

Request for Proposal

For

Whitney Dam

Dam Safety Review Update and Public Safety Assessment

In Prince Edward County



Requested by Quinte Conservation Authority
July 5th, 2021

RFP Contact:

msmith@quinteconservation.ca

Closing:

Wednesday, July 21st, 2021 at 12:00 pm

Quinte Conservation
RR#2
2061 Old Highway 2
Belleville, ON
K8N 4Z2

Introduction

Quinte Conservation (QC) comprises the drainage basins of the Moira, Napanee, and Salmon Rivers and all of Prince Edward County. We are presently reviewing our dam safety program and have identified that a dam safety review is due to be completed for Whitney Lake Dam.

Photos of the dam are included in Appendix A and a location map is included in Appendix B.

Background

Whitney Dam was constructed in 1975 to maintain the level of Consecon Lake in addition to providing water to a former downstream mill. It is located in Hillier, adjacent to Hwy 33, east of the village of Consecon.

The Whitney Dam is a 16m concrete weir and spillway with an eight, five and two inch low flow valves incorporated into the structure. The two small valves are permanently stuck closed and the large valve is permanently stuck open. The main spillway is six inches below the remainder of the structure, during periods of high flows the remainder of the structure serves as an emergency spillway. An earth berm to the south originally directed water over the dam. However, the berm has since been removed which allows a bypass around the dam. As part of this DSR determine, whether this embankment should be reinstated.

Scope of Work

Quinte Conservation is requesting a dam safety review update be completed on the Whitney Dam. The review will be completed in accordance with the Dam Safety Reviews Best Management Practices (OMNR, 2011). It is anticipated that the work will include all the components of a dam safety review.

Based on the outcome of the preliminary dam classification that will be completed as part of this exercise, a determination will be made of the Inflow Design Flood (IDF) for the structure.

Depending on the outcome of the classification of the dams a dam break analysis may be warranted and is to be completed as part of this study. The consultant will include a **contingency** item for this eventuality.

Frequency analysis, regional frequency analysis, hydrologic modelling, flood routing and hydraulic analyses shall be undertaken in accordance with the Technical Guide – River and Stream Systems: Flooding Hazard Limits, (OMNR, 2002).

A stability analysis of the structure is to be undertaken to determine if dam safety criteria are satisfied. A seismicity assessment should also be included.

Finally, Quinte Conservation is concerned about public safety near this dam. A Public Safety Assessment (PSA) is to be completed to identify potential public safety hazards. The PSA is to be completed in accordance with the Public Safety Around Dams Best Management Practices (OMNR, 2011). A recommendation should be made as to whether a Public Safety Plan should be completed. Provide a **contingency** for completion of a Public Safety Plan.

Recommended actions and maintenance activities should be provided including a timeline for completion and estimated budget.

MNRF 2011 Technical Bulletins should be followed for all aspects of the project scope.

Available Data

Quinte Conservation will make available all the documentation pertinent to the dam. To this end we have completed a preliminary review of the documents and find the reports listed below may be of some assistance. The consultant is directed to include the appropriate amount of time to review our files to determine if any further engineering reports may be available.

Known Reports or Data

- Whitney Dam Improvements – Totten Sims Hubicki Assoc., 1986
- Whitney Dam AutoCAD's – Quinte Conservation, 2019
- Floodplain Mapping of Consecun Creek
- Floodplain Mapping of Prince Edward Region Watershed
- QC Inspection Reports – 2008, 2013, 2018
- Photos – 2005 to present

Study Deliverables

Reports

Reports, charts, tables and other documents are to be provided in Microsoft Office format and in Adobe Acrobat portable document format (.pdf). Specifically, a PDF version of the complete report and a PDF version of the Executive Summary are required. Spreadsheets shall be provided in Microsoft Excel format.

All photographs documenting any field investigations shall be taken using a high resolution digital camera. All photographs are to be provided both in an original unedited form and annotated with the photo description. The reports shall contain colour copies of the annotated photographs. Copies shall be printed with no more than two (2) photographs per page.

All drawings submitted under this contract are to be prepared in AutoCAD and comply with owner approved standards and conventions for drawing size, surround, layering, line weights, etc. The final drawings are to be provided in hard copy bound with the report and electronically in AutoCAD and Adobe Acrobat portable document format (pdf).

Hydrologic, hydraulic, routing and dam break models used in the study are to be provided digitally, including executable code, input data and output. User manuals for the models are to be provided in hard copy and in electronic form.

The data and electronic version of the report are to be organized into appropriate directories and subdirectories, and a "README" file(s) included to assist the reader in locating and using the data. A copy of this CD-ROM or USB mass storage device is appended to each bound copy of the report.

Three, bound, hard copies of the report are to be provided.

Interim Reports

The consultant will submit interim reports to the owner for comment after completion of each of the following stages:

- data collection and site inspection
- flood flow estimates, flood routing models and preliminary incremental consequence category
- dam break analysis, confirmation of the incremental consequence category, and determine IDF conditions
- dam and foundation assessment

One copy of each interim report shall be submitted. The interim report shall be consistent in both format and content with the final report requirements for the section of the project that on which it is reporting. The interim reports shall include:

- summary of progress to date
- significant findings of the current phase of the study
- comments on possible implications on subsequent project components

Final Report

Two (2) copies of the final Dam Safety Review Update Report are to be submitted with desktop publishing quality colour covers and titles bound for each dam as well as digitally.

A draft of the report is to be forwarded to QC for review. The consultant will give a presentation to QC and answer questions. The final report will be prepared after written comments from QC are satisfactorily addressed.

The content of the report shall include information contained in the interim reports identified above and shall also include:

- site location plan(s)
- site layout plan(s)
- structural drawings
- construction and maintenance records
- operating rule curve
- stage-storage and stage-discharge curves
- watershed map showing the dam sites, drainage areas (local and total), hydraulic characteristics, hydro-meteorologic gauge stations
- historical flood flows and water levels
- input from operating staff
- review of design, construction, and maintenance records
- site inspections of dams and appurtenant structures
- destructive and nondestructive tests, underwater inspections, dye tests, and other test results
- design loading conditions, including uplift, ice pressure, etc, and stability analysis

- dam hazard classification
- flood frequency flows, probable maximum flood, and IDF
- flood routing model
- review of operating procedures, records, and test equipment required to operate discharge facilities
- adequacy of discharge facilities to pass the IDF
- dam break analysis and inundation mapping (if required)
- risk-based assessment (if applicable)
- assessment of structural condition and stability of the dam, including foundation conditions
- dam monitoring instrumentation
- adequacy of dam surveillance and monitoring programs
- recommendations for follow-up actions, priorities, and costs
- Public Safety Assessment (under a separate cover)
- Public Safety Plan (if required).

Meetings

Meetings shall be held with QC at key points throughout the study. A start-up meeting will be required to confirm the study methodology, schedule, etc. A meeting will be required at the end of the study to present the draft Dam Safety Review Report and answer questions.

The consultant will be responsible for recording minutes of all meetings and distributing to QC in a timely fashion.

All meetings will be at a mutually agreed location (i.e. at the conservation authority office, dam site or at the consultant's office). The consultant will provide adequate meeting facilities and equipment if it is decided that the meeting is to be held at the offices of the consultant.

Schedule

The final draft must be completed November 30, 2021. The consultant shall submit with their proposal(s) a schedule demonstrating their ability to complete the project in a timely fashion.

Proposal Submission Requirements

Proposals shall be submitted no later than 12 pm on Wednesday, July 21, 2021. Proposals can be submitted to Mike Smith at msmith@quinteconservation.ca or deliver two (2) copies to:

Quinte Conservation
2061 Old Highway 2
RR2, Belleville, ON
K8N 4Z2
Attention: Mike Smith

The proposal shall provide details on the approach and methodology, and include:

- Details on the approach and methodology
- contact person and phone number and people involved in the preparation of the proposal
- Gantt chart schedule showing activities, meetings, report submissions, etc.
- a list of key staff, their related experience in Ontario and role on this project
- corporate experience on similar projects in Ontario and elsewhere
- sub-consultants to be used, their role, corporate experience in Ontario, key personnel, per diem rates and the mark-up rate to be used
- estimated project cost for each study component
- project consulting fee to be used as a ceiling (upset) limit. The mark-up and calculation method shall be clearly described
- attestation of all addenda reviewed
- state all assumptions used
- Proposals shall not exceed 12 pages in length.
-
- Request for proposal issued Monday, July 5, 2021
- Questions regarding the proposal due Wednesday, July 14, 2021 at 12pm
- RFP addenda posted on the Quinte Conservation website Friday, July 16, 2021
- Request for proposal closing Wednesday, July 21, 2021 at 12pm

Selection Criteria

QC will select the successful consultant based on an assessment of the submitted proposals based on criteria such as meeting the project requirements, project team experience, and project cost. The proposal with the lowest bid may not necessarily be accepted.

Appendix A: Photos of Dam



Picture 1: Top of Dam Facing Downstream



Picture 2: Dam Facing Upstream



Picture 3: Location of Former Embankment Facing Downstream



Picture 4: Dam Facing Upstream.

Appendix B: Location of Dam

