

Section I – Items for Board of Directors Action

TO: Chair and Members of the Board of Directors
Meeting #2/19, Friday, February 22, 2019

FROM: Nick Saccone, Senior Director, Restoration and Infrastructure

RE: **REQUEST FOR PROPOSAL FOR DON RIVER FLOODPLAIN MAPPING
UPDATE AND G. ROSS LORD DAM GATE OPERATION RULE
OPTIMIZATION AND RISK STUDY**
RFP No. 10009146

KEY ISSUE

Award of Request for Proposal (RFP) No. 10009146 for engineering consulting services to update the Don River floodplain mapping and to investigate G. Ross Lord Dam's gate operation rules in order to reduce the risk of flooding along the West Don River.

RECOMMENDATION

WHEREAS Toronto and Region Conservation Authority (TRCA) is engaged in a project that requires engineering consulting services;

AND WHEREAS TRCA solicited proposals through a publicly advertised process and evaluated the proposals based on the criteria;

THEREFORE LET IT BE RESOLVED THAT Request for Proposal (RFP) No. 10009146 for the Don River Floodplain Mapping Update and G. Ross Lord Dam Gate Operation Rule Optimization and Risk Study be awarded to KGS Group Inc. at a total cost not to exceed \$169,775, plus applicable taxes to be expended as authorized by Toronto and Region Conservation Authority (TRCA) staff;

THAT TRCA staff be authorized to approve additional expenditures to a maximum of \$33,955 (20% of the project cost), plus applicable taxes, in excess of the contract cost as a contingency allowance if deemed necessary;

THAT should TRCA staff be unable to negotiate a contract with the above-mentioned proponent, staff be authorized to enter into and conclude contract negotiations with other Proponents that submitted proposals, beginning with the next highest ranked proposal meeting TRCA specifications;

AND FURTHER THAT authorized TRCA officials be directed to take whatever action may be required to implement the contract, including the obtaining of necessary approvals and the signing and execution of any documents.

BACKGROUND

TRCA, through the Conservation Authorities Act, has the mandate of reducing risk to life and property from flooding. Examples of undertakings that TRCA employs to achieve this mandate include regulating development, operating flood control infrastructure such as dams, channels and dykes and administering a flood forecasting and warning program.

Item 8.3

The objective of this project is to update floodplain modeling and mapping for the Don River Watershed in the City of Toronto and to enhance the operating procedures of the G. Ross Lord Dam utilizing new climate information, updated hydrology modeling and new state of the art modeling tools. This project is in line with TRCA's Strategic Plan, specifically Strategy 2; manage our regional water resources for current and future generations and is comprised of two phases of work. The first phase of work will focus on updating floodplain mapping for the Don River Watershed and the second phase of work involves investigating the operating rules for the G. Ross Lord Dam to see if there is a more effective way of reducing flood risk by controlling flows from thunderstorm events and maintaining dam safety for extreme flood events. By splitting this project into two phases, efficiencies in project management costs will be realized and the development of the hydrologic and hydraulic models can be designed simultaneously for both the floodplain mapping component and the optimization of the dam.

Phase I

TRCA has identified the need to update the hydraulic modelling and floodplain mapping for the Don River watershed in the City of Toronto. The update is required for two reasons. The first is that TRCA considers it best practice to update hydraulic models and floodplain mapping every 10-15 years. The existing mapping for the Don River was developed between 1977 and 2008. Secondly, new hydrology data and digital mapping tools are available. The Don River Hydrology Update, completed in 2018, established new Regulatory storm flow values using the most up to date land use, meteorological and stream flow monitoring information. Additionally, TRCA has recently acquired new LiDAR topographic mapping information that will allow for the development of precise floodplain contours to delineate areas at risk.

The study area includes all watercourses within the Don River watershed south of Steeles Avenue. Approximately 38 floodplain map sheets will be updated and stamped by a professional engineer licensed to practice in Ontario. The project will involve developing a sub-watershed scale hydraulic model utilizing the HEC-RAS (Hydrologic Engineering Center River Analysis System) hydraulic modelling platform to determine flood elevation estimates for the 2 through 350 year and Regional design storms throughout the Don River watershed in the City of Toronto. HEC-RAS is well suited for this assignment as it is the industry standard for hydraulic modeling of river systems and is used broadly across Ontario. Once completed, the model will be used to update TRCA's floodplain mapping, flood forecasting and warning systems and flood emergency response plans.

Phase II

G. Ross Lord Dam was constructed in 1973 on the West Don River to provide flood protection for downstream communities. The primary objective of G. Ross Lord Dam is to protect the community of Hoggs Hollow near Yonge Street and Wilson Avenue. The dam is located at 700 Finch Avenue West, east of Dufferin Street in the City of Toronto.

The dam is approximately 20m high and 350m long. It consists of a zoned earthen embankment with two concrete control structures. The first structure has two low level sluice gates (2mx2m) for small flows that are referred to as the low level gates. The second structure, referred to as the emergency gates, consists of two radial arm gates (10.3mx8.7m) for passing large flows. The dam was designed strictly for flood control and therefore the reservoir is maintained at a low level to create storage for flood events. The dam has a normal reservoir level of 172.3 MASL (metres above sea level) which corresponds to a storage capacity of approximately 400,000m³. The maximum level of the reservoir is 181.4 MASL which corresponds to approximately 5,500,000m³ of storage and has a crest elevation of 183.0 MASL.

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The G. Ross Lord Dam has a Hazard Potential Classification of 'Very High' as defined in the Classification and Inflow Design Flood Criteria Technical Bulletin under the Lakes and Rivers Improvement Act (LRIA) that is administered by the Ministry of Natural Resources and Forestry (MNRF). A Dam Safety Review in 2013 determined that a dam failure under extreme flood conditions would put approximately 3,000 persons at risk and cause approximately \$1.03 billion in property damage.

G. Ross Lord Dam has an Operations, Maintenance and Surveillance manual (OMS) that contains the operational rules for opening gates during storm events. The operational rules are based on the reservoir's rate of rise measured every 15 minutes. TRCA's current understanding of the operational rules is that they were developed primarily for large, long duration hurricane events with the objective of maximizing storage while preventing the dam from overtopping. The closer the reservoir is to the maximum operating reservoir level the smaller the rate of rise threshold for operating the gates.

The original 1975 OMS manual developed when the dam was constructed has a different operation regime than the current OMS. The 1975 OMS is vague regarding how gates are operated and it relied on an unspecified flood forecasting system. In 1982, TRCA initiated a study to develop specific criteria for operating the dam's gates which has been part of the OMS manual ever since. In 2008, TRCA undertook another review of G. Ross Lord Dam's OMS manual and operating rules. The results of the study recommended not changing gate operations; however, the study did not look specifically at optimization for thunderstorms.

TRCA's Engineering Services flood management staff are concerned that during high intensity, short duration thunderstorm events (such as the July 8, 2013 flood event), the rate of rise threshold could be reached and may cause flooding downstream without utilizing all the available storage in the reservoir under the current operating procedure. The primary objective of Phase II is to investigate the operating rules for the dam to see if there is a more effective way of reducing flood risk by controlling flows from thunderstorm events and maintaining dam safety for extreme flood events. Any new operations developed during this study will be incorporated into the OMS manual.

RATIONALE

RFP documentation was posted on the public procurement website www.biddingo.com on October 24, 2018 and closed on December 4, 2018. Five (5) addendums were issued to respond to questions received. A total of twenty-seven (27) firms downloaded the documents and six (6) proposals were received from the following Proponents:

- AECOM;
- AHYDTECH Geomorphic;
- Aquafor Beech Ltd.;
- Cole Engineering Group Ltd.;
- Golder Associates Inc.; and
- KGS Group Inc.

The proposal from AHYDTECH Geomorphic was disqualified because it was received after the deadline of 12:00pm on December 4th, 2018.

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An Evaluation Committee comprised of staff from Engineering Services reviewed the proposals. The criteria used to evaluate and select the recommended Proponent included the following:

Criteria	Weight
Experience and Qualifications	20
Understanding of the Work	20
Proposed methodology	30
Proposed schedule	10
Sub-Total	80
Pricing	20
Sub-Total	20
Total Points	100

KGS Group Inc. was the lowest bidder and achieved the highest overall score based on the evaluation criteria. Therefore, it is recommended that contract No. 10009146 be awarded to KGS Group Inc. at a total cost not to exceed \$169,775, plus 20% contingency, plus applicable taxes, it being the highest ranked Proponent meeting TRCA specifications. Proponent's scores and staff analysis of the evaluation results can be provided in an in-camera presentation, upon request.

Relationship to Building the Living City, TRCA's 2013-2022 Strategic Plan

This report supports the following strategic priorities set forth in TRCA's Strategic Plan:

Strategy 7 – Build partnerships and new business models

Strategy 2 – Manage our regional water resources for current and future generations

FINANCIAL DETAILS

TRCA is funding 50% of this project through 107-03 (Dam and Flood Control Facilities Capital Works) and 107-37 (Don River Floodplain Mapping Update). The remaining 50% is being funded through a grant from the Federal National Disaster Mitigation Program (NDMP).

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