REQUEST FOR PROPOSAL/ TERMS of REFERENCE

FOR

CONSULTANT SERVICES TO COMPLETE

NBMCA RFP 22-01

LA VASE RIVER
FLOODPLAIN MAPPING PROJECT

February 22, 2022

Deadline for submissions:
March 14, 2022 at 4:00 p.m. E.S.T.

Table of Contents

List of Appendices

List of Maps

1 Introduction

The North Bay-Mattawa Conservation Authority (NBMCA) is undergoing the process of updating its floodplain mapping, which was completed during the 1980's. The next subwatershed to be updated is the La Vase River subwatershed (as shown on Map M-1: Area to Complete Flood Line Mapping), with the remaining subwatersheds updated in subsequent years, funding permitting.

Topographic data is an essential component of hydraulic modelling to determine areas of flood inundation. The accuracy of which is important as it is the key determining factor in modelling extents of the floodplain. The regulatory floodplain is used by NBMCA during the administration of Ontario Regulation 177/06. The services to be performed by the Consultant for updating the floodplain mapping of the La Vase River shall adhere to these Terms of Reference, except as amended in writing by NBMCA.

2 Background Information

The La Vase River subwatershed is a low relief poorly drained basin that originates in East Ferris and drains west through southern North Bay before its outlet into Lake Nipissing. The entire La Vase River basin has limited overburden and poorly developed soils. The 90.76 km^2 watershed is located in the Mattawa lowlands and has low water yield and extreme variations in flows. The upper La Vase is modestly undulating with upland remaining predominantly forested and low areas, which have historically been farmed, remaining as fields. The central watershed remains largely undeveloped, and is dominated by bedrock outcrops surrounded by wetlands, including an evaluated provincially significant wetland near Dreany Lake. Shallow bedrock quarrying has occurred in some areas. The lower La Vase supports limited rural residential uses and patches of urbanization, including several commercial/industrial areas.

The lower reaches of the La Vase River are subject to back flooding from Lake Nipissing. The mouth and lower La Vase River once served as a popular boat launch/docking area with extensive motorized watercraft usage. Boat wakes significantly altered the river's morphology from a narrow, deep river, to a shallower, wider river with reduced navigability. NBMCA has addressed stream bank erosion by undertaking stream bank stabilization work in some areas, and boat usage along the river has declined with the development of the North Bay waterfront.

The La Vase River watershed is well known for its historical significance. Nipissing Junction, a location where a significant canoe route, railways, and a

major highway all intersect attests to the importance the La Vase system has played to continental transportation. As well as the use of the La Vase River as a historical canoe route, the La Vase River provided a convenient corridor for the development of the CPR continental railway line and the La Vase River mouth was the site of Fort or "House La Ronde", the first building in North Bay.

There is a Water Survey of Canada gauging station (Station No. 02DD013) located on the La Vase River that has active flow records since 1974.

NBMCA received 2011 COOP orthophotography in 10cm resolution for the City of North Bay including the La Vase River subwatershed. From this PCI Geomatica generated a high resolution 1:2000 Digital Elevation Model (DEM). In 2016 NBMCA acquired COOP orthophotography covering the entire City of North Bay with ground resolution equal to 20 centimetres, which was developed into a DEM using orthophotogrammetry techniques. NBMCA has completed 1:2000 hydrological feature mapping/large scale hydrology for the La Vase River subwatershed. In 2018 Sumac Geomatics Inc. provided high-quality mapping of wetlands for NBMCA's area of jurisdiction, including the La Vase River subwatershed. In 2019 KBM Resources Group provided LiDAR data covering the City of North Bay urban area, including a portion of the La Vase River subwatershed. The LiDAR has a tested 20cm fundamental vertical accuracy at a 95 percent confidence level. The extent of the LiDAR data is shown on the attached map M-2: LiDAR Extents.

In addition to the above, the Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF) Provincial Mapping Unit has recently (available as of January 31, 2022) collected LiDAR data for the Nipissing area, including the La Vase River watershed, and generated several elevation models including a bare-earth Digital Terrain Model (DTM). The DTM has been licensed as Open Data and is therefore available for use in this study, more details can be found on the Ontario GeoHub website: https://geohub.lio.gov.on.ca/maps/mnrf::ontario-digital-terrain-model-lidar-derived/about.

3 Objectives

The Consultant is to provide technical and engineering services to update the existing floodplain mapping of the La Vase River in the City of North Bay. The work will entail the following key components:

i. To review the available elevation data (i.e NBMCA LiDAR, COOP 2011 DEM, and MNDMNRF LiDAR) and determine the most appropriate elevation dataset to be used for the study. The highest accuracy elevation surface available for an area should be used to delineate the floodplain, which NBMCA anticipates will be either the NBMCA LiDAR or the MNDMNRF LiDAR data, or a combination of the two.

ii. To delineate the subwatersheds of the La Vase River, using the LiDAR and DEM.

iii. To complete hydrologic modelling of the La Vase River subwatershed to determine peak flows for the design storms, including the 1:2, 1:5, 1:10, 1:25, 1:50, 1:100 and Timmins Events.

iv. To extract cross-sections along La Vase River from the LiDAR and DEM and apply the cross-sectional data to determine the water surface profile under various design floods using HEC-RAS, and to provide accurate floodplain mapping to determine areas of potential inundation.

v. Details with respect to all channel crossings including grades, slopes, invert elevations, condition, material type, and dimensions shall be surveyed and/or confirmed in the field by the successful bidder and shall be georeferenced.

vi. To determine if 2D hydraulic modelling is necessary and/or value added in any portion of the floodplain and to complete the 2D hydraulic modelling.

vii. To illustrate, present, document and store the digital data of the computed floodlines and maps using the tools and extensions provided by ArcGIS and/or HEC-RAS.

viii. Internal project meetings and public meetings as discussed below.

4 Scope of Services

Prior to initiating the project, the Consultant will meet with NBMCA and become oriented and familiar with the project. A general work flow of the services provided by the Consultant involves creating the hydrologic model, and producing the hydraulic model from the elevation model data. The hydrologic and hydraulic engineering models are run, and the outputs of these models are then combined with the elevation models to produce floodline maps in both paper format and ArcGIS format.

Specifically, the Consultant is expected to provide the services to NBMCA as set out below. References are made by these Terms of Reference to several specifications recognized by the engineering community. If there are any inconsistencies among the specifications, the requirements specified in these Terms of Reference prevail.

4.1 Project Area

The watershed boundary for the La Vase River subwatershed is shown on Map M-1: Area to Complete Flood Line Mapping. Please note that the delineated subwatersheds are approximate, and the final subwatershed boundary should be confirmed by the Consultant using the LiDAR and DEM. The floodlines for the La Vase River will be calculated and mapped for the entire subwatershed area.

4.2 Hydrologic and Hydraulic Modelling

The peak flow hydrologic modelling is required for all return period flows and the Timmins storm, preferably using HEC-HMS. The hydraulic modelling on the peak flows is to be carried out using HEC-RAS. Consideration of the necessity of 2D modelling in applicable areas is to be assessed. The hydrologic and hydraulic modelling and the preparation of the reports are to be carried out in accordance to the requirements specified in Appendix A.

The cross-sections above waterline obtained from the LiDAR and DEM are to be supplemented with cross-sectional information below waterline obtained by field survey. The river channel elevations below waterline, the cross-sections immediately upstream and downstream of bridges and culverts or where there is a significant change in conveyance are to be obtained by field survey. The field survey cross-sections must be carried to those points that represent significant breaks in ground slope and at changes in the hydraulic characteristics of the floodplain that can be identified by LiDAR and DEM information.

4.3 Specific Analysis Required

The consultant must also provide the following analysis which must be included in one of the reports and/or mapping products.

i. The return period flow and the corresponding water level must be provided for the 2, 5, 10, 25, 50, 100 and Regional Storm flow.

ii. Tables must be included in the report that summarizes the overtopped structures and flooded buildings in the watershed. Maps and summary tables must be prepared for the 2, 5, 10, 25, 50, 100 and Regional Events, which outline the location of all flooded structures (i.e. culverts and bridges) and buildings (i.e. dwellings, garages, etc.), including but not limited to the structure ID, location description, river station, water depth, flow velocity and depth x velocity with their comparison to the life safety criteria (depth = > 0.3 metres, velocity = > 1.7 metres/second, and depth x velocity = > 0.4 metres^2/second).

4.4 Mapping

The flood maps will be used by NBMCA during the administration of Ontario Regulation 177/06 and they are to be prepared in accordance to the Ontario *Guidelines for Developing Schedules of Regulated Areas*, dated October 2005. The development of the mapping products in both paper format and digital format and the preparation of the project General Report are to be carried out in accordance to the requirements specified in Appendix A attached to these Terms of Reference.

5 Meetings

The Consultant is to allow for a minimum of four formal meetings and participation in the Open House to be held at the office of NBMCA. The purpose of the meetings and their approximate schedule are as follows:

i. Orientation meeting after the award of assignment but before initiating the project (March 2022)

ii. Meeting to present the results of hydrologic modelling and submit the draft Hydrology Report (Summer 2022)

iii. Meeting to present the results of hydraulic modelling, the draft floodplain mapping, and submit the draft Hydraulic Report (Fall 2022)

iv. Meeting to present the final mapping products in both paper and digital format, submit the final Hydrologic and Hydraulic Reports, and submit the draft General Report (Late Fall 2022)

v. Prepare and present the project outline and results during a public Open House and before the public Open House to the City of North Bay, NBMCA staff and Board of Directors, and other public agencies. A minimum of two consultants who were part of the project team must be present during the Open House to answer any questions related to the study. (Winter 2022)

6 Project Schedule

The following table represents various works associated with the project. The time frame for completion of the project has been established as Winter 2022. This schedule will require dedicated commitment by the Consultant at all stages of the project. The NBMCA reserves the right to award all or selected phases of the project.s

The NBMCA requires the successful Consultant to provide a project schedule that satisfies the milestone dates noted below. The schedule is to be submitted for review and comment by NBMCA at the project start-up and shall be updated biweekly with an electronic copy forwarded to NBMCA. The NBMCA reserves the right to advance or revise the timing of the project phases.

Project Phases	Work Item / Milestone	Milestone Date
	Award of the project assignment by NBMCA	March 2022
1	Hydrologic analysis and modelling, and the Hydrology Report	July 2022
2	Hydraulic analysis and modelling, draft floodplain mapping, and the Hydraulic Report	September 2022
3	General Report and final mapping products in paper and GIS format	October 2022
4	Open House	December 2022

7 Deliverables

The deliverables under the project are generally summarized as follows, but the comprehensive requirements of the deliverables are specified in Appendix A. All data collected and mapping materials produced under this project are the property of North Bay-Mattawa Conservation Authority.

i. Hydrology, Hydraulics, and Reporting

Hydrology Report
- 4 hard copies of draft report
- 4 hard copies of final report
- Electronic copy of final report

Hydraulic Report
- 4 hard copies of draft report
- 4 hard copies of final report
- Electronic copy of final report

General Report
- 4 hard copies of draft report
- 4 hard copies of final report
- Electronic copy of final report

- Hydrology modelling input and output data in digital format

- HEC-GeoRAS and HEC-RAS input and output in digital format

- Power Point Presentation outlining reports presented at Open House

ii. Floodplain mapping products in both map sheets and ESRI file format
- Draft floodplain mapping – 1 hard set and a digital set
- Final floodplain mapping sealed by a P. Eng. – 2 hard sets + digital set
- Floodplain mapping products in ESRI file format

iii. Public Open House

The consultant will be required to prepare and present a PowerPoint presentation at both a municipal/NBMCA session and to the public at an Open House to present the findings of the reports and answer any questions. A minimum of two consultant staff must be present during the Open House to answer any questions from the public.

8 Information Provided by NBMCA

The NBMCA acquired orthophotogrammetry in 2011 and 2016, and acquired LiDAR for a portion of the La Vase River subwatershed in 2019. The 2011 and 2016 DEMs developed from the orthophotogrammetry, as well as the 2019 LiDAR, will be available to the Consultant to develop the background imagery for the floodplain mapping. Modification to the maps may be necessary in order that they will conform to the floodplain mapping requirements specified these Terms of Reference.

The NBMCA 2011 orthophotogrammetry has the following specifications:

- Ground resolution = 10 cm
- Spatial Reference = North American 1983 CSRS UTM Zone 17N
- Vertical Datum = CGVD28
- Units = metres

The NBMCA 2019 LiDAR has the following specifications:

- Spatial Reference = NAD83(CSRS), Epoch 2010.00, UTM Zone 17N
- Vertical Datum = CGVD2013
- Units = metres

The MNDMNRF 2022 LiDAR has the following specifications (please refer to https://geohub.lio.gov.on.ca/maps/mnrf::ontario-digital-terrain-model-lidar-derived/about for the User Guide containing the complete specifications):

- Spatial Reference = NAD83(CSRS), Epoch 2010.00, UTM Zone 17N
- Vertical Datum = CGVD2013
- Units = metres

NBMCA will provide to the Consultant a copy of:

- *La Vase River Report*, June 1976 – Response to Review Committee Comments
- *La Vase River Flood Hazard Study*, Blake F. Dawdy, February 1988
- *La Vase River Flood Hazards & Floodway*, Blake F. Dawdy, October 1988
- Letter re. *La Vase River Flood Hazards & Floodway*, Blake F. Dawdy, June 1992
- *La Vase River Watershed Inventory Document Final Report*, Provincial Environmental Youth Corps, March 1997
- *La Vase River Watershed Management Study*, Totten Sims Hubicki Associates, October 1997
- *Floodline Mapping Study - La Vase River and Tributary at Corbeil*, Totten Sims Hubicki Associates, January 1998
- *Aerial Acquisition of LiDAR*, KBM Resources Group, January 2019 – Collection of NBMCA LiDAR data

- Available historical and/or existing floodplain mapping for the La Vase River
- Where available, the OTTHYMO and HEC-2 inputs and outputs will be provided.

In addition, the following digital information for the La Vase River will be provided to the Consultant in ESRI shapefile format for use in the project:

- A map showing watershed and subwatershed boundaries
- Hydrologic features such as stream, lakes, shorelines, etc.
- Existing floodplain mapping information

The Land Information Ontario (LIO) data sets are to be used by the project and the Consultant may need to be a member of Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF) LIO. The Consultant will need to obtain Data Sharing Agreement with NBMCA, the City of North Bay, MNDMNRF and any other source of data required to complete the project.

9 Inquiries

Any inquiries relating to these Terms of References should be directed to Kurtis Romanchuk, Water Resources Engineer, at kurtis.romanchuk@nbmca.ca. Verbal clarification should not be interpreted as changes to the intent of these Terms of Reference. Any revisions to these Terms of Reference will be issued in writing.

10 Proposal Submission Requirements

All proposals shall be evaluated based on the suggested methodology and work program, the company experience, staff experience, technical knowledge and experience, and cost. The NBMCA reserves the right to reject any or all proposals should it be deemed in their best interest to do so. A complete proposal should include the following information:

i. Knowledge and understanding of the scope and the requirements of the project.

ii. A clearly articulated, detailed description of the approach and methodology to ensure that the deliverables are acquired, processed, developed and submitted according to the timing and accuracies identified in these Terms of Reference, including a detailed work plan outlining tasks, timelines, milestones and schedules of all deliverables.

iii. A brief description illustrating the capability, capacity and resources of the project team to acquire, process, manage and deliver the deliverables identified in these Terms of Reference.

iv. An organization chart indicating how the Consultant intends to structure its working relationship with NBMCA.

v. The roles and responsibilities of any sub-Consultants and employees who will be involved in providing the services, together with the identity and their relevant respective expertise and experience.

vi. Provide references for and a description of the similar services provided to past similar projects with an emphasis on experience relevant to the process and deliverables for this project. Similar information should be provided for any sub-Consultants that are part of the study team. The proposal must include a list of sub-consultants who will be involved in the project and providing the deliverables.

vii. Description of any value added or innovative techniques that are proposed.

viii. A cost breakdown with per diem and project component costs as well as total cost for completing each of the following phases of the project for the La Vase River subwatersheds:
    a. Completion of topographic data acquisition (i.e. supplemental field surveys) and data processing, all deliverables
    b. Completion of hydrology analysis and modelling and the Hydrology Report
    c. Completion of hydraulic analysis and modelling and Hydraulic Report
    d. Completion of flood line mapping, including mapping products in paper format and GIS format

The Consultant must include the completed Fee Proposal Summary Form attached to these Terms of Reference. The NBMCA reserves the right to complete all phases or selected phase/phases of the project.

If the Consultant feels it is advisable to do additional work, or delete some work specified, the cost of these additions or deletions should be separately identified.

Three copies of the proposal, clearly marked "Proposal for the updating of the La Vase River Floodplain Mapping Project" **must be received by NBMCA no later than 4:00 p.m. EST on March 14th, 2022** at:

North Bay-Mattawa Conservation Authority
15 Janey Avenue, 2nd Floor
North Bay, ON P1C 1N1

Due to the COVID-19 pandemic, a drop box is located on the 2nd floor of 15 Janey Avenue outside the NBMCA office door to receive the proposals. Masks or other appropriate face covering are required to be worn while inside the building.

Proposals will be reviewed by a committee. Following their review a recommendation for award will be made to the Board of NBMCA.

11 Proposal Evaluation Criteria

Proposals will be evaluated using a best value approach considering both merit and price. The Selection Committee will score each of the components of the following evaluation table:

Stage 1 – Mandatory Requirements:	
Compliant Mandatory and Submission Requirements – Section 10	Pass/Fail
Stage 2 – Proposal Merits	
Proponent Qualifications – based on criteria requested under section 4	25
Technical – based on criteria requested under section 7	25
Stage 3 –Financial	
Total Price: scores for the cost criterion will be calculated as follows: The lowest cost Proposal receives 60 points; The remaining Proposals are assigned points based on the formula: (lowest cost proposal / Proponent's proposal cost x 60)	50
Total Available Points	100

If the Proposal does not meet the requirements of Stage 1 - Mandatory Requirements, the Proposal will be rejected.

Each of the components in Stage 2 - Proposal Merits is evaluated and assigned a rating between 0% and 100%. The Selection Committee will rate each component on the basis of consensus. The rating percentage is then used to

calculate a score based on the points allocated to that component. The following table outlines the key rating percentages:

Key Rating %	Characteristics	
0%	Unacceptable	Does not meet any of the requirements.
30%	Poor	Does not meet the all of the basic requirements.
60%	Fair	Meets the very basic requirements only. Minimally acceptable.
75%	Good	Meets all key requirements. An acceptable standard.
90%	Very Good	Meets all requirements and all expectations.
100%	Excellent	Exceeds the requirements. Provides additional benefit.

Example: If a component is evaluated as better than “Very Good” and rated at 95% and 30 points are allocated, the score for the component will be 0.95 x 30 = 28.5 points.

The Proponent must score a minimum of 60% of the available points in Stage 2 - Proposal Merits, to be further considered and evaluated for the Financial component of the Proposal.

The Proposal that achieves the highest total score will be ranked first. In the event of a tie total score, the Proponent with the lowest cost will be ranked first overall.

12 Proposal Form

Request for Proposal
For
Engineering Services to Complete
The La Vase River Floodplain Mapping Project

Item No.	Item Description	Amount
1	Four (4) meetings at the NBMCA office	$
2	Presentation and attendance at Open House	$
3	Completion of topographic data acquisition and data processing, all deliverables	$
4	Completion of hydrology analysis and modelling and Hydrology Report	$
5	Completion of hydraulic analysis and modelling and Hydraulic Report	$
5 a)	OPTION: If necessary in any floodplain areas, completion of 2D hydraulic analysis and modelling and 2D Hydraulic Report	$
6	Completion of flood line mapping, including mapping products in paper format and GIS format, and the General Report	$
		$
	Sub-Total	**$**
	HST	**$**
	Total	**$**

Authorization

The Consultant must submit a signed hardcopy of their proposal including this Request for Proposals with the following section completed and delivered to:

North Bay-Mattawa Conservation Authority

Attn: Kurtis Romanchuk, Water Resources Engineer

15 Janey Avenue, 2nd Floor

North Bay, ON P1C 1N1

By: 4:00 pm E.S.T., March 14th, 2022

Submitted By: _____

Company Name: _____

Address: _____

Phone Number: _____

Principle Representative: _____

Signature of Principle: _____

Date: _____

Please list the content of the submission (Number of pages, CD, etc.)

_____

_____

_____

_____

Appendix A: Hydrology, Hydraulics, Mapping and General Report

1 Hydrology

1.1 Computational Method

Unless otherwise specified, flood flows must be determined for the Regional Storm, 100, 50, 25, 10, 5 and 2 year return period floods for both existing and future conditions. The Regional Storm flood flow must be determined using a hydrologic model approved by the North Bay-Mattawa Conservation Authority (NBMCA). The preferred hydrologic modelling software is HEC-HMS. Other models may be acceptable but must receive written approval from the NBMCA prior to the execution of the contract agreement for the project. The methodology used in determining watershed parameters and the design flows for hydraulic analysis are to be discussed in the report.

1.2 Rainfall Events

Unless otherwise specified, the Timmins Storm is the Regional Storm to be used to calculate the design flow for determining the flood hazard line. The equivalent circular area method shall be used to compute the area rainfall reduction factors for the Timmins Storm for all watersheds except for those having an extremely elongated shape, for which isohyetal method shall be used. The precipitation frequency or, where snowmelt floods are significant, a combination of snowmelt and precipitation can be used to calculate the return period floods if meaningful gauge stations are not available for use.

1.3 Frequency Analysis

The 100, 50, 25, 10, 5, and 2 year floods shall be determined by single station frequency analysis or by regional flood frequency analysis or by precipitation frequency analysis if there are no meaningful gauging stations available for use. Single station frequency analysis shall be carried out when the length of record is equal or greater than 20 years. Frequency analysis may be carried out using the Consolidated Frequency Analysis computer program (CFA1), developed by Environment Canada. Other models may be substituted only when prior written approval is received from the NBMCA. It is expected that the return period flood flows determined from fitting the data to the Lognormal Distribution or Log Pearson III Distribution are to be used for hydraulic analysis, however, should the results of hydrology analysis indicate otherwise, the Consultant shall inform the NBMCA.

In watersheds for which the required parameters of the regional frequency relationships fall outside the range of applicability of the regression equations, the 100, 50, 25, 10, 5, and 2 year floods shall be determined using a calibrated hydrological model. The model shall be based on precipitation frequency or, where snowmelt floods are significant, a combination of snowmelt and precipitation. The flows generated by the model must be substantiated through comparison with other analyses.

1.4 Drainage Area

The Consultant must determine the watershed contributing drainage area through the use of topographic maps. Ineffective areas such as large gravel pits which do not contribute to surface runoff should be excluded in the evaluation of flood flows. The Consultant shall carefully consider discretization of the watershed, separating major tributary areas, and review soils and land use data to understand their influence on runoff.

1.5 Land Use

The time of projection into the future land use conditions is expected to follow the new City Official Plan which indicates designated future development areas in the La Vase River watershed. An assessment of the impact of the future land use on the return period flows must be carried out using a calibrated hydrologic model and fully documented in the hydrology report. The calibrated hydrologic model or other acceptable procedure should be used to determine flows at ungauged locations and must be discussed in detail in the hydrology report.

1.6 Reservoir Routing

Reservoir routing shall be undertaken for dams and embankments, such as railway embankments and road fills that have sufficient storage effect. If failure of the structures may occur under flood conditions, consideration will be given to the effect on increasing the downstream peak flows. Reservoir routing shall also be undertaken for instream lakes and wetlands that have a significant storage effect.

1.7 Channel Routing

If the river has such a significant storage effect, the hydrologic model should include a routing method to account for the effects of channel storage. Rating curves and travel times used in channel routing shall be determined by preliminary hydraulic calculations of the backwater profile or

by procedures available in the approved hydrologic model. The length of the reaches and routing time increment shall be in accordance with the criteria established by the generally accepted engineering principles. Cross-sections required for the hydrologic model routing procedure can be obtained from the elevation DEM produced under this project.

1.8 Calibration

Calibration and validation of hydrologic model shall be undertaken using all available streamflow records. At least three significant events (minimum 25 mm runoff) shall be used at the calibration stage. The Consultant must carefully examine the records and gauges in order to determine their accuracy and suitability for calibration and subsequent validation. If there are no suitable records, parameters used in the model must be supported by calibration and testing on a similar adjacent watershed. In either situation, the Consultant must carry out sensitivity analyses to determine the impact of changing model parameters and degree of discretization of the watershed on calculated flows. The flows generated by the calibrated model must be substantiated through comparison with other analyses such as regional frequency analysis, MTO Modified Index Flood Method or other approved methods deemed suitable and approved by the NBMCA. The Consultant shall report any calibration problems to the NBMCA. In order to determine future flows, the calibrated model parameters are to be adjusted accordingly.

1.9 Sensitivity Analysis

Carry out sensitivity analyses to determine the impact of changing model parameters and degree of discretization of the watershed on calculated flows. The results of sensitivity analysis are to be documented in the report.

1.10 Spills

The Consultant must identify and report to the NBMCA spill areas in the hydrologic phase of the project. Detailed analysis of spill quantities shall be undertaken during the hydraulic calculations and appropriate adjustments will be made to downstream flows based on the discussion and approval of the NBMCA.

1.11 Hydrology Technical Report

Prior to undertaking the hydraulic analysis to determine the water surface profiles, the Consultant must submit draft technical report and documentation of hydrologic study. The technical report is to be prepared in such a way that the work can be replicated by any qualified professional engineer without the need to refer to other material. Further, the qualified professional engineer is to be able to recognize and understand all the methods, approaches, assumptions, rationale and basic data used to carry out the hydrological study.

At the completion of the project, the Hydrology Technical Report, sealed by a professional engineer licensed to practice in Ontario, is to be submitted to the NBMCA.

Report Format

The Hydrology Technical Report will document the hydrologic analysis and it should be prepared in accordance to the following format:

- Summary of hydrological study
- Introduction
  - Objectives of the study
  - General description of watershed and the study area
  - History of flooding
  - General background information
  - Criteria used for floodplain
- Watershed drainage boundary, tributaries and their drainage boundaries, background information of the watershed and previous hydrologic studies of the watershed
- Source, availability and location of hydrometric data. Documentation of the streamflow and rainfall gauges and records to be used in the study
- Methodology used in determining watershed parameters and factors such as lakes, reservoirs, land use, etc. that influence surface runoff, the justification for the selected watershed parameters used in the study, and the hydrologic routing procedures.

- Review and document river crossings with significant storage effect

- Methodology and criteria used in determining design flows for existing and future conditions. The criteria used in the flood frequency analysis and the reasons for choosing a particular distribution.

- Hydrologic software and model used for the hydrologic study

- Calibration and validation of the hydrologic model
    - Data (observed hydrographs, rainfall records, spatial and temporal distributions of rainfall, antecedent moisture condition, etc.) used in calibration
    - The reasons for the choice of data used in the calibration
    - Calibration of model parameters
    - Justification of the values of the calibrated parameters
    - Sensitivity analysis
    - Validation of model

- Comparison of flows generated by the calibrated model with other analysis

- Magnitude of design flows for existing and future conditions

- Conclusions and Recommendations

- List of publications referred by the Hydrological Study

- Tables summarizing the following data and analyses
    - Available hydrologic and hydrometric data
    - Data used in calibration and the results of calibration
    - Calculated and calibrated watershed parameters for existing and future conditions
    - Regional storm flood flows
    - Streamflow data used in frequency analysis and the results of frequency analysis
    - Precipitation and snowmelt data used in calculation of return period flows
    - Comparison of flows by different methods for various return period flood flows
    - Magnitude of design flows for existing and future conditions
    - Results of sensitivity analysis

- The following maps and diagrams are to be included in the report:
  - A small topographic map showing the watershed and subwatershed boundaries and hydrometric stations
  - Hydrographs
  - Flood frequency curves including confidence limits
  - Existing and future land use plans

- Any other relevant diagrams and maps used in the hydrologic analysis.

- The following data and results of the analysis are to be included in the appendices of the report:
  - A large scale topographic map of the watershed showing the subwatersheds, overland flow and channel lengths used in time of concentration calculations, structures with significant storage
  - Plots of the stream, watershed and subwatersheds profiles
  - Calculations of various watershed parameters such as weighted slope, time of concentration, time to peak, recession constant, curve number, etc., and rainfall reduction factors and storage-outflow relationships.
  - Input data and output of the calibration and validation analysis
  - Input data and output of sensitivity analysis
  - Input data and output and summary output of hydrologic analysis
  - Input data and output and graphs of flood frequency analysis
  - Complete listing of the software used and the computer program source and executable modules and input data in digital format.
  - Other data relevant to the hydrological study

2 Hydraulic

2.1 Computational Method

Prior to undertaking hydraulic calculations, the Consultant must review and verify the existing information provided by the NBMCA, the LiDAR information and its derivatives products developed for the purpose of facilitating the hydraulic analysis and floodline mapping. Water surface profiles shall be computed using the most current version of HEC-RAS. The hydraulic model must be continuous from the upstream to the downstream limits. Collection and processing of data, computational procedure and analysis of computed profiles must meet criteria and guidelines published by the Hydrologic Engineering Centre HEC-RAS and HEC-GeoRAS User Manuals. The Consultant should justify the use of "non-standard" model options and such use must receive written approval from the NBMCA before executing the contract agreement to undertake this project.

Manning's roughness coefficients are to be based on appropriate values to suit riparian conditions as evident on aerial imagery. For natural vegetation, some consideration to future natural regeneration of the river and forest should be given when selecting Manning's values.

2.2 Cross Sections

Cross-sections are to be used for hydraulic analysis and they are to be cut from the TIN DEM produced for the project. The cross-sections above waterline obtained from the TIN DEM are to be supplemented with cross-sectional information below waterline obtained by field survey. The river channel elevations below waterline, the cross-sections immediately upstream and downstream of bridges and culverts or where there is a significant change in conveyance are to be obtained by field survey. The field survey cross-sections must be carried to those points that represent significant breaks in ground slope and at changes in the hydraulic characteristics of the floodplain that can be identified by LiDAR information. Along the reaches where there is little change in conveyance, fewer cross-sections may be needed. In conducting the hydraulic analysis using LiDAR information, the cross-sections should be more numerous and represent short reaches as the cross-sections can be easily cut from the TIN DEM, enabling the HEC-RAS model to be more truly representative of river channel reaches.

Cross-sections shall be located and spaced in accordance with the

criteria and guidelines published by the Hydrologic Engineering Centre HEC-RAS User Manual. Cross-sections are to be extended across the entire floodplain and perpendicular to the anticipated flow lines. Maximum spacing between successive cross-sections shall be dictated by the analytical requirements of the model and in no case shall result in more than 0.5 m difference in successive water surface elevations, unless approved by the NBMCA. Computer generated vertically extended or interpolated cross-sections are not acceptable. Any data void or artifacts of LiDAR data that may impact on the accuracy of the hydraulic model must be reported immediately to the NBMCA. Additional ground survey is required to cut cross-sections through the areas of data voids and artifacts that have a bearing on the hydraulic analysis. The benchmarks used by the ground survey are to be properly documented in the Hydraulic Technical Report and General Report.

All cross-sections are to be identified and coded looking downstream. The same numbering system for the cross-sections must be used in the field survey notes, HEC-RAS model, floodline maps and reports.

2.3 Bridges and Culverts

All existing structures, such as bridges, dams and embankments are to be photographed and those which will affect the floodline are to be field surveyed. An explanation must be provided for other structures which are not surveyed. The top of road profile must be obtained by field survey and extend across the entire width of the floodplain. The selection of the bridge routines and the discussion on the method used and assumptions made in the calculations of the backwater effects of the bridges and culverts are to be documented. The velocity and the depth of water overflowing roads are to be documented and summarized in the Hydraulic Technical Report. A dam break analysis using simplified approaches should be undertaken to determine the flood levels downstream of high embankments where failure under flood conditions may occur.

The survey information of dimensions and elevations of existing structures must be referenced to geodetic datum. Data sheets recording the dimensions, elevations, sketches and photographs of each structure are to be appended to the Hydraulic Technical Report.

2.4 Modelling Water Surface Profiles

Water surface profiles must be determined for the Timmins Storm and the 100, 50, 25, 10, 5, and 2 year floods for the existing and future land use

conditions using the latest version of HEC-RAS. The Consultant must calibrate the hydraulic model where data such as high water marks are available. Starting water surface elevations must be established based on the guidelines published by the Hydrologic Engineering Centre HEC-RAS User Manual. Where a lake is the control point, the starting water surface elevation shall be based on the long term mean lake level. The 100-year lake level is to be superimposed on the resultant water surface profile to establish the flood hazard line. Where a control starting elevation (such as a weir) is not possible, the starting section shall be located sufficiently downstream that the reach under consideration is not significantly affected by the starting elevations. The method used and the assumptions made in the determination of the starting water surface elevations for backwater computations are to be documented in the Hydraulic Technical Report.

The Consultant must carry out sensitivity analysis in accordance with Hydrologic Engineering Centre HEC-RAS User Manual to determine the effects of changing model parameters on the resulting flood levels. Floodlines upstream of structures with significant upstream storage will be based upon reservoir routing. An assessment of the sensitivity of culvert blockages on upstream flood levels must also be carried out for high embankments. A dam break analysis shall be undertaken to determine flood level downstream of high embankments where failure under flood conditions may occur.

A summary table listing depth and velocity of flows at the overtopped roads and flooded structures is to be prepared. The Consultant must assess whether safe access and egress are achievable using the specified flood criteria (i.e. depth =>0.3 metres, velocity =>1.7 metres/second, depth x velocity =>0.4 m^2 per second).

2.5 Spills

Spill areas may be identified as such only when the flow going out of the channel is significant in terms of downstream flows. The Consultant should investigate whether the spill is natural or as a result of manmade structures. If the spills are significant, their locations, causes, impacts, significance and recommendations are to be discussed separately in the report.

2.6 Hydraulic Technical Report

Prior to preparing floodline maps, the Consultant must submit a draft hydraulic report to document the hydraulic study. The hydraulic report is to be prepared in such a way that the work can be replicated by any qualified professional engineer without the need to refer to other material. Further the qualified professional engineer are to be able to recognize and understand all the methods, approaches, assumptions, rationale and basic data used to carry out the analysis.

At the completion of the project, the Hydraulic Technical Report, sealed by a professional engineer licensed to practice in Ontario, is to be submitted to the NBMCA.

Report Format

The Hydraulic Technical Report will document the hydraulic modelling and it should be prepared in accordance to the following format:

- Summary of Hydraulic Study.
- Introduction
  - Objectives of the study
  - General description of watershed and the study area
  - History of flooding
  - General background information
  - Criteria used for floodplain
- Background information and previous backwater analysis and study.
- Topography of area along the river and the floodplain.
- Field survey to obtain cross-section information to supplement LiDAR information, including proper documentation of the bench marks used.
- The types of floods and the associated design flows.
- Methodologies, assumptions and the software used for water surface profiles analysis.
- Method used and assumptions made in the determination of the starting water surface elevations for backwater computations.
- Calibration
  - Historical or observed water levels
  - Data used in calibration
  - Manning ‘n’ values for recorded flood flows
  - Manning ‘n’ values for design flood flows of the hydraulic study
- Reasons for selecting the bridge routines. The method used and assumptions made in the calculation of the effects of the bridges and culvert crossings and embankments on water surface profiles.

- Reasons for using the selected Manning's 'n' and bridge expansion and contraction coefficients in determining the water surface profiles under the design flows.
- Effects of water crossings and the velocity and the depth of water overflowing roads. A summary table listing depth and velocity of flows at the overtopped roads and flooded structures and the assessment whether safe access and egress are achievable using the acceptable risk criteria and a chart is to be used to illustrate the level of risk. Provide a summary of locations where safe access and egress is not achievable.
- Methods used and assumptions made in the determination of spill flows, areas affected due to spill, effects on downstream flows and floodlines.
- Flood levels determined by reservoir routing procedure
- Flood levels determined by dam break analysis
- Flood levels based on dynamic modelling
- Water surface profiles of design floods
- Flood prone areas
- Spill areas
  - Natural or manmade
  - Volume of spill
  - Impact on downstream flows and flood levels
  - Extend and depth of flooding due to spill

- Conclusions and recommendations
- List of publications referred by the Hydraulic Study
- Tables summarizing the following data and analyses
  - Observed flow hydrographs and water level profiles
  - Results of calibration
  - Results of sensitivity analysis
  - Parameters and coefficients used in the analysis
  - Design flows and flood levels at confluences or at critical locations

- The following maps and diagrams are to be included in the report:
  - A large scale topographic map showing the watershed and subwatershed boundaries and floodline mapping limits
  - Water surface profiles of design flows
  - Bridge data sheets including photographs
  - Other diagrams related to hydraulic analysis

- The following data and results of the analysis are to be included in the appendices of the report:
  - Flood level calculations based on reservoir routing analysis for structures with significant upstream storage
  - Input data and summary output of the backwater calculations

- All calculations for spill area analysis
- Input data and summary output of the dam break analysis
- Input data and summary output of the dynamic modelling analysis
- Input data and summary output of the final calibration run
- Input data and summary output for the sensitivity analysis
- Photographs of flood plain at representative reaches
- Other relevant information

- The following data in digital format are to be included as part of the Hydraulic Technical Report:
  - Input data and output of the backwater calculations
  - All calculations for spill area analysis
  - Input data and output of the dam break analysis
  - Input data and output of the dynamic modelling analysis
  - Input data and output of the final calibration run
  - Input data and output for the sensitivity analysis

- Other relevant information

3 Mapping

The Consultant must prepare floodplain mapping in paper and digital format, as well as the Final Report documenting the process of the project. In preparing the floodplain mapping, the Consultant must use the digital orthophotogrammetry developed by the City of North Bay as the background imagery or the collected orthophogrammetry collected in the City of North Bay.

3.1 Flood Hazard Limit

The regulatory flood hazard limit for the La Vase River is to be the 100-year flood event, a reduced standard as approved by the MNR in February 1987 and as per O. Reg. 177/06. The La Vase River is a two-zone floodplain in the following areas, where the flood fringe is the 1:100 year event and floodway is the greater of the 1:25 year events or 30m measured from top of bank:

- Main Channel – Riverbend Road to Lake Nipissing

The Consultant should review the flood fringe and floodway determinations, and recommend a floodway delineation for the La Vase River.

The floodlines of other flood events, including the Timmins Storm, are to be generated as a shape file, but not mapped.

3.2 Contour Intervals

Generate the base map for floodplain mapping by integrating the digital orthophotogrammetry collected in the City of North Bay and the DEMs produced under this project. The maps will have 0.5 metre contour interval with 0.25 metre interpolation and the full and half metre contours are to be labelled with elevations.

3.3 Map Sheets

The floodplain mapping sheets in paper format will have a key map showing the location of each map sheet with respect to the City map grid. Mapping sheets at 1:2000 scale are to be developed according to the template provided by the NBMCA. Line weights and colours will be specified. As a minimum, the map sheets should have the following information:

- Title block
- Flood hazard line
- Cross-sections labelled with the identification number corresponding to HEC-RAS output
- Water surface elevation
- Study limits
- Flow direction arrow
- Spills
- Street names
- Engineers Stamp
- Scale
- Legend
- Lot lines

3.4 Cross Sections

The location of each cross-section used in the HEC-RAS model will be shown with a light line on the map sheets. The chainage of each cross-section shall correspond to the HEC-RAS model. There shall be a spot elevation on each section giving the water surface elevation to the nearest centimeter for each floodline to be plotted. Chainages shall be given where the watercourse enters and leaves each sheet and at confluences. The legends used by the existing floodplain maps are to be followed.

3.5 TIN

The Consultant will develop a TIN using the mass points, breaklines and spot elevations and then to generate a tiled elevation DEM with grid posting = 1 m. The tiled surface DEM should represent full feature conditions (imagery and elevations) and it should be in ESRI file format with 0.5 metre contour interval with 0.25 metre interpolation. The elevation DEM is to be used for floodplain mapping visualization. The database of the DEM includes the following:

- Floodlines under various design floods
- Flood hazard area
- Hydrographic features (streams, lakes, shorelines, etc.)
- Cross-section lines
- Contour and digital elevation model data
- Drainage area boundaries
- Bridge cross-section data
- Engineering data files related to cross-sections, basin, flows, dams, etc.

3.6 Metadata

The Consultant will create metadata for both individual features and for the data layers with features derived from the source. The metadata is to be created in ESRI format and it can be automatically moved, copied and deleted along with the data source.

4 Final Report

The Consultant will prepare a Final Report to document the process of the project. The report is to be sealed by a professional engineer licensed to practice in Ontario.

4.1 Report Format

The format of the report and the information to be included in the report are summarized as follows:

- Introduction
  - Purpose of the study
  - History of flooding problem
  - Past floodplain mapping study
  - Criteria used for floodplain mapping
- Background Information
- Study Area, including study scope and limits

- Hydrology
- Hydraulics
- Floodline Delineation
  - Description of base mapping used and how it was developed
  - The technical summary of mapping (paper and digital, scale, contour intervals, accuracy and checking
  - Explanation of how the floodlines were identified
  - Identify flooding problem areas and causes
- Discussions
  - Discussion on any major differences between the existing floodlines and the new floodlines estimated by this project by comparing the location of floodline, total flood area, water depth, flow velocity, etc.
  - Discuss general observations regarding spill areas, flood vulnerable sites, overtopping at ingress and egress, flow velocity and depth at these locations
  - Discuss and summarize possible alternatives to relieve flood impacts
- Conclusions and Recommendations
- Reference

  Exhibits
  - Location maps to identify study area
  - Land use maps for both existing and future conditions
  - Identification of historically flooded areas, if any
  - Historical photos, if any
  - Tables to provide a summary of cross-section number, discharges, elevations and velocities
  - Tables to provide a summary of discharge, velocity and depth of water in all road crossings within the floodplain.

Appendix B:

General Terms and Conditions

General Terms

The North Bay-Mattawa Conservation Authority reserves the right in its sole discretion and for any reason to accept or reject any proposals submitted. There will be no direct payment for the preparation and submission of proposals or to attend any interview in response to this request for proposals. The North Bay-Mattawa Conservation Authority reserves the right to negotiate changes in the technical content of the most satisfactory proposal. The North Bay-Mattawa Conservation Authority also reserves the right to seek clarification and supplementary information from bidders after the proposal submission deadline

At any time prior to the proposal submission deadline, a bidder may amend or withdraw a submitted proposal. The right of bidders to amend or withdraw includes amendments or withdrawals wholly initiated by bidders and amendments or withdrawals in response to subsequent information provided by addenda.

The Successful Bidder shall be responsible for preparing all contracts required for the services to be provided to the satisfaction of North Bay – Mattawa Conservation Authority and at no extra cost. All tendered work performed shall be in accordance with the specifications in this document.

1 Selection of Bidder

The NBMCA anticipates that the preferred bidder will be selected and approved by the Board of Directors within two (2) weeks of the proposal submission deadline. Notice of selection by NBMCA, to the selected bidder will be in writing in the same form in which the proposal was submitted.

2 Licensing

The Successful Bidder will be responsible for strict adherence to all Federal, Provincial, Municipal laws and Engineering codes and must obtain all permits and licenses as applicable including work completed by sub-contractors (if applicable).

3 Insurance

The Successful Bidder agrees to indemnify and save harmless North Bay-Mattawa Conservation Authority for any claims demand arising out of the performance by the Successful Bidder of the Contract. The Successful Bidder must provide proof of Comprehensive General Liability and Errors and Omissions Insurance equal to or in excess of $5,000,000 in Canadian funds. Safety Regulations and Labour Codes

4 Safety Regulations and Labour Codes

The Successful Bidder must adhere to all safety rules, regulations and labour regulations in effect in all jurisdictions where the work is to be performed.

5 Workplace Safety and Insurance Board

The Successful Bidder must supply proof of good standing with the Workplace Safety and Insurance Board at the request of NBMCA.

6 Billing Summaries

The Successful Bidder must provide sufficient detail on every invoice submitted to NBMCA to allow NBMCA to easily understand the nature and purpose of the invoice. Every bill shall include a running total of amount billed to date, the original upset limit, and will distinguish between base billing covered by contracted upset limit(s) and billing for extra work. An estimate of the percentage of the project completed as of the date of billing shall be included. Billing shall be submitted monthly and any work performed, as an extra, must be prior approved by NBMCA in writing. These conditions for billing and payment must be incorporated into any contract that may be prepared as part of the award process.

7 Influence

No person, company, corporation or organization shall attempt in any way, either in private or in public, to influence the outcome of any NBMCA purchasing or hiring process. Any person, company, corporation or organization that attempts to influence the outcome of this solicitation will be disqualified, and the person, company, corporation or organization may be subjected to additional exclusion or suspension from future projects.

8 Indemnity

The Successful Bidder agrees to indemnify and save harmless NBMCA from any claim or demand arising as a result of the performance or non-performance of this Contract by the Successful Bidder, and without limiting the generality of the foregoing, the Successful Bidder agrees to indemnify and save harmless NBMCA from any claim or demand arising after the expiry of any reasonable time limit fixed by the Clients for the completion of any work as assigned from time to time.

9 Confidentiality

Confidentiality of records and information relating to this Project must be maintained at all times.

All correspondence, documentation and information provided by NBMCA staff to any Proponent in connection with, or arising out of this Terms of Reference or the acceptance of any Proposal:

- Remains the property of NBMCA
- Shall be treated as confidential
- Shall not be used for any purpose other than for replying to the Request for Proposal and for fulfillment of any related subsequent Agreement

All correspondence, documentation and information provided to staff of NBMCA by any Proponent in connection with, or arising out this Request for Proposal, and the submission of any Proposal will become the property of NBMCA, and as such, subject to the *Municipal Freedom of Information Act* (MFIPPA) and may be released, pursuant to the Act. The Proponent's name at a minimum shall be made public on request.

Because of MFIPPA, the Proponent is advised to identify, in their Proposal, any scientific, technical, commercial, proprietary or similar confidential information, the disclosure of which could cause them injury.

Any information in the Proponents submission that is not specifically identified as confidential will be treated as public information.

All correspondence, documentation and information provided to NBMCA may be reproduced for the purposes of evaluating the Proponent's submission to this Request for Proposal.

10 Conflict of Interest Statement

In its Proposal the Proponent shall disclose to NBMCA any potential conflict of interest that might compromise the performance of the work. If such a conflict of interest does exist, NBMCA may, at its discretion, refuse to consider the Proposal.

If, during the Proposal evaluation process or during the negation of the Agreement, the Proponent is retained by another client, giving rise to a potential conflict of interest, then the Proponent shall so inform NBMCA. If NBMCA requests, then the Proponent shall refuse the new assignment or will take such steps as are necessary to remove the conflict of interest concerned.

Proponents are cautioned that the acceptance of their Proposal may preclude them from participating as a Proponent in subsequent projects where a conflict of interest may arise. The Proponent for this project may participate in subsequent/other NBMCA projects provided the Proponent has satisfied pre-qualification requirements of NBMCA, if any, an in the opinion of NBMCA, no conflict of interest would adversely affect the performance and successful completion of an Agreement by the Proponent.

11 NBMCA's Rights in Respect to the Request for Proposal

This Request for Proposal does not constitute an offer of any nature or kind whatsoever by NBMCA to the Proponent. The NBMCA does not bind itself to accept any Proposals and may proceed as it determines, in its sole discretion, following receipt of the Proposals. The NBMCA reserves the right to accept any proposal in whole or in part or to discuss with any Proponent, different or additional terms to those outlined in this Request for Proposal or in such Proponents proposal.

The NBMCA has the right to:

- Cancel the Request for Proposal at any time without liability whatsoever to any Proponent
- Reject any or all Proposals
- Accept any or all of the Proposals
- If only one Proposal is received, elect to accept or reject it
- Not to accept the lowest fixed fee amount
- To alter the schedule; Request for Proposal process, procedures or objective of the project or any other aspect of the Request for Proposal, as it may determine in its ole and absolute discretion; or
- To negotiate with one or more Proponents to reach a final agreement for the services.

It is in the nature of this Request for Proposal process that this Request for Proposal and/or the Proposal in response to the Request for Proposal will not constitute a binding agreement, but will only form the basis for the finalization of the terms upon which NBMCA and the chosen Proponent will enter into a final Agreement, and does not mean that the Proposal is necessarily totally acceptable in the form submitted. After the selection of a Proponent, if any, NBMCA has the right to negotiate with the Proponent and, as part of that process, to negotiate changes, amendments or modifications to the proposal without offering the other Proponents the right to amend their proposals.

12 Proponents Costs

All costs and expenses incurred by a Proponent related to the preparation or presentation of its proposal shall be borne by the Proponent. The NBMCA is not liable to pay such costs and expenses or to reimburse or to compensate a Proponent under any circumstances.

13 Delays

The NBMCA shall not be responsible for any delays or costs to the Proponents associated with any reviews or the approval process.

14 Funding

The award of any or all phases is conditional upon funding availability and approval by the Board of Directors of NBMCA.

15 Errors and/or Omissions

It is understood and acknowledged that while the Request for Proposal includes specific requirements, a complete review and recommendation is required. Minor items not herein specified but obviously required shall be provided as if specified. The Proponents shall satisfy themselves fully as to the extent of the work required and shall provide all services required to complete the intent of the project. Any misinterpretation of requirements within this Request for Proposal shall not relive the bidder of the responsibility of providing the services as aforesaid.

16 Changes to the Project

The Proponent shall take into account that during the term of the contract there may be regulatory changes that could impact the project. At this time the NBMCA does not foresee any changes to the outlined project but changes in legislation or budget constraints may necessitate changes. The NBMCA reserves the right to negotiate the scope of the assignment during the term of assignment to reflect issues such as budget concerns, regulatory changes, etc.

17 Negotiations

The NBMCA may award the Agreement on the basis of initial offers received, without discussion. Therefore, each initial offer shall contain the Proponent's best terms/information, including all required documentation as listed.

The NBMCA reserves the right to enter into negotiations with the selected Proponent. If NBMCA and the selected Proponent cannot negotiate a successful Agreement, NBMCA may terminate the negotiations and begin negotiations with the next selected Proponent. This process will continue until an Agreement has been executed or all Proponents have been rejected. No Proponent shall have any rights against NBMCA arising from negotiations.

18 Proponents to Investigate

Consulting firms and/or Proponents submitting a Proposal shall satisfy themselves by personal examination of the site, by such means, as they prefer, as to the actual conditions and requirements of the project.

Proponents shall not rely on information provided by NBMCA including reports, existing drawings or any work completed under prior assignments or any other information provided by NBMCA but shall satisfy themselves as to the accuracy of the information and accept full responsibility for design of the project.

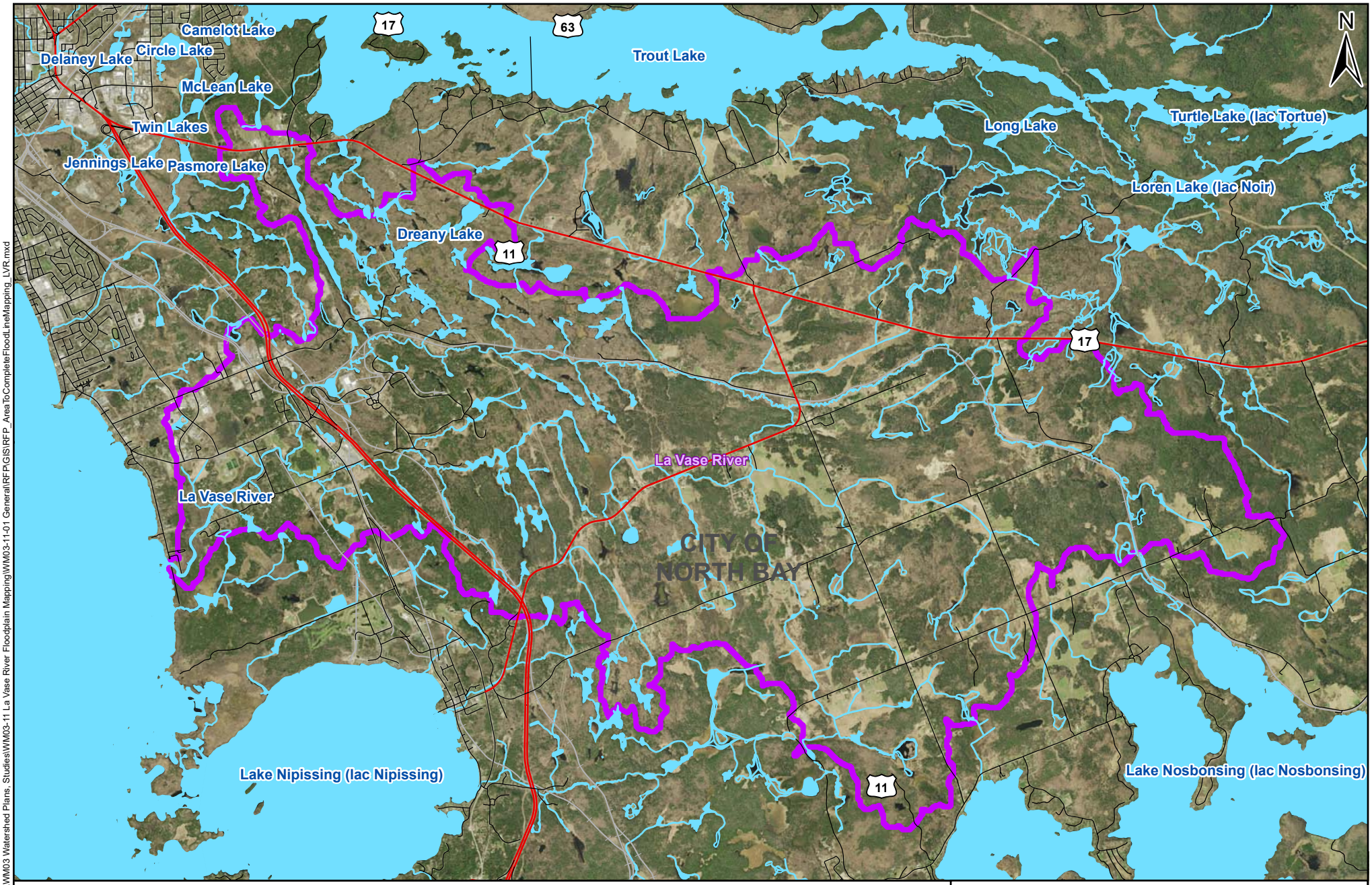
19 Data Sharing Agreement

The Proponent will be required to sign a Data Sharing Agreement with NBMCA. The NBMCA will be the sole owner of any reports, digital data and mapping project prepared on their behalf.

20 Agreement for Professional Consulting Services

The successful proponent will be required to execute a formal Agreement with NBMCA prior to initiating the project.

Maps



LEGEND

- ROAD
- HIGHWAY
- RAILWAY
- WATERCOURSE
- WATERBODY
- AREA TO COMPLETE FLOOD LINE MAPPING

MAP M-1: AREA TO COMPLETE FLOOD LINE MAPPING

0 1,000 2,000 3,000 4,000 5,000 6,000 m

1:80,000

NORTH BAY-MATTAWA CONSERVATION AUTHORITY
www.nbmca.ca

W:\NBMCA\WM - Watershed Management\WM03 Watershed Plans, Studies\WM03-11 La Vase River Floodplain Mapping\WM03-11-01 General\RFP\GIS\RFP_AreaToCompleteFloodLineMapping_LVR.mxd

LiDAR Extents