to deal with it personally.

H.J. O'Connell Construction Ltd. seeks to provide a safe, healthy and rewarding work environment for its employees. Harassment will not be tolerated within this company.

If you feel that you have been the victim of harassment, please contact us; we want to hear from you.

A handwritten signature in blue ink, appearing to read "Brian LeMessurier".

Brian LeMessurier
President

A handwritten date in blue ink, "July 19, 2012".

Date



Respectful Workplace Policy

H.J. O'Connell Construction Ltd. in cooperation with the Joint Occupational Health & Safety Committee is committed to providing a safe and respectful work environment for all our employees, sub-contractors and clients. This company wide policy is intended to prevent discrimination, harassment and violence against any of our employees by dealing quickly and effectively with any incidents that might occur.

All employees of H.J. O'Connell Construction Ltd. are entitled to pursue their duties in a respectful workplace. It is essential that everyone, regardless of role or position in the organization conduct themselves in a respectful manner in the workplace.

H.J. O'Connell Construction Ltd. will strive to create and maintain a work environment that is free from harassment, discrimination and violence, by not tolerating it in any manner or form. Where harassment, discrimination or violence has been determined to have occurred, progressive disciplinary actions, up to and including dismissal will be taken.

H.J. O'Connell Construction Ltd. has specific policies in place on Harassment and Violence in the Workplace which form the foundation for a respectful workplace. These policies outline the steps to follow whether you have been the victim or a witness to any form of harassment, discrimination or violence.

All employees are expected to;

- Respect the diversity brought to the workplace by other employees
- Create a respectful workplace through fostering respectful behavior towards others
- Challenge inappropriate behavior and / or objectionable conduct when it occurs and refuse to participate; and
- Report inappropriate behavior and / or objectionable conduct to a supervisor or manager

H.J. O'Connell Construction Ltd. seeks to provide a safe, healthy and rewarding work environment for its employees. Harassment, discrimination and violence will not be tolerated.

A handwritten signature in blue ink, appearing to read "Brian LeMessurier", is written over a horizontal line.

Brian LeMessurier
President

July 19, 2012.
Date



Code of Ethics Policy

Acting with integrity is fundamental to the way that H.J. O'Connell Construction Ltd. operates. This Code of Ethics Policy outlines the principals and standards which all employees are expected to comply with in the performance of their duties.

In conducting our business, we will:

- Communicate this Code of Ethics to all employees;
- Comply with all applicable laws, regulations and statutory obligations in the provinces and municipalities in which we operate;
- Act honestly and with integrity in all areas of our business dealings;
- Respect the values of others;
- Accept responsibility and be accountable for our actions;
- Avoid situations resulting in a conflict of interest, bribery, or the use of inducements to secure business;
- Use H.J. O'Connell Construction Ltd. assets for Company purposes only;
- Periodically review and revise this Code of Ethics to maintain its relevance.

Actively applying the principles of this Code of Ethics is integral to the ongoing success of our business. It is the responsibility of each individual to maintain the highest standards of ethical behaviour.

A handwritten signature in blue ink, appearing to read "Brian LeMessurier", is written over a horizontal line.

Brian LeMessurier
President

July 19, 2012.
Date



Workplace Violence Policy

It is the policy of H.J. O'Connell Construction Ltd. that while at workplaces under their authority all employees, clients, subcontractors, and visitors are entitled to a positive, respectful, productive, and safe environment. These workplaces shall remain free of behaviour, actions, or language causing or contributing to workplace violence. Workplace violence will not be tolerated under any circumstance and will be cause for immediate dismissal.

No employee or subcontractor shall, use, or threaten to use a firearm, explosive, or other device that may be construed as a dangerous weapon to cause injury or property damage. Knives, box cutters, letter openers, or other job related tools shall only be used for their intended purpose. The inappropriate use or threatened use of such items in a violent act or manner contrary to their intended use will not be tolerated and subject to disciplinary action.

Employees must report all acts or threats of workplace violence immediately to a supervisor or manager. In the case of an emergency or imminent danger, employees shall initiate the Emergency Response Plan and if possible report the situation directly to law enforcement officials. H.J. O'Connell Construction Ltd. shall act immediately on each reported incidence of workplace violence.

Any employee, who upon becoming aware of a potential or an actual incidence of workplace violence, fails to report it or take immediate corrective action may be subject to disciplinary action.

All employees of H.J. O'Connell Construction Ltd. have a responsibility to report and where possible prevent workplace violence. All employees, sub-contractors, clients and the general public shall be treated in a professional and equitable manner with dignity and respect at all times.

A handwritten signature in blue ink, appearing to read "Brian LeMessurier", is written over a horizontal line.

Brian LeMessurier
President

A handwritten date "July 19, 2012" is written in blue ink over a horizontal line.

Date



Equitable Employment Policy

H.J. O'Connell Construction Ltd. is committed to fair hiring practices based on the principles of merit and equity. This company wide policy is intended to prevent discrimination on the basis of race, religion, sex, pregnancy, sexual orientation, marital status, physical disability, political opinion, age, colour, or ethnic, national or social origin.

Recruitment and selection activities must be conducted in a transparent manner that is fair, objective, consistent, equitable, non-discriminatory and legally defensible. All job postings will contain a statement indicating that the company is an equal opportunity employer and encourage all qualified people to apply.

The factors to be considered when assessing merit include: education, experience, skills, knowledge, personal attributes and where applicable, years of experience. The fair treatment of people by acknowledging and making provisions for their differences in a process that is free from systemic barriers will help ensure an equitable process.

Our fair hiring process includes:

- Consistent recruitment and selection processes and consistent treatment of applicants and candidates throughout the processes
- Screening and selection criteria that are related to job requirements
- Consistent screening, selection criteria and evaluation of candidates for similar positions
- Interviews, rating scales, related assessments and reference checks that are impartial and relevant to the position
- Determination of a successful candidate that is based upon merit as outlined in this policy.

H.J. O'Connell Construction Ltd. is committed to recruitment and selection processes that comply with Human Rights Legislation, based on assessing the applicants ability to do the job and not on assessing the applicants protected personal characteristics such as gender, age, or marital status. H.J. O'Connell Construction Ltd. is proud to be an Equal Opportunity Employer.

A handwritten signature in blue ink, appearing to read "Brian LeMessurier", is written over a horizontal line.

Brian LeMessurier
President

July 19, 2012.
Date



Nalcor Energy

Lower Churchill Project

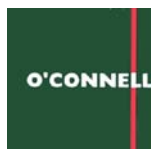
Construction of Earthworks at Various Power Distribution Sites

Appendix A11

Provincial Benefits Questionnaire

Annex 3

CV – Willie Keats



WILLIE KEATS, P. ENG.
VICE PRESIDENT – OPERATIONS

Willie is presently employed as Vice President - Operations. Prior to his current position he was District Manager / Construction Manager for 11 years. His experience has been predominately related to hydro electric developments in Newfoundland and Labrador and Ontario; and site work development including work associated with the Fixed Link for Prince Edward Island and the Hibernia site works in Mosquito Cove, NL. He also has considerable experience associated with road and bridge construction and wharf construction. He has a strong background in project management, estimating and Quality Assurance.

PROFESSION:	Professional Engineer
EXPERIENCE:	Over 30 Years
QUALIFICATIONS:	<p>PC Applications & Basic Programming – Bay St. George Community College</p> <p>Bachelor of Civil Engineering – Memorial University of Newfoundland</p> <p>Quality Assurance Course – Batalas International, Bournemouth, England.</p> <p>Currently Enrolled in MBA – University of British Columbia</p>
SPECIALIZATIONS:	<p>Project Management</p> <p>Quality Assurance</p>

CAREER SUMMARY

2008 – Present	<p>H.J. O’Connell Construction Ltd. Vice President - Operations</p> <ul style="list-style-type: none"> ◆ Construction of 200 MW Wuskwatim Hydro Electric Project – Thompson, Manitoba ◆ Various projects involving railways, hydroelectric projects, and industrial/mining concrete and site works projects
1995 – 2008	<p>H.J. O’Connell Construction Ltd. District Manager</p> <ul style="list-style-type: none"> ◆ Responsible for all concrete works at Voisey’s Bay ◆ Construction of 30 MW Beeton Hydro Electric Project – Grand Falls-Windsor, NL ◆ Marine facility – Cartwright, Labrador



WILLIE KEATS, P. ENG.
VICE PRESIDENT – OPERATIONS

- ◆ Various projects involving road, bridge, water, sewer and site works.

1979 – 1995

McNamara Construction Company
Project/Construction Engineer and Quality Assurance Manager

- ◆ Construction of four lane TCH at Steady Brook
- ◆ Site Development for Fixed Link Project – PEI
- ◆ Construction of four lane TCH at Corner Brook
- ◆ Site works for Hibernia GBS
- ◆ Three span structural twin box beam bridge at Ossokmanuan Reservoir Bridge – Labrador
- ◆ Magpie Hydro Electric Project – Wawa, Ontario
- ◆ Cat Arm Hydro Electric Project
- ◆ Hynes Lake Hydro Project

PROFESSIONAL AFFILIATIONS:

- ◆ Association of Professional Engineers and Geoscientists of Newfoundland and Labrador

SAFETY TRAINING:

- ◆ Safety Orientation First Aid (Heart Start)
- ◆ Fall Protection
- ◆ Transportation of Dangerous Goods (TDG)

EXHIBIT 14

PERFORMANCE SECURITY

PERFORMANCE BOND

No. _____ \$

KNOW ALL MEN BY THESE PRESENTS THAT

_____ as Principal, hereinafter called the Principal, and _____, a corporation created and existing under the laws of _____, and duly authorized to transact the business of Suretyship in _____, as Surety, hereinafter called the Surety, are held and firmly bound unto _____ as Obligee, hereinafter called the Obligee, in the amount of _____ Dollars, (\$ _____) lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a written contract with the Obligee, dated the _____ day of _____, for _____ in accordance with the contract documents submitted therefore which are by reference made part hereof and are hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal shall promptly and faithfully perform the Contract then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Whenever the Principal shall be, and declared by the Obligee to be, in default under the Contract, the Obligee having performed the Obligee's obligations thereunder, the Surety may promptly remedy the default, or shall promptly

1. complete the Contract in accordance with its terms and conditions or
2. obtain a bid or bids for submission to the Obligee for completing the Contract in accordance with its terms and conditions, and upon determination by the Obligee and the Surety of the lowest responsible bidder arrange for a contract between such bidder and the Obligee and make available as work progresses (even though there should be a default, or a succession of defaults, under the contract or contracts of completion, arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the Contract price", as used in this paragraph, shall mean the total amount payable by the Obligee to the Principal under the Contract, less the amount properly paid by the Obligee to the Principal.

Any suit under this Bond must be instituted before the expiration of two (2) years from the date on which final payment under the Contract falls due.

The Surety shall not be liable for a greater sum than the specified penalty of this Bond.

The attached Rider, signed by the Principal and the Surety, is part of and incorporated into this Bond.

No right of action shall accrue on this Bond, to or for the use of, any person or corporation other than the Obligee named herein, or the heirs, executors, administrators, assigns or successors of the Obligee.

IN WITNESS WHEREOF, the Principal and the Surety have Signed and Sealed this Bond this day of _____ .

SIGNED AND SEALED in the presence of:

_____)		
_____)		
_____)		
Witness _____)	[*NAME OF PRINCIPAL]	(SEAL)
_____)		
_____)		
Witness _____)	[*NAME OF SURETY]	(SEAL)

RIDER TO PERFORMANCE BOND NO.

TO BE ATTACHED TO AND FORM PART OF PERFORMANCE BOND NO. _____ , dated concurrently with the execution of this Rider, issued by the _____ , as Surety, on behalf of _____ , as Principal, and in favour of _____ , as Obligee.

WHEREAS, upon the request of the Principal and Obligee, and in consideration of \$1.00 and other valuable consideration the receipt and sufficiency of which is acknowledged by the Surety, **IT IS UNDERSTOOD AND AGREED THAT** the above described bond is hereby amended to include the following paragraphs:

1. Surety hereby waives notice of any change to the Contract or the related subcontracts, including changes to time of performance, scope of work and price.
2. No waiver by the Obligee of any provision of the Contract shall release the Surety of its obligations given under this Bond although in no event shall the obligations of the Surety under the Bond exceed those of the Principal.
3. To the limit of the amount of this Bond, if there is a failure by the Principal to perform or otherwise to fulfil its obligations under and comply with the terms of the Contract which has neither been remedied by the Principal or expressly waived by the Obligee in writing, and if the Principal is declared in default and the Surety is called upon under this Bond, then the Surety is obligated to the Obligee for all obligations of the Principal under the Contract, including:
 - (a) the responsibilities of the Principal for correction of defective design, work and materials, and for completion of the Contract;
 - (b) the fulfilment by the Principal of all Performance Guarantees, as defined and specified in the Contract; and
 - (c) the obligation to pay liquidated damages, as specified in the Contract.
4. For purposes of any suit under this Bond, final payment shall be deemed to fall due on the date of the Final Completion Certificate, as defined in the Contract.
5. This Performance Bond shall expire two (2) years after the date of the Final Completion Certificate, as defined in the Contract.

IT IS FURTHER UNDERSTOOD AND AGREED THAT nothing herein shall be held to change, alter or vary the terms of the above described Bond except as hereinbefore set forth.

IN WITNESS WHEREOF, the Principal and the Surety have Signed and Sealed this Performance Bond Rider this _____ day of _____.

SIGNED AND SEALED in the presence of:

_____)
Witness _____)
_____)
Witness _____)

[*NAME OF PRINCIPAL] (SEAL)

[*NAME OF SURETY] (SEAL)

PAYMENT BOND

No. _____

\$ _____

KNOW ALL MEN BY THESE PRESENTS THAT

_____ hereinafter
called "PRINCIPAL", and

_____ a corporation created and existing under the laws of _____ and duly authorized to transact the business of Suretyship in _____, hereinafter called "SURETY", are, subject to the conditions hereinafter contained, held and firmly bound unto _____ as TRUSTEE, hereinafter called "OBLIGEE", for the use and benefit of the Claimants, their and each of their heirs, executors, administrators, successors and assigns in the amount of

_____ Dollars (\$ _____) lawful money of Canada for the payment of which sum well and truly to be made PRINCIPAL and SURETY, jointly and severally, bind themselves and each of them and their and each of their heirs, executors, administrators, successors and assigns firmly by these presents.

WHEREAS PRINCIPAL has entered into a written Contract with **OBLIGEE** dated the _____ day of _____, 20_____ for

_____ which Contract (including the drawings, contract documents, conditions and other documents referred to therein) is by reference made a part hereof, as fully and to the same extent as if recited in full herein and is hereinafter referred to as the "Contract".

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if **PRINCIPAL** shall promptly make payment to all Claimants as hereinafter defined for all labour and material used or reasonably required for use in the performance of the Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

- (1) A Claimant for the purpose of this Bond is defined as one having a direct contract with **PRINCIPAL** for labour, material, or both, used or reasonably required for use in the performance of the Contract, labour and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment directly applicable to the Contract provided that a person, firm or corporation who rents equipment to **PRINCIPAL** to be used in the performance of the Contract under a contract which provides that all or any part of the rent is to be applied toward the purchase price

thereof shall only be a claimant to the extent of the prevailing industrial rental value of such equipment for the period during which the equipment was used in the performance of the Contract.

- (2) **PRINCIPAL** and **SURETY** hereby jointly and severally agree with **OBLIGEE** as **TRUSTEE** that every Claimant who has not been paid as provided for under the terms of its contract with **PRINCIPAL** before the expiration of a period of ninety (90) days after the date on which the last of such Claimant's work or labour was done or performed or materials were furnished by such Claimant, may as a beneficiary of the trust herein provided for, sue on this Bond, prosecute the suit to final judgment for such sum or sums as may be justly due to such Claimant under the terms of its said Contract with **PRINCIPAL** and have execution hereon. Provided that **OBLIGEE** is not obliged to do or take any act, action or proceeding against **SURETY** on behalf of the Claimants or any of them to enforce the provisions of this Bond. If any act, action or proceeding is taken either in the name of **OBLIGEE** or by joining **OBLIGEE** as a party to such proceeding, then such act, action or proceeding shall be taken on the understanding and basis that the Claimants or any of them who take such act, action or proceeding shall indemnify and save harmless **OBLIGEE** against all costs, charges and expenses or liabilities incurred thereon and any loss or damage resulting to **OBLIGEE** by reason thereof. Provided further that, subject to the foregoing terms and conditions, the Claimants or any of them may use the name of **OBLIGEE** to sue on and enforce the provisions of this Bond.
- (3) No suit or action shall be commenced hereunder by any Claimant:
- (a) Unless such Claimant shall have given written notice within the time limits hereinafter set forth to each of **PRINCIPAL**, **SURETY** and **OBLIGEE**, stating with substantial accuracy the amount claimed. Such notice shall be served by mailing the same by registered mail to **PRINCIPAL**, **SURETY** and **OBLIGEE** at any place where an office is regularly maintained for the transaction of business by such persons or served in any manner in which legal process may be served in the Province or other part of Canada in which the subject matter of the Contract is located. Such notice shall be given,
- (i) in respect of any claim for the amount or any portion thereof required to be held back from the Claimant by **PRINCIPAL** under either the terms of the Claimant's contract with **PRINCIPAL** or under the Mechanics' Liens Legislation applicable to the Claimant's contract with **PRINCIPAL** whichever is the greater within one hundred and twenty (120) days after such Claimant should have been paid in full under the Claimant's contract with **PRINCIPAL**;
- (ii) in respect of any claim other than for the holdback or portion thereof referred to above within one hundred and twenty (120) days after the date upon which such Claimant did or performed the last of the work or labour or furnished the last of the materials for which such claim is made under the Claimant's contract with **PRINCIPAL**;
- (b) After the expiration of one (1) year following the date on which **PRINCIPAL** ceased work on the Contract including work performed under the guarantees provided in the Contract.

- (c) Other than in a court of competent jurisdiction in the Province of Canada in which the subject matter of the Contract or any part thereof is situated and not elsewhere, and the parties hereto agree to submit to the jurisdiction of such court.
- (4) The amount of this Bond shall be reduced by and to the extent of any payment made in good faith and in accordance with the provisions hereof, inclusive of the payment by **SURETY** of Mechanics' Liens which may be registered against the subject matter of the Contract, whether or not claim for the amount of such lien be presented under and against this Bond.
- (5) **SURETY** shall not be liable for a greater sum than the specified amount of this Bond.

IN TESTIMONY, WHEREOF, PRINCIPAL has hereto set its hand and affixed its seal, and **SURETY** has caused its corporate seal to be affixed hereto, in accordance with its regulations and in the presence of its duly authorized officers this

_____ day of _____ 20____.

THE **COMMON SEAL** of **PRINCIPAL**
was hereon affixed in the presence of:

)
)
) By
)
)

) And
(Seal)

(Witness)

(PRINCIPAL)

THE **COMMON SEAL** of **SURETY**
was hereon affixed in the presence of:

)
)
) By
)
)

) And
(Seal)

(Witness)

(SURETY)

SURETY's Address