

**Terms of Reference
Independent Review of the
May 17th, 2017 Churchill River Flooding Event**



Government of Newfoundland and Labrador

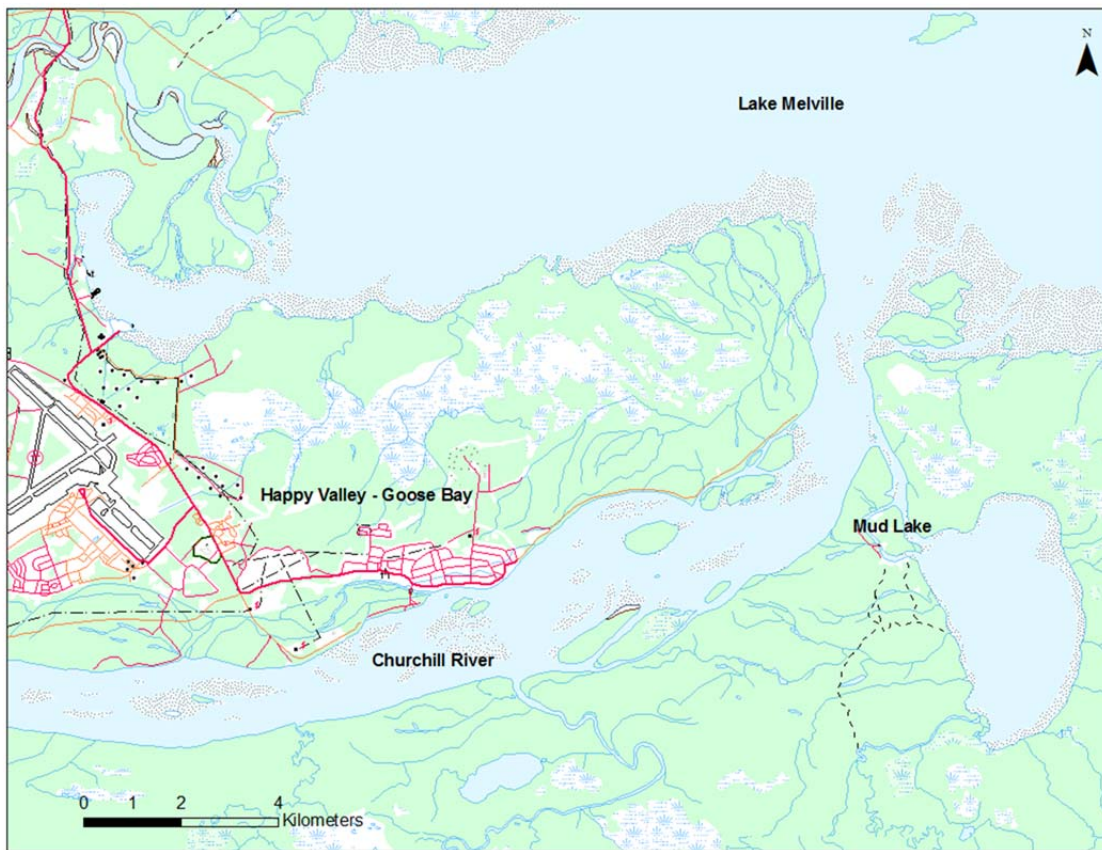
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1.0 Background

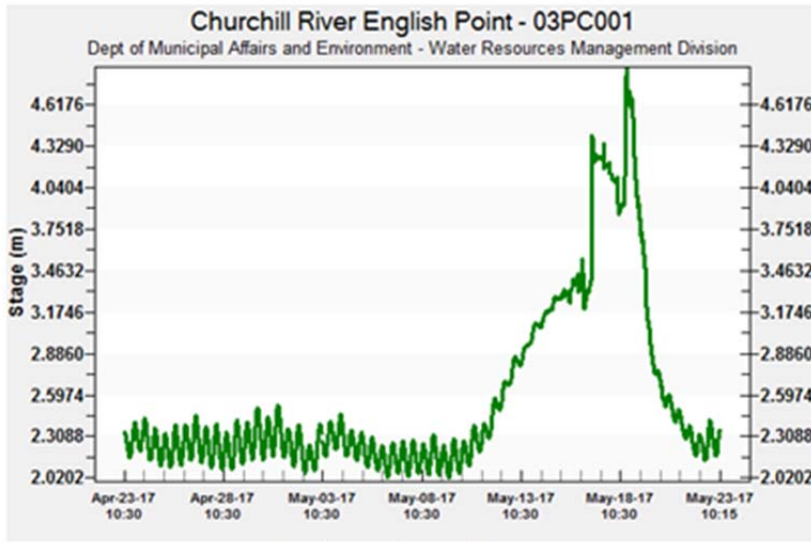
Mud Lake is a small community alongside the Churchill River in Central Labrador, located approximately 10 km east of Happy Valley – Goose Bay (see Figure 1). There is a population of approximately 80 people and there is limited access to the community. There are no roads leading to the community and access is usually gained by means of boat or snowmobile.

Figure 1: Location Map



As reported by the hydrometric station at English Point, water levels started increasing in the Churchill River on May 11th, 2017 (Please see Figure 2). Water levels began rising in Mud Lake on May 16th, 2017. The water rose to levels deemed unsafe on the early hours of May 17th, 2017 and evacuation of residents from Mud Lake to Happy Valley-Goose Bay was initiated.

Figure 2: Stage at English Point Water Level Station on Churchill River



The evacuation had to be performed using helicopters as water levels and ice conditions were not amenable to evacuation by boat. As of May 19th, 2017 all but one resident and most pets had been transported from Mud Lake to Happy Valley – Goose Bay and remained there for a number of days. Some of the residents are still living in Happy Valley - Goose Bay area. Extensive flooding was also reported in the Mud Lake Road region north of Happy Valley – Goose Bay on the western side of the Churchill River. Damage to properties in both areas was significant.

Mud Lake has a previous history of flooding but not to the extent of the events that occurred in May, 2017.

The Government of Newfoundland and Labrador has committed to an independent review of the May 17, 2017 flooding event.

2.0 Objective

This is to be an independent review into the flooding which occurred in Mud Lake and Happy Valley-Goose Bay on May 17th, 2017.

The objectives of this review are to:

- Provide a detailed explanation of the reasons for the May 17th, 2017 flooding event considering all probable factors.

- Provide guidance on what measures need to be implemented to mitigate and prevent future flooding and to provide advance warning to residents of Mud Lake and Happy Valley-Goose Bay.
- The review will take into consideration traditional knowledge of the residents of the impacted area.

The Scope of Work will include:

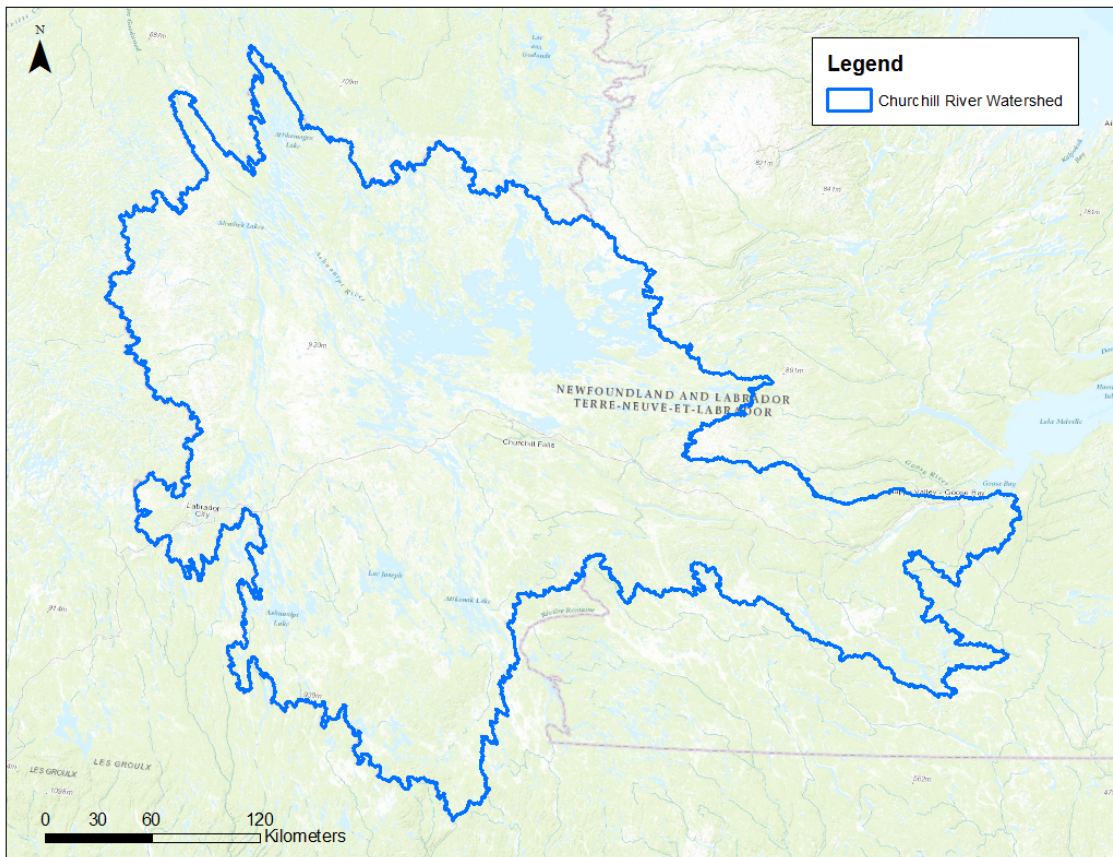
- Gathering information and local evidence from relevant stakeholders including traditional knowledge experts.
- Review of previous studies of flood occurrences in other dammed rivers of similar latitude during spring melt.
- Review of ice jam occurrences on the Churchill River and in the surrounding region.
- Review of climatic and hydrometric data.
- Review of any relevant available data sets.
- Review of water level and discharge data from Muskrat Falls and Smallwood reservoirs and other relevant gauges within the Churchill River catchment area.
- Review of operational practices at Muskrat Falls development and Churchill Falls development.
- Review photographic record and satellite ice imagery of the ice conditions in preceding years and 2017.
- Review bathymetric cross-sections of the Churchill River.
- Review data related to tidal influences from the Atlantic Ocean.
- Review ice observation program reports.
- Review relevant reports undertaken by Nalcor.
- Review actions and impacts of the Muskrat Falls project since Fall 2016 and associated implications for the Community of Mud Lake and the Town of Happy Valley-Goose Bay.
- Recommended actions to mitigate and prevent future flooding in Mud Lake and Happy Valley-Goose Bay and to provide advance warning to residents of Mud Lake and Happy Valley-Goose Bay.

3.0 Study Area

The study area shown in Figure 1 includes the Churchill River along with the communities of Mud Lake and Happy Valley-Goose Bay situated alongside the River. The focus is on the communities of Mud Lake and Happy Valley-Goose Bay.

The Churchill River watershed is shown in Figure 3.

Figure 3: Churchill River Watershed



4.0 Study Administration

The study will be managed by an Independent Technical Expert Advisor (ITEA). Throughout the study, the engineering consultant must:

1. Provide a presentation at the study kickoff meeting that describes in detail the approach the consultant will take to complete the study tasks. The Project Manager must attend this meeting and present in person. Meeting minutes are to be taken by the consultant and provided to the ITEA within one week of the meeting.
 2. The ITEA and the selected consultant will be required to visit the study area and meet traditional knowledge experts during the early part of the study. There will be a study progress update meeting between ITEA and the consultant in August.
 3. Develop a work schedule and description of work output such that the study and associated outputs may be monitored for both time and costs. Updates are to be provided with biweekly progress reports.
 4. Provide biweekly progress reports and discuss the various aspects of the investigation with the ITEA as required or requested.
 5. Provide assurance that no extra funds will be expended before obtaining approval for any additional work. All anticipated expenditures are to be included in the initial cost estimate.
 6. Any mapping work must be done in the latest version of ESRI ArcGIS.
 7. Provide five (5) printed copies of the draft version of the final report and five (5) printed copies of the technical appendices. Along with the printed copies of the draft report:
 - The text of the draft report and technical appendices must be on a USB flash drive in Microsoft Word and Adobe PDF format.
 - Provide all technical drawings and graphics on the USB flash drive in AutoCAD file format and as an ESRI ArcGIS Geodatabase.
 - The final report cannot be printed until the Independent Technical Lead has signed off on the draft report.
 8. The consultant must provide ten (10) printed copies of the final report and ten (10) copies of the technical appendices. The consultant must make a realistic estimate of the printing cost for the final report based on the anticipated number of pages. No claim for extra printing costs will be accepted. In addition to the printed copies of the final report:
 - The text of the final report and technical appendices must be on a USB flash drive in Microsoft Word and Adobe PDF format.
 - While some products are digital, these must also be printed and included in the report or its appendices. The report and the technical appendices must be standalone in the sense that it does not reference or rely upon material that is not contained within it.
 - All technical drawings and graphics must be provided on the USB flash drive as an ESRI ArcGIS Geodatabase.
 - A complete digital copy of all data, information, and files used in the study.
- a) Throughout the study, the consultant is to comply with the most current version of the Occupational Health and Safety Act and its Regulations. Consultant should obtain a Letter of

Clearance from the Newfoundland and Labrador Workplace Health Safety & Compensation Commission.

9. Upon completion of the study, the consultant must provide a detailed PowerPoint presentation outlining all steps of the study, including: the processes followed, the software used, the field program, the methods used, the assumptions made, products developed, and the recommendations made. The presentation should use relevant photos, graphics, maps, and work flowcharts; it should not exceed 100 slides. The presentation, or a portion of it, will be used by Government of Newfoundland and Labrador and its agencies for public information sessions, conference presentations, and will be made available on its website.
10. The ITEA and the consultant will present the draft study report to the local residents for input and discussion.
11. The study report will be made publicly available by the Government of Newfoundland and Labrador.

5.0 Independent Technical Expert Advisor

An Independent Technical Expert Advisor (ITEA) will be responsible for the technical supervision and overall administration of the study.

The consultant will report to the ITEA regularly and maintain liaison with the ITEA on all aspects of the study. If needed, the consultant will be required to attend meetings with the ITEA to discuss the technical aspects of the study.

The consultant must provide biweekly progress reports to the ITEA. Clarification may be requested by the ITEA on any item in the progress report. The consultant will be expected to respond to any reasonable request of the ITEA in a thorough and diligent manner.

Any deviation in the methodology, scope or assigned staff for the study described in the consultant's proposal must be reviewed and approved by the ITEA. The ITEA will be available to provide, when possible, technical advice and reasonable assistance to the consultant.

ITEA will keep the Government of Newfoundland and Labrador fully informed about the progress of his and consultant's work on this project.

6.0 Financial Consideration

An itemized study budget shall be submitted by the consultant. Total cost of the study should not exceed \$95,000 plus HST.

The consultant shall keep proper records of the work performed and expenses incurred during the study. Progress reports, that relate progress to the work program and output schedule, shall be submitted with the invoices.

The consultant shall submit invoices for amounts payable to the consultant, subject to a work schedule and description of work output, as required by the terms of a formal contract with the Government of Newfoundland and Labrador.

7.0 Submission of Proposals

7.1 Inquiries and Communication

All inquiries and requests for clarification are to be directed in writing and addressed to:

Haseen Khan, P.Eng.
Director, Water Resources Management Division
Municipal Affairs and Environment
Government of Newfoundland and Labrador
P.O. Box 8700 St. John's, NL
A1B 4J6

Written inquires and requests for clarification will be accepted up to 24 hours prior to the proposal submission deadline date. Inquiries and requests for clarification received after this date will not be addressed. Verbal information or representations shall not be binding upon the Government of Newfoundland and Labrador. Only written changes, alterations, modifications or clarifications are binding. In order to be valid all such changes, alterations, modifications or clarifications shall be issued in the form of addenda and all such addenda shall become a part of this study.

7.2 General Instructions

Five (5) copies of the proposal are to be submitted to:

Haseen Khan, P.Eng.
Director, Water Resources Management Division
Municipal Affairs and Environment
Government of Newfoundland and Labrador
P.O. Box 8700 St. John's, NL
A1B 4J6

- b) Proposals must be received at the address above no later than 3:00pm local time on the date of the proposal submission deadline.
- c) Proposals received and not conforming to the general instructions will be returned to the consultant(s) without consideration.
- d) Proposals received via facsimile machine will not be accepted.
- e) All prices quoted in the proposal are to be in Canadian funds and are not to include tax (HST).
- f) Proposals must clearly show the complete company name, nearest office location to the study area, and name and telephone number of primary contact person(s).
- g) All hard copies of proposals should be on 8 ½ inch x 11-inch format paper printed on both sides.
- h) A digital copy of the proposal must also be submitted in the portable Adobe document format (PDF) on a USB flash drive, CD-ROM or DVD-ROM.
- i) Consultants are entirely responsible for any costs or expenses related to the preparation and submission of proposals.
- j) The laws of the Province of Newfoundland and Labrador shall govern this proposal and any subsequent contract resulting from this proposal.
- k) The Province of Newfoundland and Labrador reserves the right to not accept any proposals.

8.0 Proposed Study Schedule

The study will be undertaken for the fiscal year 2017-18. The following table provides the timeframe given for the completion of this study:

Table 1: Study Timeframe

Event	Date
Proposal Submission Deadline	July 7, 2017
Contract award date (estimated)	Week of July 17, 2017
Draft Final Report Submission date	August 17, 2017
Final Report Submission Date	September 7, 2017
Submission of Invoices Deadline Date	September 29, 2017

9.0 Proposal Requirements

The Independent Technical Expert Advisor will consider only proposals meeting the following mandatory criteria:

1. Five (5) copies of the proposal received on time.
2. Proposed methodology: The format and contents of the proposal must provide sufficient detail so that a technical evaluation of the proposal can be made. The proposed methodology must be properly presented to provide a clear picture of the level of effort and appropriateness of the methodology.
3. Organization chart: The chart should indicate the names of the individuals to be involved in the study and the lines of responsibility. The Project Manager must be a water resources engineer with at least ten years of experience in water resources projects. CV's of all project staff must be provided.
4. The engineers or geoscientists working on the review are required to be licensed with PEGNL (Professional Engineers and Geoscientists of Newfoundland-Labrador) or be eligible to transfer to PEGNL from another professional engineering and geoscientist association from another province or other Canadian jurisdiction. The engineering consultant is also required to apply for a PEGNL Permit to Practice.
5. Work schedule: The work scheduled is to be in compliance with the proposed study schedule.
6. Assumptions:
 - Prior to submitting their proposal, consultants should confirm their assumptions with the ITEA.
 - All assumptions made by the consultant throughout the proposal must be summarized again in one section of the proposal.
7. Estimate of costs: The cost estimates should reflect the level of effort. The consultant is to include and identify all anticipated expenditures in the following table (items must not include tax):
8. One of the evaluation criterion is to provide 3 (three) reference examples of work related to the flood investigation study.

It is imperative that the consultant clearly provide the details of any additional anticipated costs. This includes costs due to uncertainties, inadequate information at the time of submission of the proposal, or any other reason.

10.0 Evaluation Procedure

The Independent Technical Expert Advisor will lead the proposal evaluation process.

As flood investigation studies are technical in nature, the technical quality of the proposal, the experience of the study team, and the total cost of the study each will be important criterion in evaluating and selecting the consultant to undertake the study. The Independent Technical Lead will use the evaluation criteria and weighting factors, identified in the table below to evaluate the proposals submitted:

Table 2: Evaluation Criteria

Item	Evaluation Criteria of the proposal
1.0	Quality of Submission (50%)
1.1	Comprehensive knowledge of issues
1.2	Sound appreciation of the aspects that may be of secondary importance
1.3	Specific information required to assess and rank each proposal
2.0	Relevant Experience (25%)
2.1	Adequate expertise and competence in study management
2.2	Adequate expertise and competence in technical areas of flood Investigation
2.3	Demonstrated experience in completing flood investigation studies on budget and on time (Consultant to provide 3 references)
3.0	Cost Proposal (25%)

11.0 Access to Information

The Government of Newfoundland and Labrador is subject to the provisions of the **Access to Information and Protection of Privacy Act**. Section 27 of the **Act** excludes the disclosure of information that would be harmful to the business interests of a third party and any disclosure by the Government of Newfoundland and Labrador would be subject to that provision.