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ENGINEERING

Corporation of the City of Sault Ste. Marie

McNabb Street Drainage Environmental Study Report

February 2016

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Report Prepared By:

Pat McAuley, P.Eng.

REGISTERED PROFESSIONAL ENGINEER
P. M. McAULEY
Feb 29/16
PROVINCE OF ONTARIO

Report Reviewed By:

John V. McDonald, P. Eng.

LICENSED PROFESSIONAL ENGINEER
J. V. McDONALD
100082267
Feb 29/16
PROVINCE OF ONTARIO

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Street flooding on McNabb Street has occurred fairly regularly between Great Northern Rd and Willow Avenue, as a result of the storm sewer system surcharging during heavy rain falls. In addition buildings on McNabb Street have experienced both basement flooding and surface flooding in driveways and in parking lots. Further south, the Canadian Motor Hotel has also experienced flooding, both in the building itself and in the parking lot area. A Class Environmental Assessment (EA) has been undertaken by The City's Engineering and Planning Department to look for ways to reduce the frequency of flooding in the area.

Class Environmental Assessment

Infrastructure projects undertaken by municipalities must follow a Class Environmental Assessment process, which is a streamlined approach used for routine and predictable projects to fulfill the requirements of the Environmental Assessment Act. The Class EA process was developed to ensure that environmental concerns are addressed and public consultation is sought.

Alternative Solutions

As part of this Class EA alternative solutions have been developed to address the flooding concerns. These alternatives primarily address surface flooding only. As detailed in the report basement flooding needs to be addressed through various flood proofing techniques.

The first public open house was held in January 2014 to present the problem/opportunity along with alternative solutions and to seek input. Alternative solutions included complete sewer replacement of all undersized sewers all the way to the St Mary's River, underground storage, above ground storage in neighbourhood parks, and provision of relief sewers to increase pipe capacity as far as the natural ravine west of Pim Street. Temporary storage of runoff water would be necessary to prevent increased flooding south of Trelawne Avenue, unless downstream sewers were upgraded.

Based on public input during the first open house, the study area limits were expanded to include temporary storage of water in the natural ravine west of Pim Street over to Gladstone Avenue (the ravine located south of Great Lakes Honda). Storage would be provided by means of a control structure to prevent flooding downstream from Gladstone Avenue. Upstream storm sewer improvements would also be provided to better convey storm water flows away from the problem areas to the ravine. A second open house was held in November 2015 to present the preferred solutions for both conveyance improvements and storm water management in the ravine, along with various design concepts.

Preferred Conveyance Solution

Two new storm sewer installations were considered in the corridor south of McNabb Street to the ravine; one involved the construction of a relief sewer of suitable diameter in the easement alongside the existing system, and the second consisted of a complete replacement of the existing with a larger diameter pipe in the easement.

It was noted that both of these conveyance improvements should be done in conjunction with necessary pipe replacement of the Monterey Gardens Subdivision storm outlet running through the Canadian Motor Hotel's parking lot, from Poplar Avenue.

The preferred solution is to replace the existing pipe network with a new larger diameter storm sewer.

Preferred Temporary Storage Solution

Two alternative ravine storm water management designs were considered. The first one involves construction of an outlet control structure in the ravine east of Gladstone Avenue that allows normal volumes to pass and drain westerly, but retains above normal flows up to the City's 1 in 10 year design storm frequency, then releasing the excess over a period of time, once the storm event/snow melt has subsided. The second one includes building an outlet control structure that allows normal volumes to pass but retains above normal flows up to the City's 1 in 100 year design storm frequency. The ravine would receive water during a 100 year event from both piped flow and overland flow from Pim Street and Bruce Street and areas to the north.

The preferred solution is to construct the outlet control structure to accommodate the City's 1 in 100 year design storm thus providing increased protection to the downtown area. Maximum water depths in the ravine would be 3.5 - 4m adjacent to Gladstone Avenue. The expected drawdown time would be 8-12 hours following the end of the storm event. The added benefit of a storm water management facility would be an improvement in the quality of storm water being discharged.

McNabb Street Drainage
Class Environmental Study Report

PHASE 1: PROBLEM OR OPPORTUNITY

1 Introduction

1.1 Background and Purpose of Report

The City of Sault Ste. Marie has initiated this Class Environmental Assessment (Class EA) to identify and evaluate alternative ways to reduce the frequency of flooding in the McNabb Street area, east of Pim Street. There has been a history of street surface flooding during heavy rainfall events and subsequent basement flooding in nearby buildings.

Due to these concerns Tulloch Engineering Inc. has been retained by the City of Sault Ste Marie to complete a Class Environmental Assessment (EA) to study the storm water drainage in the area and recommend ways to reduce flooding frequency/severity. This Environmental Study Report (ESR) documents the decision making process leading to the selection of the recommended solutions.

1.2 Description of Study Area

As outlined in Figure 1 (all figures in appendices), the study area for the Class EA study includes McNabb Street between Pim Street and Willow Avenue, and Pim Street from McNabb Street southerly to 398 Pim Street (Bel Air Motel). The study area was chosen based on the occurrences of street flooding and basement flooding in the area. Subsequent to Public Information Centre (PIC) #1 the study area was expanded to include the possible use of the ravine system west of Pim Street, to temporarily store excess flows to reduce downstream flooding. It was recognized that increasing sewer capacity to improve drainage from the problem area would overwhelm downstream sewers unless temporary storage was incorporated in a storm water management facility. This revised study area is indicated in Figure 2.

1.3 Previous Studies

In 2012 a Storm Sewer Capacity Analysis and Condition Assessment was completed by Tulloch Engineering for the storm drainage area starting from Sault College southerly to the Monterey Gardens Subdivision and westerly to Pim Street. The drainage area is depicted in Figure 3. The pipe capacity analysis and pipe condition assessment was initiated by the City following an August 15, 2011 resolution of City Council:

> *Whereas the YMCA has raised concerns about the adequacy of the City's storm sewer system in their area, in light of two recent flooding incidents; and Whereas these two incidents in July have had a great financial and operational impact on the YMCA; Now*

> *Therefore Be If Resolved that the City's Engineering Department carry out a site visit and review of the circumstances around these two incidents and report back to City Council within one month as to any inadequacy of the City storm sewer system that contributed to these events and that steps be identified that* can *be taken by the City and the YMCA to reduce any further incidents of flooding.*

An analysis of the storm drainage system in the McNabb Street area was completed in 2012. The report "Storm Sewer Capacity Analysis and Condition Assessment" including appendices and drawings is available upon request. In summary it concludes:

"A hydraulic capacity check of the storm sewer progressed from the outlet at the ravine location west of 398 Pim Street upstream through the storm sewer network to Willoughby Street. The model includes a second storm sewer branch from Algoma Family Services (205 McNabb Street) to Northern Credit Union (280 McNabb Street). The results indicate the storm sewer is inadequate to convey flows from a 2-year storm without the presence of surface flooding in the vicinity of Algoma Family Services. The critical capacity restrictions occur south of Algoma Family Services towards the ravine outlet."

The YMCA at 235 McNabb Street is adjacent to Algoma Family Services, and drains to the same storm sewer system.

The following preliminary alternatives to address the flooding issues were considered feasible and suggested in the study:

1. Storm sewer replacement with larger diameter pipe.
2. In-line storm water storage within the existing roadway/easement corridor(s) using oversized pipes, box culverts, wet/dry ponds and/or other storm water management techniques.
3. Off-line storm water storage/management by creating storage outside of existing roadways/easement corridors (i.e. within existing park lands).
4. Install relief pipes to provide overflow capacity at a shallower depth than the existing system along the current storm sewer alignment south of 205 McNabb Street – Algoma Family Services to the ravine outlet.
5. Install relief pipes to provide overflow capacity, connecting McNabb Street to Pim Street from Algoma Family Services to the intersection of Pim Street and Great Northern Road.

1.4 History of Flooding

There have been numerous instances of flooding associated with the YMCA, Algoma Family Services, the Group Health Centre and the Canadian Motor Hotel. Both surface flooding on roads and water entering basements has resulted in calls to the Department of Public Works. The City Council resolution of August 15, 2011 was prompted by flooding after a 31.4 mm rainfall on August 7, 2011.

Correlating rainfall events with calls to Public Works and Transportation (PWT) for either a sewer rodding request or a flooding request is difficult, but the following rainfall events appear to have caused either surface flooding or basement flooding calls in the study area, based on PWT records:

Date	Environment Canada Daily Rainfall at Airport
July 11, 1987	2 days of rain: 16.2 mm and 17.2 mm
October 4, 2005	32.2 mm
July 11, 2011	34 mm
August 7, 2011	31.4 mm
July 26, 2013	54.3 mm
September 10, 2013	2 days of rain: 24.5 mm and 20.8 mm
November 17, 2013	70.7 mm

This information suggests rainfall events of over 30 mm in a 24 period has caused flooding issues in the past, however the following cautions are needed:

- The data is from the Sault Ste Marie airport 15 km to the west and the amount of rainfall in the study area may differ.
- Service requests to Public Works for flooding may have been caused by a plugged sewer lateral, a main blockage or a plugged catch basin lead, and not due to the inability of the sewer to handle the flow rate.
- There are numerous rainfall events over 30 mm in the past 25 years that did not result in service requests to PWT
- Recorded rainfall data is for a 24 hour day, and intensity (mm/hr) is not known
- Melting snow and its contribution to sewer flow is not accounted for in measured rainfall.
- Saturated ground conditions from previous rainfall or snow melt is not accounted for.
- Not all flooding events are reported to PWT.
- Various property owners have made improvements to reduce basement flooding over the past several years (flood proofing) so the frequency of basement flooding should be reducing with time.

1.5 Structural Issues In Existing Sewer

The 2012 Storm Sewer Capacity Analysis and Condition Assessment reviewed the condition of the existing sewer system in the study area. Appended Figures 4a – 4e depict the storm sewer plan and profile. Closed circuit television (CCTV) surveys were conducted along the McNabb Street storm sewer from the outlet into the ravine west of 398 Pim Street north to 205 McNabb Street. The CCTV surveys noted the following deficiencies within the storm sewer:

1. Approximately 10m downstream of maintenance hole #3 (in Canadian Motor Hotel parking lot at 410 Pim Street), the pipe displays severe longitudinal cracking along the roof and the side walls and may be structurally deficient.

2. Immediately downstream of maintenance hole #2 (on east side of Pim Street at ravine), there exists a large joint gap. The camera did not traverse past this joint (under Pim Street).

In addition to the CCTV camera survey completed for the 900 mm/1050 mm trunk sewer, an attempt was made to survey the 450 mm corrugated steel pipe (CSP) sewer that connects the Poplar Avenue storm sewer system (draining Monterey Gardens Subdivision) to MH # 3 above. This sewer traverses the Canadian Motor Hotel's parking lot, north of the existing motel building (see Figure 5). Only 49 m of sewer was able to be videotaped starting in the Poplar Avenue manhole and heading westerly, due to poor pipe conditions. The video revealed deformed pipe, corrosion and bricks protruding through a joint at the 49 m mark. It is evident this pipe, which was installed in 1961 along the bottom of a branch of the main ravine will need to be replaced.

It was an assumption in this Class EA that repairs to or replacement of the above noted deficiencies will need to be carried out regardless of the recommended alternative. The need to make these repairs may also influence the selection of the preferred alternative.

450 mm storm sewer draining west from Poplar Avenue through Canadian Motor Hotel parking lot

1.6 Problem Statement

The problem can be stated as follows: Both surface flooding and basement flooding have occurred in the McNabb Street/Pim Street and Willow Avenue area (the study area) in part due to the inadequacy of the storm sewer system to handle storm water flows to current City standards and in part due to the lack of flood proofing of affected buildings. Solutions are needed to reduce the frequency of flooding being experienced.

2 CLASS ENVIRONMENTAL ASSESSMENT PROCESS

Municipal infrastructure projects are required to meet the requirements of the Ontario Environmental Assessment (EA) Act. The Municipal Class EA (October 2000, as amended in 2007/2011) applies to a group or "class" of municipal road, water and wastewater projects which occur frequently and which have relatively minor and predictable impacts. These projects are approved under the EA Act, as long as they are planned, designed and constructed according to the requirements of the Class EA document. A flow chart detailing the Municipal Class Environmental Planning and Design Process is included in Appendix 1.

The selection of a preferred alternative is subject to the Class Environmental Assessment planning process. The preferred solution is found through the key principles of environmental assessment planning:

Consultation

Reasonable range of alternatives

Consideration of effects on all aspects of the environment

Systematic evaluation

Clear documentation

Traceable decision making

The specific requirements of the Class EA for a particular project depend on the type of project, its complexity and the significance of environmental impacts. Stormwater issues are covered under the Water and Wastewater section of the Municipal Class EA. To assist proponents in determining the status of projects, four categories of projects are identified in the Municipal Class EA document, including Schedule "A","A+", "B" and "C" projects:

Schedule A

These projects are limited in scale, have minimal adverse environmental effects, and typically consist of normal maintenance and operational activities. These projects are considered pre-approved and may proceed without following the full Class EA planning process.

Schedule A+

These projects are also limited in scale, have minimal adverse environmental effects, and are considered pre-approved, but there is a requirement for public notification prior to construction or implementation of the project. The purpose of the notification is to inform the public of projects occurring in their local area. Although the public is informed of the project, there is no appeal mechanism to the Ministry of the Environment and Climate Change (MOECC). Any concerns raised can be addressed at the municipal council level.

Schedule B

These projects have the potential for some adverse environmental effects, thus requiring a screening process involving mandatory contact with directly affected public and relevant review agencies. If all concerns can be adequately addressed, the project may proceed. These projects generally include improvements and minor expansions to existing facilities.

Schedule C

These projects have potential for significant environmental effects and are subject to the full planning and documentation procedures specified in the Class EA document. An Environmental Study Report must be prepared and submitted for review by the public and relevant review agencies. If all public and agency comments and issues can be adequately mitigated, the project may proceed. These projects generally include construction of new facilities or major expansions to existing facilities.

2.1 Schedule Selection

The Storm Sewer Capacity Analysis and Condition Assessment Report listed a number of alternatives that were considered feasible methods of addressing the flooding issues. In order to determine the appropriate Class EA schedule for these various solutions, the Municipal Class Environmental Assessment documents offer the following definitions to assist:

2.1.1 Schedule "A" Activities

Municipal Wastewater Management Projects Description # 1:

"normal operations… modify, repair, reconstruct existing facilities,… relining, repairs and renovations to existing sewage collection systems"

It can be concluded that regular sewer repairs and replacement of existing sewers are considered to be Schedule A activities.

Municipal Wastewater Management Projects Description # 11:

"Establish new or replace or expand existing storm water detention/retention ponds or tanks and appurtenances including outfall to receiving water body providing all such facilities are in either an existing utility corridor or an existing road allowance."

It can be concluded that establishing stormwater retention/detention ponds is considered a Schedule A activity, provided they are in road allowances or utility corridors.

2.1.2 Schedule "B" Activities

Municipal Wastewater Management Projects Description # 2:

"Establish new stormwater retention/detention ponds and appurtenances or infiltration systems including outfall to receiving water body"

It can be concluded that establishing a stormwater retention/detention pond is considered a Schedule B activity if it is established in a location other than in a road allowance or utility corridor.

2.1.3 Schedule "C" Activities

Municipal Wastewater Management Projects Description #10:

"Construct a new dam or weir in a watercourse"

It can be concluded that establishing a stormwater retention/detention pond is considered a Schedule C activity if it is established in a watercourse, through the construction of a dam or weir. A watercourse is defined in the Municipal Class Assessment documents as: *"flowing water, though not necessarily continuous, within a defined channel and with a bed and banks which usually discharges itself into some other watercourse or body of water"*

2.1.4 Initial Schedule Selection

Based on the above, the study was initially considered a Scheduled B activity, given one of the options previously suggested in the capacity study involves the establishment of stormwater detention/retention ponds off road, potentially on municipal parkland. The Schedule selection was confirmed as options were analyzed and a preferred solution established. (As noted in Section 6 the schedule selection has been changed to a Schedule C, to consider the use of a natural ravine for storm water management.)

2.2 Publication Notice – Notice of Study Commencement

In order to notify affected/interested residents of the study, a Notice of Study Commencement was published in the Sault Star December 7 & 14, 2013 (Appendix 2). A study area (Exhibit 2) was determined based on the problem statement. The notice was also mailed to all property owners in the area using owner information obtained from the City. In addition, notices were mailed to other parties with potential interest: Garden River First Nation, Batchewana First Nation, Métis Nation of Ontario, Sault Ste Marie Regional Conservation Authority, EA Coordinator Ministry of the Environment, and Ward 2, 3 and 4 City Councillors.

PHASE 2: ALTERATIVE SOLUTIONS

3 INVENTORY OF EXISTING CONDITIONS

3.1 EXISTING DRAINAGE CONDITIONS

3.1.1 OVERVIEW OF THE DRAINAGE SYSTEM

Sanitary Sewer System

The McNabb Street / Pim Street area is serviced by both storm sewers and sanitary sewers. The sanitary sewer system is not part of the Environmental Assessment undertaking, however, it is noted that the sanitary system can also back up or surcharge, if excessive storm water gets into the system, either through infiltration of storm/ground water into the system, or from inflows from weeping tile or sump pump connections. If excessive storm water finds its way into the sanitary drainage system basement flooding can thus occur. For this reason, the City, through the Sewer Use Bylaw 2009-50 and the Ontario Building Code has emphasized the need to isolate basements from the effects of surcharged sanitary sewers (flood proofing) through the use of back check valves, sump pumps and other means.

Storm Sewer System

The storm drainage system in the McNabb/Pim/Willow area is the subject of this Class EA. The system is a series of storm sewer pipes, draining generally from north to south towards the St Mary's River, and carries water from rainfall and melting snow. Catchbasins connected to the sewers intercept surface runoff along the streets and from private parking lots; whereas ditch inlets connected to the sewers intercept runoff from swales between rear yards and from topographically low/depressed areas.

The principal element of the storm sewer system in this area is a 900 mm/1050 mm storm sewer draining south from McNabb Street, under the parking lot of Algoma Family Services (205 McNabb Street) through Poplar Park, and under the Canadian Motel parking lot (410 Pim Street), out letting into the large ravine on the west side of Pim Street. It increases from 900 mm to 1050 mm diameter from the Canadian Motor Hotel's parking lot to the ravine outlet.

Minor and Major Drainage Systems

Storm sewers are designed to convey flows during the most frequent rainfall events and are designed for a certain magnitude of storm events and thus make up the "minor" drainage system. Flows that exceed the capacity of the storm sewers are typically conveyed along the ground surface (i.e. "overland") accumulating in low spots on roads, in parks or on private property. The overland system

makes up the “major” drainage system since it conveys flows in excess of the minor system during larger magnitude, more infrequent storm events.

The overland paths generally follow the paths of the flows in the storm sewers, however in some cases the paths differ. In addition, the overland flow path can encounter low lying areas and road “sag points” that can result in ponding of stormwater.

Current design standards for new developments require the designer to consider overland flow routes and to accommodate the flows from large storm events using municipal property whenever possible, until it reaches a natural river, creek or other water body. The 900/1050 mm diameter storm sewer in question was installed in the early 1960’s before major drainage system routes were being considered. Thus surface flooding/ponding occurs both on municipal roads and on private property (parking lots or other low lying areas) when the capacity of the sewer is exceeded, since the traditional overland flow route has been filled in.

Ponding in road sag in front of 205 McNabb Street Nov 17/13

Flows typically fill up a depression area once storm sewers can no longer handle the volume of water and then eventually continue along the overland flow path.

Although detention of stormwater along the overland flow paths can help to reduce the rate of runoff downstream, it can also cause problems if the ponding is excessive. Ponding would typically be considered excessive if it causes undue risk to the safety of the public or results in significant damage to property.

Ponding in parking lot of 205 McNabb Street Nov 17/13

As noted in the 2012 Storm Sewer Capacity Analysis and Condition Assessment, the 900 mm trunk storm sewer that services this area is inadequate to convey flows from a 1 in 2-year storm. As a result, the sewer surcharges relatively frequently and surface flooding occurs. Basements directly connected to it are also prone to flooding if they have not been flood proofed (see Section 3.1.2 Sewer Use Bylaw).

Trunk Storm Sewer History

The 900 mm diameter concrete pipe storm sewer was constructed between 1960 and 1962, according to a City Plan and Profile drawing # A-42. It was installed along the bottom of a ravine, thus explaining its 7 to 8 m depth. At the time, Pim Street and McNabb Street were existing roads with concrete culverts where they intersected the ravine. A 1958 topographic map of the area is attached as Figure 6 showing the ravine system prior to the sewer installation.

The 1960-62 storm sewer installation thus appears to have connected an existing 1050 mm diameter concrete cross culvert under Pim Street with an existing 900 mm culvert crossing under McNabb Street, placing the ravine drainage into a pipe. Piping the ravine was followed by storm sewer construction on McNabb Street between Pim Street and Brien Avenue in 1963.

A branch of the ravine also extended east towards and beyond Poplar Ave, just to the north of the current Canadian Motor Hotel building. This branch was also piped with a 450 mm diameter corrugated steel culvert connecting from the culvert that was in place under Poplar Avenue with the 900 mm trunk sewer, at approximately the same time. It is unknown if this was done by the municipality or by the developer of the hotel at 410 Pim Street.

Connecting the two road cross culverts (Pim and McNabb) with a 900/1050 mm diameter pipe along the ravine bottom and connecting the Poplar Avenue culvert to it allowed the entire ravine system in the area to be filled in. It is assumed this was done to permit future development. It also permitted the creation of Poplar Park on former ravine lands.

Poplar Park

3.1.2 City of Sault Ste Marie Storm Drainage Policies and Practices

There are a number of policies, practices and guidelines that are in place in Sault Ste Marie that have an impact on storm drainage in the City. These are described below.

City of Sault Ste Marie Official Plan

The City's Official Plan sets goals for environmental sustainability. Official Plan goals that relate to the issues being addressed in this study include:

- To encourage protection of natural environmental features which are located on both public and private lands
- To recognize the linkages between and among natural heritage features and areas, surface water features and ground water features
- To encourage watershed planning in the region
- To encourage stewardship practices throughout the community
- To utilize the best available information when managing development that affects the natural environment

1965 Proctor and Redfern Storm Sewer Design Document

In 1965, Proctor and Redfern, Consulting Engineers undertook a comprehensive review of the City's sanitary and storm drainage systems and drainage design practices, as well as reviewing sewage treatment and future sewer needs for a twenty year period. The resulting *City of Sault Ste Marie Drainage Report* recommended the use of a 1 in 10 year return period storm when designing storm sewer systems in the City. An Intensity Duration Frequency graph was developed and provided in the report along with an Intensity-Time of Concentration graph. This was used for many years by City staff and consultants designing drainage works in the City using the Rational Method. In recent years, this has been revised in order to incorporate additional Intensity Duration Frequency (IDF) data as it became available from Environment Canada weather station at the Sault Ste Marie airport. The 10 year design storm is still the standard for the City Engineering Department.

The storm sewers installed in the ravine east of Pim Street up to McNabb Street and the previously installed pipes under Pim Street and McNabb Street were installed prior to the 1965 Proctor and Redfern report. As a result, they were not designed using the 10 year return period frequency developed for the City. It is unknown what method was used by staff or consultants to determine pipe diameters and design storm sewer systems prior to 1965. As noted in the 2012 "Storm Sewer Capacity Analysis and Condition Assessment" study, they appear to be undersized to carry a 1 in 2 year return period rainfall event.

- Sewer Use Bylaw 4440/Bylaw 2009-50

Sewer Use Bylaw 4440 has been in place since the late 1960's detailing both sanitary and storm sewer use regulations. It was updated in 2009 with Bylaw 2009-50. Both bylaws describe how connections are to be made to sewer mains and methods on how to prevent back flow from sewers into buildings (flood proofing). A series of schedules are included in the bylaws with sketches showing when back water valves and sump pumps are to be installed. The bylaw correlates with the drainage and sewer connection requirements of the Ontario Building Code.

Ontario Ministry of the Environment 2003 Stormwater Management Planning and Design Manual

This manual provides technical and procedural guidance for the planning, design, and review of stormwater management practices. It incorporates provincial best practices and addresses water quantity, erosion control, water quality protection, and water balance principles into the selection and design of Stormwater Management Practices (SWMPs). It has been adopted by the City, and is the basis of the City's policy on quantity control where post development storm water flows from new developments must be equal to, or less than the pre- development flow from the site, for all storms up to the major drainage system design storm (1 in 100 year).

2015 Stormwater Master Plan and Policy

In 2007, City Council approved a stormwater management study and the development of a master plan. The goals of the study were to:

- Update and develop policies for the design of the City storm sewer conveyance system;
- Develop policies for the design of stormwater management infrastructure; and,
- Develop a capital works program to implement stormwater management infrastructure.

A draft report was issued by R.V. Anderson Associates Limited in 2013, and the final report issued in 2015. A city wide storm water management approach is recommended including the implementation of a new Stormwater Management Policy. The policy addresses storm water quality, as well as quantity. Improvements to storm water conveyance systems at known problem areas are also recommended. The McNabb Street and Pim Street area is recognized in the report as an area requiring improvements to the capacity of the storm sewer system.

3.2 Inventory of Natural and Socio-Economic Environments – Initial Study Area

3.2.1 Natural Environment

A prominent feature of the topography of Sault Ste Marie is a noticeable beach escarpment located approximately 1 to 3 km up from the shores of the St. Mary's River. It is irregular in direction, reaching its furthest southerly point where Pim Street is located (the Pim Street hill). Water runoff from this escarpment has eroded various ravines over time. As noted on Figure 3, the ravine which extends from the MacDonald Avenue hill near Trelawne Avenue easterly across Gladstone Avenue over to Pim Street is the drainage outlet for the McNabb / Pim study area.

Prior to human development, the McNabb Street/ Pim Street area was forested lands at the top of the escarpment. As roads were constructed, culverts were placed in the ravine to allow for continued drainage. The ravine which now ends on the west side of Pim Street, just south of 415 Pim Street (Great Lakes Honda), at one time extended north easterly, through present day Poplar Park, and across McNabb Street. (see the 1958 topographic map in Figure 3). One branch terminated on the east side of the present day Canadian Tire/Cambrian Mall in the vicinity of the Group Health Centre parking lot. Another branch crossed McNabb Street east of Willow Avenue, cutting across where the current parking lot of the YMCA is situated and terminating north of Chapple Avenue. When Poplar Avenue was constructed, the road alignment was situated to avoid this branch of the ravine.

The study area has been subject to extensive urban development with roads, parking lots and institutional and commercial buildings with large flat roof areas. These buildings are located on both sides of Pim and McNabb Streets. Residential properties on Poplar Avenue back onto Poplar Park, also a part of the study area. Poplar Park was created by filling the above noted ravine with up to 8 metres of fill, once the storm sewer was in place.

The only natural area remaining in the study area is the ravine on the west side of Pim Street. It too has been altered by the addition of fill along its edges in various locations, added by property developers to increase the useable flat land on either side of the ravine.

3.2.2 Soils

The natural soils in the study area consist of lacustrine clay overlaying glacial till, with bedrock (Jacobsville Formation) at approximately 15 metres deep. The permeability of the clay is extremely low. As a result, rainfall and snow melt tend to accumulate on the surface and run off, rather than seep into the ground.

The former ravine system has been filled with substantial quantities of imported fill. The material used to fill over the storm sewer is unknown. A geotechnical investigation will need to be undertaken, should the preferred solution involve infrastructure improvements in the former ravine location.

3.2.3 Groundwater Conditions

The static water table varies throughout the escarpment area, and is influenced by topography, surface drainage and the location of the former ravine system in the area. It is assumed the water table is relatively close to the surface, 2-3 metres deep, in the study area.

3.2.4 Socio- Economic Environment

McNabb Street and Pim Street are urban arterial roads in Sault Ste Marie. McNabb Street forms the dividing line between Ward 2 and Ward 3. Ward 4 is on the west side of the Great Northern Road/Pim Street corridor, starting on the north side of Bruce Street. Therefore, the study area encompasses parts of Wards 2, 3 and 4. The 2011 traffic count on McNabb Street, east of Pim Street indicates approximately 22,000 vehicles use the street each day. Pim Street carries approximately 17,000 vehicles per day, south of Bruce Street. Excessive water ponding on arterial streets is of concern due to the impact on vehicular traffic and pedestrian traffic on adjacent sidewalks.

The City's Official Plan lists the area's land use as commercial, institutional, residential and parks/recreation. Poplar Park is the area zoned as parks/recreation, and is located over the former ravine lands filled in the 1960's. The primary activity in the park appears to be the use of the walking trail by area residents. There were no Environmental Constraints noted for the study area, but the ravine west of Pim Street is considered a "natural constraint" and it is a regulated area by the Conservation Authority under Ontario Regulation 176-06. The ravine crosses private, municipal and school board properties and is largely unmaintained, with deadfall trees, debris and litter in evidence.

A review of Schedule E in the Official Plan indicates the potential for archaeological resources may be found in the Poplar Park area and the ravine system west of Pim Street. Given that the entire park area was a ravine, now filled with 6-8 metres of fill over a storm sewer, an archaeological assessment was not completed for Poplar Park but an assessment was completed for the ravine system to the west (see Section 7.2.3).

3.2.5 Terrestrial Features – Initial Study Area

As noted, the study area is an urbanized area divided east and west by McNabb Street and north and south by Pim Street. There are no areas of provincial status such as Environmentally Sensitive Areas (ESAs) or Provincially Significant Wetlands (PSWs) within the study area. The area is covered primarily by asphalt, concrete and the footprint of large commercial/institutional buildings. Where vegetation cover exists, it consists primarily of grassed lawn areas and native trees that were planted, or grew in naturally after the former ravine system was filled during the 1960's. Based on current site conditions, it is deemed unlikely that any rare species would be expected to be encountered predominately due to the lack of naturalized habitat. Wildlife habitat is minimal, and any habitat that does exist would not be subject to reductions with any of the alternative remedial measures being considered.

3.2.6 Aquatic Features

The initial study area does not include notable aquatic habitat, with storm drainage taking place in underground sewers. The sewer system outlets into a ravine on the west side of Pim Street. Aquatic features in the ravine are discussed in the Natural Environment: Existing Conditions & Impact Assessment Report in Appendix 4. The ravine is a regulated fill area and should work be proposed west of Pim Street, a development permit from the Sault Ste Marie Region Conservation Authority would be required.

3.2.7 Economic Loss Issues within the Study Area

As noted in Section 1.4, basement flooding and surface water accumulation has occurred in the past following major rainfall events. Property owners have suffered economic loss as a result primarily due to water damage in basements. Storm water has entered buildings in the study area from storm and sanitary sewer connections, rainwater leads running through the building and from overland flow from parking lots. As building owners take steps to flood proof their buildings to prevent storm water entry, basement flooding incidents are expected to decrease. (See Section 3.1.2 Sewer Use Bylaw 2009-50)

As noted in the information packages from the two Public Information Centres (PIC #1 and PIC #2) (see Appendices 3 & 6) the Group Health Centre at 240 McNabb Street, and the YMCA at 235 McNabb Street have taken steps to flood proof their buildings after experiencing flood damages, and Algoma Family Services at 205 McNabb Street has requested contact information at PIC #2, to do the same.

4 Investigation of Potential Remedial Measures

4.1 Lot Level (Source) Controls, Conveyance Controls and End of Pipe Controls

Remedial solutions to handle excess storm water can be divided into three types of control: lot level or source controls, conveyance controls and end of pipe controls. Lot level or source controls are applied on a lot by lot basis in order to reduce peak flows and runoff volumes and enhance runoff quality. Examples include roof leader disconnects, roof top or parking lot storage, rain barrels, pervious driveways and soak away pits or infiltration trenches. To have a positive impact they are best suited to smaller drainage areas (< 2 ha) and incorporated during original subdivision or development design.

Because of the cost associated with retro fitting existing development, it is difficult to obtain substantial flow reduction in a developed area through voluntary means.

Conveyance controls address the piped sewer system and include the use of underground storage in large diameter "super" pipes or use of catch basin inlet controls to slow water entry into the sewer system.

End of pipe controls include wet and dry pond storage, use of wetlands and other storm water management facilities. Storage ponds receive water from a conveyance system, store it temporarily and eventually discharge it to a receiving water body. End of pipe controls are widely used for flood and erosion control as well as for water quality improvement.

4.2 Surface Flooding versus Basement Flooding

The problem statement addresses both surface flooding and basement flooding. In order to investigate remedial solutions it is necessary to differentiate between these two consequences of excessive storm water flows.

As noted in Section 3.1.2, the 10 year return period storm is the standard used by the City for storm sewer design. It is based on rainfall intensity duration data from Environment Canada. Thus, a 10 year rainfall event has a 10% probability of occurring in any given year. A sewer designed to this standard is expected to successfully convey the runoff from many rainfall events, but there is a 10% chance each year it will be subjected to more stormwater than it can handle, with resulting flooding. Surface flooding during a rainfall is usually tolerated if it only results in temporary ponding in road sag points and other low lying areas.

Basement flooding often results in financial losses and is not considered tolerable to building owners. Thus a 10 year design storm standard that is adequate for storm sewer design for road drainage systems is not adequate with regard to basement flooding. The solution to basement flooding is to flood proof buildings to prevent water entry, from either a surcharged sewer or overland flow. Conformance to Bylaw 2009-50 (Section3.1.2) provides the best means of preventing basement flooding from surcharged sewers. Basement flooding can also be the result of overland flow during rainfall events. This can be addressed by lot grading techniques and the use of swales to direct overland flow away from foundations.

The following alternative solutions therefore address the reduction of surface flooding in relation to the City's storm sewer design standard. It is also recognized that reducing surface flooding will lessen the potential for basement flooding, but property owners still need to consider flood proofing techniques.

4.3 Alternative Solutions

In the 2012 "Storm Sewer Capacity Analysis and Condition Assessment", a number of alternative solutions were identified. These have been restated below and were investigated based on technical, environmental, social and economic merits in an effort to develop the preferred solution. New alternatives were also added. One considered more passive ways to reduce the amount of storm water

in the system or to reduce the peak flow, using lot level and conveyance controls. This includes roof leader and weeping tile disconnects, rain barrels, use of catch basin inlet control devices, roof or parking lot storage and other current techniques.

In addition two new alternatives were added to consider the use of the natural ravines west of Pim Street for the temporary storage of excess storm water. It was observed during the November 17, 2013 flood that these ravines naturally store water due to restricted cross culvert capacity at the Gladstone Avenue culvert crossing and due to the inlet grate restrictions experienced at the MacDonald Avenue/Trelawne Avenue inlet. The potential for temporarily storing water in these ravines was considered in conjunction with increased conveyance capacity in alternatives five and six. By considering these ravines for storage, the study was expanded to include properties around them.

The do nothing alternative was added to represent current conditions as a baseline that the alternatives were compared to. It is noted that the preferred solution may be a combination of various alternatives.

The alternatives considered were the following:

1. Storm sewer replacement with larger diameter pipe as needed, to the St Mary's River.
2. Underground storm water storage within the existing roadway/easement corridor(s) using oversized pipes or box culverts.
3. Storm water management by creating a dry pond in Rosedale Park.
4. Storm water management by creating a dry pond in Poplar Park.
5. Install a relief sewer to provide overflow capacity at a shallower depth than the existing system along the current storm sewer alignment south of 205 McNabb Street (Algoma Family Services) to the ravine outlet and create a temporary storage/stormwater management facility in the ravine system.
6. Install a relief sewer to provide overflow capacity by constructing new sewers on McNabb Street and Pim St to the ravine outlet, and create a temporary storage/stormwater management facility in the ravine system.
7. Peak flow/runoff reduction techniques and emphasis on flood proofing.
8. Do nothing.

All alternatives are in addition to the needed replacement or rehabilitation of the structurally deficient sewers described in Section 1.5.

5 EVALUATION OF ALTERNATIVES

5.1 EVALUATION CRITERIA

In order to evaluate the alternative solutions, the following evaluation criteria were developed. The ratings are shown in the chart below, and should be read as the higher the number of asterisks (***) the better the expected result. (i.e. the less impact on the environment or the lower the cost)

1) How well will the alternative solve the problem, as identified in the problem statement?
2) Are impacts to the natural environment minimized? (How well does the alternative meet the environmental sustainability goals of the City's Official Plan? Will water quality be improved?)
3) All undertakings have some negative impacts on people (residents, business owners, motorists, cyclists, pedestrians, tourists, etc), possibly short and/or long term. To what extent does the alternative minimize the negative impacts on the social, cultural and economic environments?
4) How significant are the impacts to private and/or public property? This criterion considers both the short term effects of construction and the long term benefits of the solution to properties involved.
5) Cost implications: How cost effective is the alternative in solving the problem?

5.2 Evaluation Results

	Alternative #1	Alternative #2	Alternative #3	Alternative #4	Alternative #5	Alternative #6	Alternative #7	Alternative #8
	Sewer Replacement	Underground storage	Dry pond in Rosedale Park	Dry Pond in Poplar Park	Relief sewer in easement with ravine storage	Relief sewer on roads with ravine storage	Runoff reduction techniques/ flood proofing	Do nothing
Effectiveness	*****	**			*****	****		NA
Natural Environment	**	***	**	***	***	***	****	NA
Cultural, social, economic environments	***	***	**	**	****	**	****	NA
Property effects	***	***	***	***	**	***	***	NA
Cost		*	**	**	***	*	*****	NA
Totals (if effective)	13	12			17	13		
Class EA Schedule	A	A	B	B	C#	C#	A	

#: Construction of a new dam or weir in a watercourse is a Schedule C project.

5.3 Evaluation Rationale

Alternative 1: Storm Sewer Replacement with Larger Diameter Pipe

Concept:

This alternative involves replacing or twinning all undersized storm sewers with larger diameter pipes with more capacity to carry storm water flows. The system would be sized to carry a 10 year design storm before the sewers would begin to surcharge.

Expected Results:

Surface flooding in the study area would be reduced to the recommended frequency by the City's standards. Basement flooding would also be reduced in frequency. Downstream surcharging would increase due to increased flows if the pipe network downstream is not improved to handle the increased flow rate. Improvements would be needed or storage provided downstream along the drainage route to the St. Mary's River.

Challenges:

There would be considerable pipe replacement required along the entire downstream route through the downtown to the sewer system outlet adjacent to the Roberta Bondar Pavilion, at considerable capital costs. Water quality is not enhanced by storm sewer conveyance directly to the St Mary's River.

Alternative 2: Underground Storm Water Storage within Existing Roadways/Easement Corridors

Concept:

This alternative involves the temporary storage of runoff water in underground box culverts or large diameter pipes, (super pipes) releasing it slowly during and after a storm event. Storage could take place along the McNabb or Willow Avenue road allowances, or underground in Poplar Park.

Expected Results:

Surface flooding would be reduced to the recommended frequency by the City's standards if the storage volume provided is adequate and topography allows the overflow to function hydraulically. Basement flooding would also be reduced in frequency. If storage is adequate, downstream flow rates should not increase.

Challenges:

Finding room for the required volume of storage (up to 40,000 cubic metres) in existing roads would be difficult, due to the location and extent of other utilities and services. Locating underground storage in

Poplar Park would be possible, however underground storage for the volumes required, either in a public right of way or a park is very expensive, and depth is controlled by storm sewer elevations.

Alternative 3: Storm Water Management by Creating a Dry Pond in Rosedale Park

Concept:

This alternative involves the temporary storage of runoff water "off line" or away from the storm sewer system. Storage could take place in Rosedale Park by directing excess flows from the Willow Avenue storm sewer into a created bowl in the park. The stored water would drain out slowly, back into the system as the storm event passes. The dry pond storage bowl would be designed with suitable side slopes so the area remains usable for park activities.

Expected Results:

Surface flooding would be reduced to the recommended frequency by the City's standards if the storage volume provided is adequate and topography allows the overflow to function hydraulically. Basement flooding would also be reduced in frequency. If storage is adequate, downstream flows should be reduced. Water quality improvements could also be expected.

Challenges:

Developing a dry pond in a public park may raise concerns by park users. Maintenance in the park will need to be increased following a heavy rain event, to pick up debris. Diverting and storing all flows from the Willow Avenue storm sewer north of Marwayne Avenue would not achieve the required reduction needed to prevent surcharging of the 900 mm diameter storm sewer in the vicinity of the YMCA, when subject to a 1 in 10 year storm event. Some water quality improvements would occur with the proposed storm water management facility.

Alternative 4: Storm Water Management by Creating a Dry Pond in Poplar Park

Concept:

Similar to Alternative 3, this alternative involves the temporary storage of runoff water in Poplar Park, south of Algoma Family Services by directing excess flows from the McNabb Street storm sewer into a created bowl in the park. The stored water would drain out slowly, back into the system as the storm event passes. The dry pond storage bowl would be designed with suitable side slopes so the area remains usable for park activities.

Expected Results:

Surface flooding would be reduced to the recommended frequency by the City's standards if the storage volume provided is adequate and topography allows the overflow to function hydraulically. Basement

flooding would also be reduced in frequency. If storage is adequate downstream flows should not increase. Water quality improvements can be expected with the proposed storm water management facility.

Challenges:

Developing a dry pond in a public park may raise concerns by park users. Maintenance in the park will need to be increased following a heavy rain event, to pick up debris and maintain the inlet. The pond would need to be quite deep, to function hydraulically, so safe side slopes would be difficult to achieve. The relatively narrow width of the park corridor limits possible designs, and limits storage volumes. Adequate capacity to retain water from large storm events is not available.

Some water quality improvements would occur with the proposed storm water management facility but are inherently more difficult to achieve. Meeting MOECC improvement levels for Total Suspended Solids (TSS) removal would be difficult.

Alternative 5: Provide Increased Capacity in the Pipe Network South of McNabb Street Along the Current Storm Sewer Alignment to the Ravine Outlet and Create a Temporary Storage/Stormwater Management Facility in the Ravine System

Concept:

This alternative involves the construction of additional conveyance capacity by installing another storm sewer from McNabb Street southerly through to the ravine outlet (in combination with some pipe replacement and/or repair near the Pim Street outfall as described in Section 1.5) or by replacing the sewer completely. A new parallel sewer could be shallower (2 - 4 m deep) if installed as a relief sewer taking flows only when the deeper sewer surcharges. Alternatively, a completely new sewer could be installed, and the existing one removed.

The ravine west of Pim Street would be used to store excess flows through the construction of a dam or weir, in order to avoid increases in downstream flow and flooding occurrences.

Expected Results:

Surface flooding would be reduced in the study area to the recommended frequency by the City's standards. Basement flooding risk would also be reduced for basements subject to basement inflow from surcharged sewers. Downstream surcharging would not increase due to the temporary storage in the ravine. Depending on the weir design and storage volume provided, downstream flooding south of MacDonald/Trelawne could be substantially reduced as well, benefiting the downtown. Water quality improvements would occur with the proposed storm water management facility by implementing one or more industry standard techniques.

Challenges:

Constructing a relief sewer above and parallel to the deep existing sewer presents difficulties. The ravine was filled with imported materials, and the easement is only 6 m wide. The new pipe would need to be bedded in original material or on engineered fill. The alternative, complete replacement of the existing storm sewer would also be a challenge given the depth and soils in the former ravine.

The ravine west of Pim Street is a natural ravine, with some steep side slopes and covered in mature vegetation and trees. Incorporating occasional water storage by building a control structure near Gladstone Avenue presents challenges to the natural environment. The properties affected are not City owned for the most part (mostly owned by school boards).

Installation of new sewer infrastructure in the parking lot areas of 410 Pim Street (Canadian Motor Hotel) will reduce parking lot capacity during the construction period, and be disruptive to the hotel and its patrons. However, as noted in Section 1.5 “Structural Issues in Existing Sewer” considerable sewer replacement and/or repair is required on the sewer systems crossing the Canadian Motor Hotel property regardless of the alternative solution chosen for the McNabb Street flooding issue.

Alternative 6: Provide Overflow Capacity by Constructing Relief Sewers on McNabb Street and Pim Street to the Ravine Outlet, and Create a Temporary Storage/Stormwater Management Facility in the Ravine System.

Concept:

This alternative involves the construction of additional conveyance capacity by installing another storm sewer (or upsizing existing) along McNabb Street westerly to Pim Street and then southerly to the ravine outlet (in combination with some pipe replacement and/or repair near the Pim Street outfall as described in Section 1.5) As the ravine sewer surcharged above its 5 m depth at McNabb St, it would overflow into the relief sewer. Additional capacity would thus be added, as excess flow would be conveyed to the ravine outlet using additional storm sewer capacity on road allowances.

Expected Results:

Surface flooding would be reduced in the study area to the recommended frequency by the City’s standards. Basement flooding risk would also be reduced for basements subject to basement inflow from surcharged sewers. Downstream surcharging would not increase due to the temporary storage in the ravine. Depending on the weir design and storage volume provided, downstream flooding south of MacDonald/Trelawne could be substantially reduced as well, benefiting the downtown. Water quality improvements can be made as well.

Challenges:

Installing new large diameter sewers as a relief sewer on McNabb Street and Pim Street would be expensive due to the road restoration requirements, and interference with other underground sewers and utilities. It would also be disruptive to local businesses and road users and is not the natural overland flow route. Repair and/or future replacement of the existing 54 year old sewer would still need to be undertaken in the future. And as noted in Section 1.5 “Structural Issues in Existing Sewer”, considerable sewer replacement and/or repair is required on the sewer systems crossing the Canadian Motor Hotel property.

The ravine is a natural ravine, with steep side slopes and covered in mature vegetation and trees. Incorporating occasional water storage by building a control structure near Gladstone Avenue presents challenges to the natural environment. The properties affected are not municipally owned for the most part.

Alternative 7: Peak Flow/Runoff Reduction Techniques with an Emphasis on Flood Proofing

Concept:

This alternative involves the use of more passive methods to reduce the amount of flow in the sewer system by infiltrating it into the ground as much as possible or reducing the peak flow in the sewer by spreading out the runoff over a longer period of time. Methods include: roof top and parking lot temporary storage; disconnecting roof leaders from the sewer system; disconnection of weeping tile and using sump pumps with splash pads, inlet controls on catchbasins, use of rain barrels, perforated pipes etc.

Emphasis would also be put on ensuring basements are flood proofed and that excess water is infiltrated into the ground.

Expected Results:

Surface flooding would be reduced somewhat by the successful reduction of storm water flow volumes either by delaying storm runoff or increasing infiltration. Surface flooding at road sag points would be increased by the use of inlet controls on catchbasins.

Challenges:

Obtaining satisfactory results and acceptance of above normal periodic street flooding would be a challenge. When saturated or frozen ground conditions exist, excess water doesn’t infiltrate into the ground, becoming overland flow. Surface flooding at road sag points would be increased by the use of inlet controls on catchbasins. It is expected peak flows in the sewer would not be reduced substantially nor would instituting these methods on private property be easy. It would need to be voluntary, unless bylaws were changed and enforcement took place. Roof top and parking lot storage is generally

incorporated in new development and not as a retrofit. Because of the cost associated with retro fitting existing development, it is difficult to obtain substantial flow reduction by voluntary means.

ALTERNATIVE 8: DO NOTHING

Concept:

No measures are proposed to mitigate the existing surface and building flooding problems.

Expected Results:

No change to current flooding risks and frequency of occurrences. This alternative represents baseline conditions and its evaluation is required by the Municipal Class EA process. It is not preferred since the identified problems are not addressed.

6 CONSULTATION – PUBLIC OPEN HOUSE #1

A Public Open House was conducted to consult with the public and interested parties on January 15, 2014. Notice was published in the Sault Star January 4 & 11 2014 and placed on the City website. The notice was also mailed to all residents and other interested parties on the contact list including Garden River First Nation, Batchewana First Nation, Métis Nation of Ontario, Sault Ste Marie Regional Conservation Authority, EA Coordinator Ministry of the Environment, and Ward 2, 3 and 4 City Councillors.

A summary of the open house and copies of all written comments received can be found in Appendix 3.

6.1 PREFERRED SOLUTION

Following input from the open house and based on the evaluation results it was concluded that Alternative #5 is the preferred solution, which involves temporary ravine storage of excess flows by creating a storm water management pond in the ravine west of Pim Street, in combination with increased capacity in the storm sewer system south of McNabb St, through Poplar Park and the Canadian Motor Hotel's parking lot.

6.2 REVISED EA SCHEDULE

In Section 2.1.4, the initial assessment placed the project into a Schedule B. Given that the construction of a dam or weir across a water course is considered a Schedule C activity under the Municipal Class EA documents, the project was considered under Schedule C.

6.3 Expanded Study Area

As noted previously, consideration of the ravine for storage required the expansion of the initial study area, since the initial area did not include the ravine west of Pim Street. The revised study area limits are shown in Figure 2. The owners of properties in the expanded area were added to the contact list.

PHASE 3: ALTERNATIVE DESIGN CONCEPTS FOR THE PREFERRED SOLUTION

7 Design Alternatives

7.1 Identification of Alternative Design Concepts for the Preferred Solution

There are several design concepts for Alternative 5 that address the problem statement i.e. to reduce the frequency of flooding in the McNabb Street/Pim Street and Willow Avenue areas. Alternative designs focused on:

1) Increasing storm sewer capacity to the City standard 10 year storm frequency from the junction of the Willow Avenue 1050 mm storm sewer and the McNabb Street 900 mm storm sewer, located in a maintenance hole in front of 205 McNabb Street (Algoma Family Services), to the outlet into the ravine south of 415 Pim Street (Great Lakes Honda)
2) Converting the natural ravine west of Pim Street to a storm water management facility. In keeping with the City's storm water management guidelines, a dry pond (retention pond) would be created, and all stored water would drain away over a period of time. Outflow would be regulated by means of a control structure adjacent to the Gladstone Avenue road crossing.

The preferred solution is based on increasing the storm sewer capacity south of McNabb Street. There are two alternative conveyance improvement designs that were considered:

Alternative Conveyance Design Concept #1

This alternative involves the construction of a relief sewer of suitable diameter in the existing easement across the Algoma Family Services parking lot, Poplar Park, and the Canadian Motor Hotel parking lot, across Pim Street, to the ravine outlet. It is anticipated the sewer would be 900 – 1050 mm in diameter, and could be placed 2-4 m deep, offset in an easement from the deeper existing 900 mm storm sewer. Easements much wider than the current 6 m would be needed from private property owners.

Alternative Conveyance Design Concept #2

Rather than constructing a parallel relief sewer along the Poplar Park sewer corridor, the existing 900 mm sewer could be replaced with a new sewer of larger diameter. There are benefits of having only one pipeline in the corridor, and although the existing sewer appears structurally adequate in the CCTV video footage, it is approximately 54 years old. Its future replacement would be made more difficult by

the existence of a shallower relief sewer adjacent to it, in the same utility corridor. The former ravine has been filled with potentially poor quality material so founding a large diameter pipe at a higher elevation may be extremely challenging.

It is also noted that either of these conveyance improvements should be done in conjunction with necessary additional pipe repairs/replacement as identified in Section 1.5 “Structural Issues in Existing Sewer”.

There are also two alternative ravine storm water management improvement designs that were considered:

Alternative Storage Design Concept #1

This alternative involves construction of an outlet control structure near Gladstone Avenue that allows normal volumes to pass and drain southerly, but retains above normal flows up to the City’s 1 in 10 year design storm frequency, then releasing the excess over a period of time, once the storm event/snow melt has subsided. Water quality can be improved within the design process due to the natural settling of suspended material in the ponds.

Alternative Storage Design Concept #2

This alternative includes building an outlet control structure near Gladstone Avenue that allows normal volumes to pass and drain southerly, but retains above normal flows up to the City’s 1 in 100 year design storm frequency then releasing the excess over a period of time, once the storm event/snow melt has subsided. Water quality improvements would also be incorporated in the design process.

7.2 Detailed Inventory of the Natural, Social and Economic Environments

7.2.1 Social and Economic Environments

See Section 3.2.4.

7.2.2 Natural Environment

A review and inventory of the natural environment was completed by Tulloch Environmental in September 2014. The report “Natural Environment: Existing Conditions & Impact Assessment - McNabb Stormwater Management Ravine Diversion”.

In reference to the ravine, the report concludes:

“*A background records review and site investigation were conducted to obtain information on the existing natural features in and around the study area.*

The SSMCA noted that the area and proposed work would fall under the Development, Interference with Wetlands and Alteration to Shorelines and Watercourse Regulation O. Reg. 176/06. A permit will be required for the installation of the outlet control structure.

No SAR (Species at Risk) or rare wildlife were identified within the study area. It is highly recommended that construction be avoided during the migratory bird breeding period (beginning of April- End of August). A minimal loss of wildlife habitat is expected due to the proposed work.
Some loss of vegetation will occur due to the construction of the outlet control structure and the associated retention of storm water; however all of the identified species were either non-native or common throughout the area. Several aggressive invasive species were identified to occur within the study area and the area of proposed work. It is highly recommended that the mitigations provided in Section 6 are implemented to prevent the further spread of these species.

The McNabb Street storm water management ravine diversion is expected to result in primarily short term impacts to environmental resources. No significant residual effects are expected, provided the mitigation measures in Section 6 are implemented.

The observations and results obtained during these investigations are representative of the conditions encountered during the 2014 site visit. Many species are migratory and may occur within the area during some years and not others. Habitat (vegetation communities) also changes over time and may become more or less suitable for SAR. Tulloch has used its best professional judgment to interpret the site investigation observations along with the background information and provided accurate conclusions."

The mitigation and protection measures outlined in the report are discussed below.

7.2.3 Archaeological Assessment - Cultural Environment

A Stage 1-2 archaeological assessment was conducted by Horizon Archaeological Inc. to document the cultural heritage significance of the proposed retention pond area and surrounding natural ravine. It is attached in Appendix 5. The report was forwarded to the Ministry of Tourism, Culture and Sport for review and entry into the Ontario Public Register of Archaeology Reports.

The Stage 1-2 archaeological assessment was conducted on September 3, 2014 in accordance with the Ontario Heritage Amendment Act and the Standards and Guidelines for Consultant Archaeologists.

In summary, based on the information gathered, Horizon Archaeological Inc. concluded that the area requires no further assessment.

7.2.4 Potential Impacts of the Alternative Design Concepts and Ways to Mitigate

Alternative Conveyance Design Concept #1

This alternative involves the construction of a relief sewer of suitable diameter in the existing easement across the Algoma Family Services parking lot, Poplar Park, and the Canadian Motor Hotel parking lot, across Pim Street, to the ravine outlet. It is anticipated the sewer would be 900 – 1050 mm in diameter, and could be placed 2-4 m deep, offset in the easement from the deeper existing 900 mm storm sewer. As a relief sewer, its primary function would be to convey storm water flows once the existing sewer has

surcharged. A wider easement from private property owners would be needed. Based on the limited width of property extending south from McNabb Street between the YMCA and the Algoma Family Services buildings, a replacement sewer rather than a twinning would be preferable for the first 100 m of pipe.

The environmental impact of sewer construction in an urban setting is predictable. Standard construction techniques would be used and environmental impacts can be mitigated through best practices. Best practices should be used to determine excavation methods, shoring techniques and the need for soil disposal versus reuse. Given the unknown materials used to fill the former ravine, soils unsuitable for reuse may be encountered.

Alternative Conveyance Design Concept #2

This alternative involves constructing a completely new sewer along the Poplar Park sewer corridor, (across the Algoma Family Services parking lot, Poplar Park, and the Canadian Motor Hotel parking lot, across Pim Street, to the ravine outlet) replacing the existing 900/1050 mm sewer with a new sewer of larger diameter (assumed 1500 mm).

The environmental impact of this design is also predictable and standard construction techniques would be used and environmental impacts can be mitigated through best practices. Best practices should be used to determine excavation methods, shoring techniques and the need for soil disposal versus reuse. Given the unknown materials used to fill the former ravine, soils unsuitable for reuse may be encountered.

A narrower corridor would be needed for this alternative compared to two parallel offset pipes.

Alternative Storage Design Concept #1

This alternative involves construction of an outlet control structure near Gladstone Avenue that allows normal volumes to pass and drain southerly, but retains above normal flows up to the City's 1 in 10 year design storm frequency, then releasing the excess over a period of time, once the storm event/snow melt has subsided. Water elevations behind the control structure can be expected to be approximately 4 m deep during a 1 in 10 year rainfall event, and temporarily flood the westerly end of the ravine, covering existing vegetation. It is noted this is occurring now during major rainfall events due to debris accumulation and box culvert deterioration at the Gladstone Avenue crossing.

View of flooded ravine November 17, 2013 taken just west side of Gladstone Avenue

As noted in the September 2014 Natural Environment: Existing Conditions & Impact Assessment Report: "*The McNabb Street storm water management ravine diversion is expected to result in primarily short term impacts to environmental resources. No significant residual effects are expected, provided the mitigation measures in Section 6 are implemented.*"

Mitigation strategies for vegetation and wild life are detailed in the report. They include minimizing vegetation removal and restoring native vegetation where appropriate that is resistant to seasonal flooding. Due to the presence of several aggressive invasive species, efforts should be taken to control their spread when work is performed in the ravine. This includes cleaning equipment/tools, limiting the use of tracked machinery and keeping excavated materials on site.

When the project is being designed and tendered, emphasis should be made to minimize the work done in the ravine itself. This may be possible by keeping the control structure as close to Gladstone Avenue as possible. The required permit from the Sault Ste Marie Region Conservation Authority may also include requirements to minimize/mitigate impacts.

To mitigate effects on wildlife, any required clearing should take place outside of the migratory bird nesting season, and construction should also take place outside of the nesting season if possible (April to end of August). Detailed mitigation strategies as outlined in the appended report should be referenced during engineering design, and incorporated into tender documents.

Alternative Storage Design Concept #2

This alternative includes building an outlet control structure near Gladstone Avenue that allows normal volumes to pass and drain southerly, but retains above normal flows up to the City's 1 in 100 year design storm frequency, then releasing the excess over a period of time, once the storm event/snow melt has subsided. Water elevations behind the control structure can be expected to be 6 - 6.5 m deep during a 1 in 100 year rainfall event, or 2 – 2.5 m deeper than during a 10 year event. The environmental impacts of this design would be similar to Design #1. The affects of the additional water being stored (very infrequently) is minor, particularly when compared to the impact a 1 in 100 year storm event would have flowing downstream from Gladstone Ave, through the downtown area. Mitigation strategies are as detailed for Storage Design #1.

7.2.5 Evaluation of Conveyance and Storage Design Concepts

Evaluation of conveyance and storage design concepts involves balancing several factors:

- technical feasibility and effectiveness;
- impacts on the natural environment;
- impacts on the cultural, social and economic environments;
- effects on private and public property; and,
- financial costs.

7.2.5.1 Preferred Conveyance Design Concept

Of the two alternative conveyance designs, replacing the undersized sewer south of McNabb Street to the ravine outlet with a larger sewer capable of conveying a 1 in 10 year rainfall event is the preferred concept. The primary reason concerns the technical difficulties anticipated with excavating in the fill material that was used to fill the former ravine in, after the 900 mm pipe was placed in the bottom. Poor quality soil from various sources including construction fill from road excavations, and building demolitions is suspected, and it appears settlements have been occurring over the past 54 years along various sections of the former ravine, possibly indicating organic material (trees, wood) may also be present. It would be technically challenging to excavate for a relief sewer adjacent to, but higher (2-4 m) than the existing 900 mm sewer. The new sewer would need to be founded on a solid base, which may prove difficult. Alternatively it would need to be placed at the same elevation as the existing. A comprehensive geotechnical study will need to be conducted prior to design work.

In addition, the deeper 54 year old sewer will need to be maintained and eventually replaced. It would be cost prohibitive to support the newer relief sewer while repairing or replacing the older one.

Parallel sewers would also require wider easements (permanent and for construction), increasing the impacts on private property (Algoma Family Services, Canadian Motor Hotel).

The impacts on the natural environment were judged to be very similar for either design concept.

Financially, both alternatives are estimated to be relatively close in cost, but the replacement alternative will give a superior result.

7.2.5.2 Selection of Preferred Storage Design Concept

The preferred storage design involves building a control structure at Gladstone Avenue to retain up to a 1 in 100 year rainfall event. The differences in water elevations, construction costs and environmental impacts are relatively minor when compared to the downstream benefits of retaining runoff from future storm events with an expected frequency of between 1 in 10 and 1 in 100 years. The added benefit includes water quality improvements. Currently there are limited quality improvements taking place for this drainage system.

A plan view of the preferred solutions can be found in Figure 4.

8 Consultation – Public Open House #2

A Public Open House was conducted to present the preferred alternatives and to consult with the public and interested parties on November 12, 2015. Notice was published in the Sault Star on October 31st and November 7th, 2015 and placed on the City website. The notice was also mailed to all residents and other interested parties on the contact list including Garden River First Nation, Batchewana First Nation, Métis Nation of Ontario, Sault Ste Marie Regional Conservation Authority, EA Coordinator Ministry of the Environment, and Ward 2, 3 and 4 City Councillors.

A summary of the open house, the public notice, information bulletin and copies of all written comments received can be found in Appendix 6. Previous comments from the MNR and SSM Region Conservation Authority have also been brought forward (See Tulloch Natural Environment Report in Appendix 4).

9 Monitoring

Monitoring will be required, both during the construction phase and while the facility and sewer systems are in operation.

Construction Activity

The Natural Environment: Existing Conditions & Impact Assessment Report (Appendix 4) outlines mitigating measures to protect terrestrial and wildlife concerns during construction. Best practices should also be incorporated to address erosion and sedimentation potential and negative impacts on water quality during construction. Typical mitigation measures should address refueling and maintenance, traffic control, disposal of excavated material, sensitive areas, silt and dust control, site

clearing and noise. Tree cutting should be minimized, and all temporary erosion and sediment controls should be inspected on a regular basis throughout the project.

Operation and Maintenance

Maintenance is an important part of an urban stormwater management system. Means to protect the environment should be incorporated into the designs to facilitate future maintenance activities. The following is an outline of the principal operation and maintenance activities that should be undertaken on an ongoing, scheduled basis:

- Inspection and cleaning of catch basin and manhole sumps in the sewer system, as per the municipal storm sewer maintenance policy.
- Inspection of inlets and outlet for the stormwater management facility and debris removal as required.
- Inspection of stream bed for erosion along the open water course.
- Maintenance of vegetation around the facility.
- Review accumulated sediment and periodic removal of sediments with appropriate Public Works staff and equipment .

10 APPROVALS

Implementation of the preferred alternatives will be subject to the receipt of all necessary approvals. Following City Council approval of the project and budget approval, two other formal approvals will be required:

Conservation Authorities Act

Implementation of the stormwater management facility in the natural ravine west of Pim Street will require Sault Ste. Marie Region Conservation Authority approval under Ontario Regulation 176-06. An application will need to be submitted. The application will define measures to protect sensitive lands during construction in order to minimize the negative impacts of the project on the natural features of the area. Site restoration and any post construction enhancements to disturbed areas will also be presented.

Ontario Water Resources Act

Construction of storm sewers and stormwater management facilities are subject to the Ontario Water Resources Act. Consequently, the project will require an Environmental Compliance Approval from the MOECC.

11 PRELIMINARY COST ESTIMATES FOR PREFERRED DESIGNS

The preferred designs have a preliminary cost estimate of $5,156,000, including contingencies, and allowance for utility relocations, and engineering costs. The detailed cost estimate is found in Appendix 7.

12 CONCLUSION

The preferred solution to address the flooding issues outlined in this study consists of two recommended City initiated capital works projects:

- The replacement of the undersized storm sewer south of McNabb Street through to the ravine outlet west of Pim Street with a larger sewer capable of conveying a 1 in 10 year rainfall event.

- The construction of a storm water management facility in the natural ravine between Gladstone Avenue and Pim Street to retain up to a 1 in 100 year rainfall storm event.

In addition to the construction of these storm water conveyance and storage facilities, it is recommended that private property owners continue to flood proof buildings in the study area through the various techniques described.

PHASE 4: ENVIRONMENTAL STUDY REPORT

13 NOTICE OF STUDY COMPLETION AND PROVISION OF ENVIRONMENTAL STUDY REPORT FOR PUBLIC REVIEW

The completion of this Environmental Study Report (ESR) and filing of the Notice of Study Completion concludes the Class EA process for this project. The ESR is made available to the public for review upon request for thirty (30) calendar days. If concerns regarding the project cannot be resolved in discussion with the City of Sault Ste Marie, a person or party may request that the Minister of the Environment and Climate Change make an order for the project to comply with Part II of the *Environmental Assessment Act* (referred to as a Part II Order), which requires an Individual Environmental Assessment. Requests must be received by the Minister within the 30-day review period. If no new or outstanding concerns are brought forward during the review period, the City may complete detailed design and construction of the project.

14 REFERENCES

City of Sault Ste Marie 2015 Stormwater Master Plan and Policy

City of Sault Ste Marie Official Plan 1996, Amended 2003, City website November 2012

City of Sault Ste Marie Sewer Use Bylaw 4440/Bylaw 2009-50

Geotechnical Study, City of Sault Ste Marie; The Trow Group, January 1977

Ministry of Transportation Drainage Management Manual, Drainage and Hydrology Section, Transportation Engineering Branch, MTO 1995-1997.

Municipal Engineers Association, Municipal Class Environmental Assessment, October 2000, as amended in 2007 and 2011.

Ontario Building Code Act 1992 as amended, www. Ontario.ca

Ontario Ministry of the Environment, 2003 Stormwater Management Planning and Design Manual

Proctor and Redfern, City of Sault Ste Marie Drainage Report, December 1965

Storm Sewer Capacity Analysis and Condition Assessment, Pim Street/McNabb Street Watershed, January 2013, Tulloch Engineering

Visual OTTHYMO V 3.0

HY-8 Culvert Analysis V 7.30

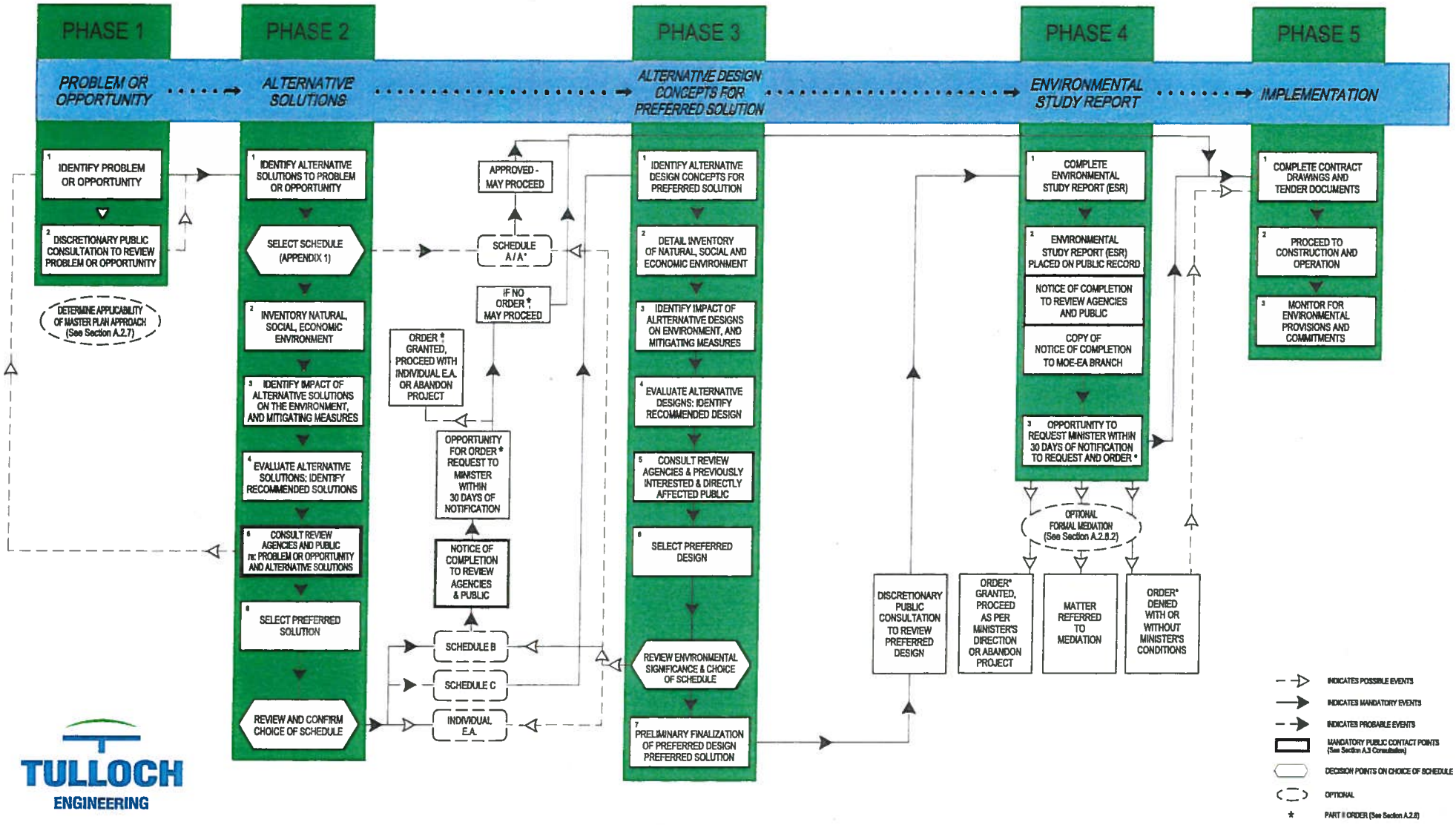
APPENDIX 1

Municipal Class EA Planning Process Flow Chart

EXHIBIT A.2

MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA



TULLOCH ENGINEERING

APPENDIX 2

Published/Mailed Notice of Commencement

Notice of Study Commencement

Flooding in the McNabb Street and MacDonald Avenue Areas

McNabb Street Area Storm Drainage Review
Class Environmental Assessment Study #1

The City of Sault Ste Marie has initiated a Class Environmental Assessment (EA) to review the storm water drainage system in the vicinity of McNabb Street, Pim Street and Willow Avenue. The intent of the study is to determine the preferred method of reducing the frequency of local flooding in the lower Willow Avenue, McNabb Street and upper Pim Street areas.

MacDonald Avenue Area Storm Drainage Review
Class Environmental Assessment Study #2

The City has also initiated a Class Environmental Assessment (EA) to review the storm water drainage system in the MacDonald Avenue area, east of Pim Street. The intent of this study is to determine the preferred method of reducing the frequency of local flooding on MacDonald Avenue between Poplar Avenue and Alworth Place.

The Process
These studies are being carried out in accordance with the planning and design process as outlined in the Municipal Engineers Association *Municipal Class Environmental Assessment* (2000, as amended in 2007) document. They will define the problems in both areas, identify and evaluate alternative solutions and determine a preferred solution in consultation with the public, the City and regulatory agencies.

A key component of the study will be consultation with interested stakeholders (public and review agencies). Public Information Centres (PICs) will be held as the studies proceed, at a location and date to be announced, to gather public input, and then to present the information gathered, an evaluation of alternative solutions, an assessment of impacts of proposed undertakings and identification of reasonable measures to mitigate any adverse impact. Upon completion of the studies, two individual Project Files with recommendations will be prepared for public review and comment.

How to Get Involved

Public consultation is invited. The City wants to ensure that anyone interested in either of these studies has the opportunity to get involved and provide input before any decisions are made on future corrective action. To get involved in the study you can contact us at any time to express your interest and/or be added to the study contact list, or interested persons can attend the Public Information Centres once scheduled. All property owners in the immediate study areas have been placed on the contact list already. ***Further details regarding the PICs including the times and locations will be advertised and mailed to those on the contact list in a subsequent notice, in the coming months.***

For more information, please contact:

Pat McAuley P. Eng.
Tulloch Engineering
71 Black Rd Unit 8
Sault Ste Marie ON.
P6B 0A3
Phone (705) 949 1457
pat.mcauley@tulloch.ca

Don Elliott, P. Eng.
City of Sault Ste. Marie
99 Foster Drive
Sault Ste. Marie, ON
P6A 5X6
Phone (705) 759-5329
d.elliott@cityssm.on.ca

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.

APPENDIX 3

Public Open House #1 Information

Notice of Public Information Centre

Flooding in the McNabb Street and MacDonald Avenue Areas

McNabb Street Area Storm Drainage Review
Class Environmental Assessment Study #1

The City of Sault Ste Marie has initiated a Class Environmental Assessment (EA) to review the storm water drainage system in the vicinity of McNabb Street, Pim Street and Willow Avenue. The intent of the study is to determine the preferred method of reducing the frequency of local flooding in the lower Willow Avenue, McNabb Street and upper Pim Street areas.

MacDonald Avenue Area Storm Drainage Review
Class Environmental Assessment Study #2

The City has also initiated a Class Environmental Assessment (EA) to review the storm water drainage system in the MacDonald Avenue area, east of Pim Street. The intent of this study is to determine the preferred method of reducing the frequency of local flooding on MacDonald Avenue between Poplar Avenue and Alworth Place.

The Process
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A key component of the study will be consultation with interested stakeholders (public and review agencies). A Public Information Centre (PIC) will be held:

Wednesday January 15, 2014

in the Thompson Room - Civic Centre

from 3:00 p.m. to 7:00 p.m.

Consultants and municipal staff will be available to discuss the drainage issues in the two study areas, and get input from interested parties on possible solutions.

The public is invited on a come and go basis between 3 p.m. and 7 p.m. to visit and provide input or have questions answered.

A second PIC will be scheduled to present findings once all potential solutions have been evaluated in both study areas and preferred solutions are determined.

Upon completion of the studies a Project File will be prepared for each project for public review and comment.

For more information, please contact:

Pat McAuley P. Eng.
Tulloch Engineering
71 Black Rd Unit 8
Sault Ste Marie ON.
P6B 0A3
Phone (705) 949 1457
pat.mcauley@tulloch.ca

Don Elliott, P. Eng.
City of Sault Ste. Marie
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d.elliott@cityssm.on.ca

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.

McNabb St and MacDonald Ave Environmental Assessment Studies

Public Information Centre

Wednesday January 15, 2014

Thompson Room Civic Centre 3:00 p.m. to 7:00 p.m.

Please Sign In:

NAME	ADDRESS	PHONE	EMAIL ADDRESS
DAVE MURPHY	9 ALWORTH PLACE		
Yvonne M. Bacon	250 McNabb		
[illegible]	10 MacDonald		
Kim Caruso	235 McNabb		
FRANK KIZZO	240 McNABB		
Tim Gowing	191 POPLAR AVE		
SEV + TIM LANTHIER	208 MACDONALD AVE		
Jason Bertrim	642 Great Northern Road		
M McQuaid	35 FOREST AVE		
Pat Mick	50 Cory Ave		
BRIAN WATKINS	54 CHURCHILL		
ROBERT RATTLE			
[illegible]	225 MACDONALD AVE		

Please Sign In:

NAME	ADDRESS	PHONE	EMAIL ADDRESS
DAVID SHNA	213 MACDONALD AVE	705-942-0867	deb-dave.sparks@
GORD DION	3 WELDON AVE	705-949-3745	Sympatico.ca.
Paul & Heather McDonald.	166 Brian Ave.	705-575-7687	~~Dmcdonald@c~~ paulmcdonald@gmail.com

TULLOCH ENGINEERING

71 Black Road
Unit 8
Sault Ste. Marie, ON
P6B 0A3

T. 705 949.1457
F. 705 949.9606
TF. 866 806.6602
saultstemarie@TULLOCH.ca
WWW.TULLOCH.ca

McNabb Street & MacDonald Avenue Environmental Assessments
Public Open House #1
Wednesday January 15, 2014
Thompson Room Civic Centre

Thank you for attending today's open house concerning the flooding issues in the McNabb St and the MacDonald Ave areas.

Your comments or questions are appreciated and will be incorporated into the project file and final recommendations to the City of Sault Ste Marie. All questions will be responded to if contact information is provided (address and/or email).

Primary Area of Interest: McNabb St Study Area [X]
MacDonald Ave Study Area [ ]

Comments/Questions?

1. Appreciated the opportunity to be able to participate and exchange information

2. Looking forward to your 2nd follow up meeting at which time you plan to share your solutions.

Pierrette M. Brosch

Pierrette M. Brosch

TULLOCH ENGINEERING

Structural Civil & Municipal Contract Administration Environmental Geotechnical Mechanical & Electrical Inspection & Testing

Public Information Centre McNabb St and MacDonald Ave Environmental Assessments

January 15, 2014, 3:00 p.m. to 7:00 p.m.

Thompson Room - Civic Centre

Representatives in attendance:

City of Sault Ste Marie representatives: Don Elliott, 3:00 p.m. to 7:00 p.m.

Carl Rumiel, 3:00 p.m. to 6:30 p.m.

Tulloch Engineering representatives: Pat McAuley, 3:00 p.m. to 7:00 p.m.

John McDonald, 3:00 p.m. to 7:00 p.m.

Public participation:

Public attendance: 18 people signed in on sign in sheet (attached)

2-3 people declined to sign in, but reviewed info/took handouts

Information material on walls and tables:

Drainage areas outlined on air photos for both study areas

Photos of November 17th flooding in both areas

1958 compiled drawing of topographic information, showing ravine system before filling

Drainage Area maps showing all property lines

Plan and profile drawings from 2012 study, showing hydraulic grade line from 2 year event

Municipal Class E.A document

Copies of "Storm Sewer Capacity Analysis and Condition Assessment" reports for both study areas, completed in 2012

List of Alternatives with concepts/expected results as handouts and in an 11x17 format

Sign in sheets, comment sheets

71 Black Road, Unit 3
Sault Ste. Marie, ON
P6B 0A3
www.tulloch.ca

Phone: (705) 949.1457
Fax: (705) 945.5092
saultstemarie@tulloch.ca

Summary:

Discussion took place with most visitors concerning the extent of the drainage problems, and their perspectives with regard impact on their homes or businesses. The wall mounted photos of the November 14, 2013 flooding were of great interest and started discussion. The general intent of the open house was to obtain information from property owners as to their perspective on the drainage issues, and explain the various alternatives that will be explored in the EA process. Everyone was asked to take a comment/question sheet and either fill it out that night, or to take it with them and return it (mail or emailed comments) to either Don Elliott or Pat McAuley.

Questions and area of interests were split between the two study areas. Two elected councillors from the City attended.

Various comments/ issues that were raised:

- Group Health Centre has done considerable work flood proofing their building after several major basement flooding events. MET Engineering (Tim Janzen) provided them the expertise on protecting the basement from both sanitary and storm water entry into the basement.
- the Sept 10 rainfall event caused some minor flooding possibly due to a failed check valve
- A lateral drain from the building has been installed and drains westerly to the 1050 storm sewer on an easement along the west side of the GHC property
- GHC would consider allowing underground storage on their property, in the vicinity of the depression to the north west

- A number of residents (on MacDonald Ave, Brien Ave, and Weldon Ave) experienced basement flooding in 2013 from sanitary sewer backups. The purpose of these EAs was explained to them (addressing storm sewer issues). Discussions then took place on ways to flood proof their homes from sanitary sewer backups, by following the schedules in the Sewer Use Bylaw. The installation of sump pumps for weeping tile water, and the use of check valves was explained a number of times to residents with recommendations to talk with a plumber.

- Concerns were raised with the use of the ravines in Penhorwood Park for temporary storage. Standing water in a park, and concerns with children's safety was raised as well as the use of the ravines for winter sledding. It was suggested that storage would be better if the ravine on the south side of MacDonald was used instead, south towards Ontario Avenue. This will be added to the options to be explored for the MacDonald Ave E.A. to see if it is feasible.

71 Black Road, Unit 3
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P6B 0A3
www.tulloch.ca

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- It was also suggested that if storm sewers are replaced on MacDonald Ave that they be upsized, to ensure they do not continue to surcharge – that the cost of oversize piping would be minimal

- The centreline crown elevation on MacDonald Ave should be checked. Would it be possible to allow for better overland flow down the street if the crown was lowered?

- It was noted that the intersection of Montgomery Avenue and Brien Ave floods with heavy rainfall. The basins don't seem to be able to take the flow

- It was pointed out the backyards of the neighbourhoods north of MacDonald Ave all have rear yard drainage along the common property lines, draining south to inlet basins near the MacDonald Ave sidewalk. This swale and the basins need to be kept clear of leaves and debris.

- The catchbasins on MacDonald Ave were affected by leaf accumulation during the recent flooding, and changing the basins to side inlets would be beneficial

PMc

16/01/2014

71 Black Road, Unit 3
Sault Ste. Marie, ON
P6B 0A3
www.tulloch.ca

Phone: (705) 949.1457
Fax: (705) 945.5092
saultstemarie@tulloch.ca

Pat McAuley

From: Tony Greco [
Sent: Friday, May 23, 2014 9:00 AM
To: Don Elliott
Cc: Terry Joseph; Larry Girardi; Pat McAuley; Carl Rumiel
Subject: RE: Flooding issue Mcnabb St.

My assumption is that my roof drains connect to the storm drain catch basin on McNabb and that drains into the ravine which is 90% blocked . If this is true then its logical to assume that my drains are backing up due to poor flow.
The ravine drain should be unblocked anyway .

Looks like someone is out there now so I thank you for the fast response .

From: Don Elliott [mailto:d.elliott@cityssm.on.ca]
Sent: Thursday, May 22, 2014 4:19 PM
To: Tony Greco
Cc: Terry Joseph; Larry Girardi; 'Pat McAuley'; Carl Rumiel
Subject: RE: Flooding issue Mcnabb St.

Hello Tony: Per e-mail below Public Works will be addressing the grate in the ravine. I am unclear as to how the blocked drain is preventing the roof from draining – maybe I just misunderstand. By copy of this e-mail, I am asking Dan Perri of our office to meet with you on site to discuss this. He will contact you very soon.

Regards,
Don Elliott

From: Larry Girardi
Sent: Thursday, May 22, 2014 9:24 AM
To: 'Pat McAuley'
Cc: Don Elliott; Terry Joseph
Subject: RE: Flooding issue Mcnabb St.

Pat,
Steve Bringleson and I spoke of this issue a couple of weeks ago. It's too bad the grate wasn't hinged from the top thus allowing it to release under load. No worries we will address it very soon.

Lg

From: Pat McAuley [mailto:pat.mcauley@tulloch.ca]
Sent: Thursday, May 22, 2014 8:24 AM
To: Larry Girardi
Cc: Don Elliott
Subject: FW: Flooding issue Mcnabb St.

Hello Larry:

Could you have this outlet grate cleaned? It is on the south side of McNabb, west of Pim, across from Blake St. Looking at the photo, it looks like it may be the wrong type of grate. If a grate is needed at all, it should have only horizontal bars across the opening I suggest. I think OPSD has some examples for grates.

Pat

From: Tony Greco .com]
Sent: Wednesday, May 21, 2014 4:00 PM
To: d.elliott@cityssm.on.ca
Cc: Pat McAuley
Subject: RE: Flooding issue Mcnabb St.

Gentlemen , has anything been decided on this issue of poor drainage on McNabb ? We had another roof leak and interior room damage caused by storm water backing up onto our roof .

As you can see in the attached photos the drain in the ravine still hasn't been addressed . I brought this to the attention of CBW for the past 2 years and can't get any action on it . In fact I met two CBW workers last summer and they saw the problem and it's still not been taken care of . I had to persist that this blocked drain was affecting flow of my roof drains and they refused to understand this .

This drain blockage is also affecting the flow at the catch basin on McNabb St. which flooding at our loading dock .

Can you at the very least send some of the many CBW employees to address this once and for all.

From: Pat McAuley [mailto:pat.mcauley@tulloch.ca]
Sent: Monday, January 20, 2014 1:15 PM
To: Tony Greco
Cc: d.elliott@cityssm.on.ca
Subject: RE: Flooding issue Mcnabb St.

Thanks Tony. I will contact Public Works and discuss. This appears to be a major storm outlet, and needs to be maintained.

Pat

Pat McAuley P.Eng. MBA
Senior Director

TULLOCH
ENGINEERING

Tel: 705 949 1457
Fax: 705 949 9606

Tulloch Engineering Inc.
369 Queen Street East – Suite 1, Sault Ste. Marie, ON P6A 1Z4
pat.mcauley@tulloch.ca | tulloch.ca | legal disclaimer

From: Tony Greco
Sent: Thursday, January 16, 2014 2:12 PM
To: pat.mcauley@tulloch.ca
Cc: d.elliott@cityssm.on.ca
Subject: Flooding issue Mcnabb St.

I wanted to bring to your attention something that may be affecting storm drainage problems on McNabb St. .

My concern is a catch basin on south side of McNabb at Blake St. . This catch basin is close to the property line between the old jail property and the Agero site.
I believe this catch basin drains south to the ravine between the two properties . My concern is that the discharge grate into the ravine is blocked with debris , restricting water flow and causing back pressure on the storm lines. When I looked the discharge grate this summer it was at least 75% blocked .

This past summer we had roof water back up onto our roof three times during the heavy rains because of the lack of flow from our storm lateral which I would assume connects at McNabb . I contacted CBW and they sent two men to look at the ravine blockage but they said it wouldn't affect the drainage flow from my building lines . If the catch basin does flow into this grate I would have to believe that this blockage would affect storm water flow .

Attached is sketch.

Thank you ,

Tony Greco
Facilities Manager
Agero

3

Confidentiality Note: This e-mail message and any attachments may contain confidential or privileged information. If you are not the intended recipient, please notify me immediately by replying to this message and destroy all copies of this message and any attachments. Thank you.

Pat McAuley

From: Tony Greco [
Sent: Wednesday, May 21, 2014 4:00 PM
To: d.elliott@cityssm.on.ca
Cc: Pat McAuley
Subject: RE: Flooding issue Mcnabb St.
Attachments: photo 1.jpg; photo 3.jpg; photo 2.jpg; ATT00004.txt

Gentlemen , has anything been decided on this issue of poor drainage on McNabb ? We had another roof leak and interior room damage caused by storm water backing up onto our roof .

As you can see in the attached photos the drain in the ravine still hasn't been addressed . I brought this to the attention of CBW for the past 2 years and can't get any action on it . In fact I met two CBW workers last summer and they saw the problem and it's still not been taken care of . I had to persist that this blocked drain was affecting flow of my roof drains and they refused to understand this .

This drain blockage is also affecting the flow at the catch basin on McNabb St. which flooding at our loading dock .

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Subject: RE: Flooding issue Mcnabb St.

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Pat

Pat McAuley P.Eng. MBA
Senior Director

TULLOCH
ENGINEERING

Tel: 705 949 1457
Fax: 705 949 9606

Tulloch Engineering Inc.
369 Queen Street East – Suite 1, Sault Ste. Marie, ON P6A 1Z4
pat.mcauley@tulloch.ca | tulloch.ca | legal disclaimer

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Sent: Thursday, January 16, 2014 2:12 PM
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Cc: d.elliott@cityssm.on.ca
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Attached is sketch.

Thank you ,

APPENDIX 4

Natural Environment:

Existing Conditions & Impact Assessment

McNabb Stormwater Management Ravine Diversion

By Tulloch Environmental

TULLOCH

Natural Environment: Existing Conditions & Impact Assessment

McNabb Stormwater Management Ravine Diversion

Project #: 13-1123

Prepared for:
The Corporation of the City of Sault Ste. Marie
99 Foster Drive, P.O. Box 580
Sault Ste. Marie, ON P6A 5N1
T: 705.759.2500

Prepared by:
Tulloch Environmental
1942 Regent Street, Unit L
Sudbury, ON P3E 5V5

1 December 2014

TULLOCH
ENVIRONMENTAL

Table of Contents

List of Tables

Appendices

Figures

1. Introduction

1.1 Project Description

Tulloch Environmental, a Division of Tulloch Engineering (Tulloch) has prepared this report for the Corporation of the City of Sault Ste. Marie in support of a Class Environmental Assessment (EA) associated with proposed stormwater control structures that will be designed to store excess water temporarily within two natural ravines in Sault Ste. Marie, Ontario. This report documents the natural environment existing conditions and impact assessments for one of the McNabb Stormwater Management Ravine (McNabb Ravine) as part of the proposed project. The EA is being carried out in accordance with the planning and design process as outlined in the *Municipal Engineers Association Municipal Class Environmental Assessments*.

A component of the study involves the assessment of the terrestrial and aquatic environment surrounding the proposed works and an evaluation of potential impacts of the proposed work to the surrounding natural areas.

1.1.1 Project Location

The McNabb Ravine is located west of Pim Street and south of Bruce Street, within the City or Sault Ste. Marie. The Ravine is located within Lot 10, Concession 3 in the Township of Tarentorus. General UTM coordinates for the ravine are 705397E and 5155041N (NAD83, Zone 17N).

1.1.2 Proposed Work

An outlet control structure (dam or weir) will be installed at the outlet of the ravine near Gladstone Avenue. The installation of the outlet control structure would result in excess flows being stored during major rainfall events thereby reducing downstream flow and flooding occurrences. This will also permit upstream sewer capacity improvements.

2. Background Information

Various regulatory agencies and other resources were contacted to obtain background information on the existing natural features in and surrounding the project area. The area investigated included the proposed work area, inclusive of the ravine, plus a 120 m buffer extending beyond the ravine (hereinafter referred to as the study area).

A copy of all correspondence and information received is provided in Appendix I for reference.

The Ontario Breeding Bird Atlas (OBBA) was reviewed to identify local bird species likely to inhabit the area including any species at risk (SAR). Information obtained from the OBBA identified species that were noted in the area during the second breeding bird atlas (2001-2005). Table 1 outlines the listed species which are considered federal and/or provincial SAR and potentially in the area. Species are federally designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) under the *Species at Risk Act* (SARA) Schedule 1 list. Species are provincially designated by the Committee on the Status of Species at Risk in Ontario (COSSARO) under the *Endangered Species Act* (ESA).

Table 1- SAR species identified to potentially inhabit the area by the OBBA.

Species (Common Name)	Species (Scientific Name)	S-Rank	Federal Listing	Provincial Listing
Black-crowned Night Heron	*Nycticorax nycticorax*	S3B, S3N	–	–
Bald Eagle	*Haliaeetus leucocephalus*	S2N, S4B	–	Special Concern
Peregrine Falcon	*Falco peregrinus*	S3B	Special Concern	Special Concern
Common Nighthawk	*Chordeiles minor*	S4B	Threatened	Special Concern
Chimney Swift	*Chaeutra pelagica*	S4B	Threatened	Threatened
Eastern Wood Peewee	*Contopus virens*	S4B	–	Special Concern
Bank Swallow	*Riparia riparia*	S4B	–	Threatened
Barn Swallow	*Hirundo rustica*	S4B	–	Threatened
Wood Thrush	*Hylocichla mustelina*	S4B	–	Special Concern
Canada Warbler	*Cardellina canadensis*	S4B	Threatened	Special Concern
Bobolink	*Dolichonyx oryzivorus*	S4B	–	Threatened
Eastern Meadowlark	*Sturnella magna*	S4B	–	Threatened
Rusty Blackbird	*Euphagus carolinus*	S4B	Special concern	–

A review of the Natural Heritage Information Centre (NHIC) database was also conducted to delineate significant natural heritage features (plant communities, wildlife concentration areas, areas of natural and scientific interest (ANSI), as well as any rare or historical species. Two species of conservation concern were identified to occur within the 1km squares that encompass the study area (square 16GS0655, 16GS0654, 16SG0554, and 16GS0555). Milksnake (*Lampropeltis triangulum*) a special concern species provincially and oval-leaved billberry (*Vaccinium ovalifolium*) an S3 ranked species were identified to occur within these 1 km squares.

The Sault Ste. Marie Ministry of Natural Resources and Forestry (MNRF) was contacted to gather environmental values information on the study area including any existing sensitivities and environmental constraints. The MNRF identified a noted occurrence of Greene's Rush (provincially tracked S3 rare species) in the Sault Ste. Marie rail yard. The MNRF also noted that there are no other environmental values within 120 m of the ravine. This ravine is not identified as a permanent stream in the MNRF database and there is no known fishery data or Aquatic Resource Area data available.

A list of terrestrial SAR which may be present in the area was compiled using information obtained from the MNRF, and the SARA and ESA lists. The habitats of these species were then compared to the habitat and natural features observed through aerial imaging and range mapping. Species at Risk with a higher potential of occurrence within the study area based on this review of their ranges and habitat are listed in Table 2.

Table 2. SAR that may potentially be found within the study area.

Species (Common Name)	Species (Scientific Name)	Federal Listing	Provincial Listing
Bald Eagle	*Haliaeetus leucocephalus*	–	Special concern
Bank Swallow	*Riparia riparia*	–	Threatened
Barn Swallow	*Hirundo rustica*	–	Threatened
Canada Warbler	*Cardellina canadensis*	Threatened	Special concern
Chimney Swift	*Chaetura pelagica*	Threatened	Threatened
Common Nighthawk	*Chordelies minor*	Threatened	Special concern
Eastern Small-footed Myotis	*Myotis leibii*	–	Endangered
Eastern Whip-poor-will	*Caprimulgus vociferus*	Threatened	Threatened
Eastern Wood-pewee	*Contopus virens*	–	Special concern
Golden-winged Warbler	*Vermicora chrysoptera*	Threatened	Threatened
Little Brown Myotis	*Myotis lucifugus*	–	Endangered
Milksnake	*Lampropeltis triangulum*	Special concern	Special concern
Monarch butterfly	*Danaus plexippus*	Special concern	Special concern
Northern Myotis	*Myotis septentrionalis*	–	Endangered
Olive-sided flycatcher	*Contopus cooperi*	Threatened	Special concern
Rusty blackbird	*Euphagus carolinus*	Special concern	Not listed
Wood Thrush	*Hylocichla mustelina*	–	Special concern

The study area falls under the jurisdiction of the Sault Ste. Marie Conservation Authority (SSMCA). The SSMCA was contacted to provide Notice of Commencement of Study and to request any available information regarding environmental sensitivities, critical fish or wildlife habitat, SAR or operational constraints. There were no known values or sensitivities identified for the area however the SSMCA noted that the area and proposed work would fall under the *O. Reg 176/06 for Development, Interference with Wetlands and Alterations to Shoreline and Watercourses*. A permit will be required for the proposed work.

3. Methodology

Prior to field investigations, all background information was reviewed. Mapping information and aerial imagery were analyzed to assess the general terrestrial composition and topographical landscape of the study area.

A Tulloch ecologist conducted site investigations on September 9, 2014. The field investigations consisted of Ecological Land Classification (ELC) to describe the plant communities and to identify potential SAR habitat and other protected habitats. Any plants or animals observed within the study area were also documented. However, many migratory species (e.g. birds) that may use this habitat would likely not be present due to the time of year. The investigations included the identification and documentation of:

- Vegetation communities including plant inventories;
- Potential SAR habitat, significant wildlife habitat or other habitat features;
- Wildlife (birds, mammals, amphibians, reptiles, insects) and evidence of wildlife (ie: scat, tracks, nests, eggs, fur, browse, feathers etc.) including SAR;
- Fish habitat
- Areas of groundwater upwelling and high water table; and
- Potential impacts of the proposed works on species and habitat.

The vegetation communities within the study area were mapped using the Great Lakes- St Lawrence Ecological Lands Classification Methodology (Banton et el., 2009).

4. Description of Environmental Resources

The ravine was surrounded by residential and commercial properties, a church and residential subdivisions. The slope into the ravine was steep on all sides and included a vegetation cover of forest, shrub thicket or grass and sedge meadow. Soils within the area were deep, fine mineral, primarily clay and moist to very moist.

4.1 Vegetation Communities

There were no plant SAR or rare plant species observed during field investigations.

Table 3. Ecological Land Classification ecosites identified to occur within the study area.

Ecosite	Vegetation Species List	
G108Tt: Fresh, Silty to Fine Loamy: Mixedwood	*Trees*	Balsam fir (*Abies balsamea*), white spruce (*Picea glauca*), black spruce (*Picea mariana*), jack pine (*Pinus banksiana*), white pine (*Pinus strobus*), large-tooth aspen (*Populus grandidentata*), trembling aspen (*Populus tremuloides*), white birch (*Betula papyrifera*), American beech (*Fagus grandifolia*), American elm (*Ulmus americana*), red oak (*Quercus rubra*), slippery elm (*Ulmus rubra*), basswood (*Tilia americana*), sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), black ash (*Fraxinus nigra*)
	Shrubs	Pussy willow (*Salix discolor),* slender willow (*Salix petiolaris*), speckled alder (*Alnus incana), red osier dogwood (*Cornus sericea), prickly wild rose (*Rosa acicularis*), smooth wild rose (*Rosa blanda*), beaked hazel (*Corylus cornuta*), serviceberry (*Amelanchier spp.*), hawthorne (*Crataegus spp.*), black chokeberry (*Aronia melanocarpa*), chokecherry (*Prunus virginiana*), alternate-leaved dogwood (*Cornus rugosa*), fly honeysuckle (*Diervilla lonicera*), mountain maple (*Acer spicatum), red currant (*Ribes triste), dwarf raspberry (*Rubus pubescens*), northern dwarf raspberry (*Rubus acaulis*), wild red raspberry (*Rubus idaeus*)
	Ground Cover	American vetch (*Vicia Americana*), common burdock (*Arctium minus*), Canada thistle (*Cirsium arvense*), common tansy (*Tanacetum vulgare*), cleavers (*Galium aparine*), curled dock (*Rumex crispus*), spreading dogbane (*Apocynum androsaemifolium*), yellow evening primrose (*Oenothera biennis*), smooth brome grass (*Bromus inermis*), common plantain (*Plantago major*), hoary plantain *(Plantago media),* cow vetch *(Vircia cracca*), black snake root (*Actaea racemosa*), purple-stemmed aster (*Symphyotrichum puniceum*), panicled aster (*Symphotrichum lanceolatum*), wild sarsaparilla (*Aralia nudicaulis*), kidney-leaved violet (*Viola renifolia*), blue bead lily (*Clintonia borealis*), false solomon's seal (*Maianthemum racemosum*), hairy solomon's seal (*Polygonatum pubescens*), red baneberry (*Actaea rubra*), hooked agrimonia *(Agrimonia gryposepala*), large-leaved avens (*Geum macrophyllum*), large-leaved aster (*Eurybid macrophylla*), spinulose wood fern (*Dryopteris cathusiana*), goutweed (*Agopodium podagraria*)

Photo 1. Understory and canopy	
Photo 2 Canopy	

Ecosite	Vegetation Species List	
G142N: Mineral Meadow Marsh	*Shrubs*	Morrow's honeysuckle (*Lonicera morrowii*)
	Ground Cover	American vetch, common burdock, Canada thistle, common tansy, cleavers, curled dock, cattail (*Typha* sp.), spreading dogbane, yellow evening primrose, common jewelweed (*Impatiens capensis*), smooth brome, quack grass (*Elymus repens*), foxtail barley (*Hordeum jubatum*), green foxtail (*Setaria viridis*), canary reed grass (*Phalaris arundinacea*), Canada bluejoint (*Calamagrostis canadensis*), white sweet clover (*Melilotus albus*), common plantain, hoary plantain, Cow vetch, black snake root, spotted joe pye weed (*Eutrochium maculatum*), purple stemmed aster, panicled aster, Himalayan balsam (*Impatiens glandulifera*), Canada golden rod (*Solidago canadensis*), rough-stemmed golden rod (*Solidago rugosa*), red top (*Agrostis gigantean*), horsetail (*Equisetum* sp.)

Photo 3

Wetland area dominated by Himalayan balsam

Photo 4

Wetland area dominated by sedges and grasses.

Three plant species which classify as aggressive invasive exotic species were identified within the study area. The Himalayan balsam and Morrow's honeysuckle were identified within the G142N ecosite, and Goutweed was identified within the southern portion of the G108Tt ecosite.

The remainder of the study area consisted of maintained lawn and residential, commercial, and institutional properties.

4.2 Wildlife

There were no wildlife SAR or rare wildlife species observed during field investigations.

There was some bird activity through the study area. A northern flicker (*Colaptes auratus*), hairy woodpecker (*Picoides villosus*), hermit thrush (*Catharus guttatus*) and cedar waxwings (*Bombycillla cedrorum*) were observed within the study area. Although birds were observed during site investigations, these investigations were conducted outside of a time of year conducive to successful identification of breeding birds and their habitat (ie. Migratory bird windows).

4.3 Fish Habitat

No direct or indirect fish habitat was identified within the study area. There was no evidence of any connection to fish habitat, or consistent flow within the ravine. There was no passage for fish at either end of the ravine.

5. Potential Impacts to Environmental Resources

The following section outlines potential impacts that may result from the proposed work within the study area. Short term impacts are those generally associated with construction operations including clearing and grading of vegetation and soils, operation of heavy equipment, stockpiling of materials etc. While these activities have the potential to negatively impact natural features, the implementation of appropriate mitigation measures can reduce their impact. Short term impacts are generally not permanent in nature. Long term impacts are those expected to result in permanent alteration or removal of natural features or habitat within the existing environment, such as the removal of vegetation.

It is expected that this project will result primarily in short term impacts, most of which may be reduced through the use of appropriate mitigation measures outlined in Section 6.

5.1 Vegetation

There will be a minimal loss of vegetation during the construction of the outlet control structure. As the ravine will be seasonally, and in times of major rainfall events, flooded with water, it is likely that some of the vegetation, aside from water tolerant species such as cattails, will be destroyed. Currently, this ravine floods periodically due to restriction in the box culvert crossing at Gladstone Ave. All of the species identified within the study area are non-native or common throughout the region. In fact, two species found within the area that will be flooded are considered aggressive invasive species. These species include:

- Morrow's honeysuckle which:
    - Rapidly invades areas, outcompeting native plant species by forming dense patches
    - Affect light and nutrient availability to neighbouring plants
    - Produce toxic chemicals that prevent other plants from growing in that area.

- Himalayan balsam which:
    - Creates a dense stand that prevents native plants from establishing
    - Is an annual species that can aggressively replace native perennial plants along river banks, leading to soil erosion

If flooding occurs during a significant period of time in the spring, it is possible that these species may be destroyed.

Another aggressively invasive species was identified within the G108Tt ecosite. This species is:

- Goutweed which:
    - Create dense carpets of vegetation that limit the amount of sunlight available to other species affecting overall plant diversity

These species can be easily spread through tools, footwear and machinery that enter the contaminated area.

5.2 Wildlife

Birds

As site investigations were conducted outside of the migratory bird breeding period, identification of SAR bird habitat could not be completed. Although, it is possible that habitat for SAR birds may occur within the study area, the study area was not identified to be highly suitable for any endangered or threatened SAR birds. Any clearing of vegetation for the construction of the outlet control structure could results in the loss of potential nesting or roosting sites for migratory birds. Noise during construction may also result in the temporary disturbance of birds surrounding the project site. The release of any harmful substance (such as oil) into or in the vicinity of the adjacent riparian and wetland communities during construction activity could also impact migratory birds. Under the *Migratory Bird Convention Act* (MBCA) the destruction of an active migratory bird nest and the release of deleterious substances into water are prohibited. These impacts have the potential to be long-term, if the appropriate mitigation is not followed. Several SAR bird species have general habitat protection and the destruction of this habitat would be in contravention of the ESA.

Reptiles

Reptiles, birds and other wildlife also have the potential of becoming entangled in the gillnet- like mesh netting associated with some heavy duty silt fencing and other erosion control products, if used at the site (see MNR notice Appendix I). Erosion control products also have the potential to act as barriers to wildlife and impede their movement.

Most species identified within the study area, are not expected to be impacted long term by the temporary loss of habitat cause by the construction activity, or by the storage of water within the ravine.

6. Mitigation Strategies

All mitigation strategies outlined in the following section should be incorporated into the project during the appropriate outlined stages of construction (pre-, during or post-). A pre-construction meeting should be held with all workers to outline the work plan and all environmental constraints associated with working on site. Briefings should be held for any new workers on site.

6.1 Vegetation

It is expected that construction activity will result in a minimal loss of vegetation; however the storage of excess flow waters within the ravine area will potentially destroy most of the vegetation aside from water tolerant species. Most of the species within the ravine area were deemed non-native or common throughout the area. The following mitigation strategies are recommended to limit impacts to vegetation:

Best Practice

- **Minimize vegetation removal:** Avoid riparian vegetation removals. Use existing trails whenever feasible. If removal is necessary, minimize clearing, protect adjacent vegetation and use proper clearing techniques. Where possible use techniques that allow the root system to stay intact; this helps bind the soil and encourages rapid colonization of low-growing plant species. Avoid all vegetation removals wherever possible;
- **Restore native vegetation:** Restorative plantings and seed mixes of species common to the region should be used for erosion control and rehabilitation of disturbed areas, recommended species include those resistant of seasonal flooding, such as: red osier dogwood (*Cornus sericea*), speckled alder (*Alnus incana*), meadowsweet (*Spirea* spp.), willows (*Salix* spp), Bebb's sedge (*Carex bebbii*), soft rush (*Juncus effuses*), path rush (*Juncus tenuis*), joe pye weed, blue vervain (*Verbena hastate*), and blue flag iris (*Iris versicolor*).

As several aggressive invasive species were identified within the study area and within the proposed work area the following mitigation measures are recommended to prevent the spread of these species into other areas:

- **Clean Equipment:** All mobile equipment should be cleaned by pressure washing before leaving the site.
- **Limit use of tracked machinery:** If tracked machinery is required, their use should be avoided within contaminated areas or thoroughly cleaned before leaving the site.
- **Clean tools and footwear:** Ensure all tools and footwear which would have entered the contaminated site are cleaned prior to leaving the site.
- **Use fill on site:** If materials are excavated for the construction of the outlet control structure, ensure that all fill remains on site.

6.2 Wildlife

Impacts mainly involve the temporary disturbance of wildlife species and habitat during construction activities. A minimal loss of wildlife habitat is expected due to clearing of the vegetation.

The mitigation strategies listed below are recommended to limit impacts to wildlife during and after construction:

Mitigation to Prevent Impacts to Migratory Birds and Avoid Contravention of the MBCA and ESA

- **Avoid destruction or disturbance of an active migratory bird nest:**
    - Clearing should occur outside of the migratory bird nesting season (beginning of April to end of August; Canadian Wildlife Service). As site investigations were conducted outside of timing conducive to identifying breeding birds and their nests, including SAR, this mitigation is highly recommended. Clearing should occur within the proposed work area plus a minimum 10 m additional buffer surrounding the work area. Pre-clearing nest searches are typically not recommended in previously undisturbed habitat because, in most habitats like the ravine, the ability to detect nests is very low, while the risk of disturbing an active nest is high. Incidental take is still likely to occur.
    - It is recommended that construction also occur outside of the migratory bird nesting season (beginning of April to end of August; Canadian Wildlife Service). If this is not possible a migratory bird nest check should be conducted within the proposed work area plus a minimum of 10 m surrounding the proposed work area. Due to the typical noise level of construction activities of over 50 db, the construction activity proposed is considered to pose a high risk for migratory bird disturbance and as such, a buffer/setback distance from an active migratory bird nest of at least 10 m will be required.

- **Avoid the release of substances harmful to migratory birds into waters or adjacent areas:**
    - **Equipment**: Operate, store and maintain (e.g., re-fuel, lubricate) all equipment and associated materials in a manner that prevents the entry of any deleterious substance to the water body. Any part of equipment entering the water body or operating on the bank shall be free of fluid leaks and externally cleaned/ degreased.
    - **Spills:** Ensure a Spills Management Plan (including materials, instructions regarding their use, education of contract personnel, emergency contact numbers) is on site at all times for implementation in event of accidental spill. The Ontario Ministry of the Environment operates the Spills Action Centre 24-hours a day; it can be reached at 1-800-268-6060.
    - **Chemicals:** Use only specified amounts and types of fertilizer in areas draining to water bodies. Avoid use of chemical dust suppressants and pesticides/herbicides in areas near or draining to water bodies.

Best Practice Mitigation:

- **Flag the work area:** Access and activity should be limited to the designated work area to minimize disturbance to adjacent wildlife habitat. This area should be delineated in the field using stakes, tape etc. and removed when work is completed.
- **Check work area each day:** Snakes are attracted to the roadway, embankment, temporary stockpiles and machinery, as these surfaces absorb heat from the sun and are suitable for reptile basking. If possible, work areas should be checked for reptiles prior to work each day. If in immediate danger (collision with traffic/construction equipment) reptiles can be moved to adjacent habitat without harm (to worker or reptile) by using a shovel or stick and bucket.

- **Avoid use of erosion control products with plastic netting:** The ”gillnet-like” mesh associated with erosion control products can pose an entanglement hazard to wildlife such as snakes, turtles, birds and other wildlife (see MNR notice Appendix I). Some manufacturers claim these plastic components break down over time however this can take several months under ideal conditions. If possible, the use of erosion control products containing any type of plastic mesh should be avoided. Rock rip rap, various mulches, and polyethylene sheeting may be effective alternatives. Some rolled erosion control products are available without the plastic mesh.
- **Avoid use of heavy duty silt fencing reinforced with mesh netting:** Heavy duty silt fencing constructed with nylon mesh netting reinforcement can pose an entanglement hazard to snakes and other wildlife (see MNR notice Appendix I). If possible, the use of heavy duty silt fencing constructed with nylon mesh netting reinforcement should be avoided. Silt fencing without the mesh netting may be a suitable alternative.
- **Remove temporary erosion control measures:** When work is completed and areas are stabilized temporary erosion control measures (silt fencing, straw bales etc.) should be removed from the work site. These devices can act as a barrier to wildlife and impede their movement.

7. Assessment of Residual Effects

No significant impacts or residual effects are expected upon completion of the McNabb storm water management ravine diversion pending the mitigation measures from Section 6 are implemented. There will be some loss of vegetation in the area of the outlet control structure and throughout the ravine due to increased water storage, however all species identified were either non-native or common throughout the area. The majority of wildlife habitat will remain intact.

8. Conclusion & Summary

A background records review and site investigation were conducted to obtain information on the existing natural features in and around the study area.

The SSMCA noted that the area and proposed work would fall under the *Development, Interference with Wetlands and Alteration to Shorelines and Watercourse Regulation O. Reg. 176/06*. A permit will be required for the installation of the outlet control structure.

No SAR or rare wildlife were identified within the study area. It is highly recommended that construction be avoided during the migratory bird breeding period (beginning of April- End of August). A minimal loss of wildlife habitat is expected due to the proposed work.

Some loss of vegetation will occur due to the construction of the outlet control structure and the associated retention of storm water; however all of the identified species were either non-native or common throughout the area. Several aggressive invasive species were identified to occur within the study area and the area of proposed work. It is highly recommended that the mitigations provided in Section 6 are implemented to prevent the further spread of these species.

The McNabb storm water management ravine diversion is expected to result in primarily short term impacts to environmental resources. No significant residual effects are expected, provided the mitigation measures in Section 6 are implemented.

The observations and results obtained during these investigations are representative of the conditions encountered during the 2014 site visit. Many species are migratory and may occur within the area during some years and not others. Habitat (vegetation communities) also changes over time and may become more or less suitable for SAR. Tulloch has used its best professional judgment to interpret the site investigation observations along with the background information and provided accurate conclusions.

Respectfully submitted,

Kristan Washburn, MES
Terrestrial Ecologist

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Urban Forest Associates Inc. (2202) SER Ontario Invasive species list. Invasive exotic species ranking for Southern Ontario.

FIGURES

Legend

⊗ Ravine Location

Notes:

Background basemap produced by ESRI
Bing Hybrid Map 2013

TULLOCH ENVIRONMENTAL

0 465 930 1,860 2,790 Meters

Datum: NAD83
Projection: UTM Zone 16N

N W E S

McNabb Stormwater Management
Ravine Diversion

General Location Map

Project 145011	Figure 1
SCALE: 1:53,600	Date: December 2014

Legend

- Study Area
- Ecosite

G108Tt: Fresh, Silty to Fine Loamy Mixedwood
G142N: Mineral Meadow Marsh

Notes:

Background basemap produced by ESRI
Bing Hybrid Map 2013

TULLOCH ENVIRONMENTAL

0 20 40 80 120 Meters

Datum: NAD83
Projection: UTM Zone 16N

N W E S

McNabb Stormwater Management
Ravine Diversion

Ecological Land Classification

Project 145011	Figure 2
SCALE: 1:2,700	Date: December 2014

Appendix I: Background Information and Correspondence

TULLOCH
ENVIRONMENTAL

1942 Regent Street
Unit L
Sudbury, ON
P3E 5V5

T. 705 671.2295
F. 705 671.9477
TF. 800 810.1937
sudbury@TULLOCH.ca
WWW.TULLOCH.ca

August 29, 2014

Greg Cull

Sault Ste. Marie Management Biologist

Ontario Ministry of Natural Resources and Forestry

64 Church Street

Sault Ste. Marie, ON

P6A 3H3

705-941-5125

Dear Mr. Cull,

Re: Natural Heritage Background Information Request (Tulloch Project # 145011)

Sault Ste. Marie Stormwater Management Project

The City of Sault Ste. Marie has retained Tulloch Engineering to conduct a Municipal Class Environmental Assessment in support of proposed improvements to the existing stormwater management system in Sault Ste. Marie, ON.

In response to local flooding during storm events, it is proposed that storm water from the surrounding subdivisions be diverted into two natural ravines. New water control structures, designed to store excess water during storm events and allow it to drain out slowly after the storm has passed, are proposed. The assessment includes a review of available background natural heritage information from regulatory agencies and on-site field assessments.

The project location is within the city limits of Sault Ste. Marie. Ravine 1 is located west of Pim Street and south of Bruce Street. Ravine 2 is located west of Pine Street and south of MacDonald Avenue. A map indicating the area of the proposed work is appended to this letter. The centre of the ravines and study areas are at the following coordinates (UTM Zone 16, NAD 83):

Ravine 1: 705453 E, 5155020 N

Ravine 2: 706389 E, 5154681 N

Tulloch Environmental, a division of Tulloch Engineering, has reviewed the Natural Heritage Information Centre (NHIC) website plus several other online sources to compile a list of existing records of species at risk and significant natural heritage features in the vicinity of the project. Search results indicated one SAR occurrence and one species of conservation concern within the 1 km squares that encompass the study area (Squares 16GS0655, 16GS0654, 16GS0554 and 16GS0555):

- Milksnake (*Lampropeltis triangulum*), Element Occurrence ID 91292, and
- Oval-leaved Bilberry (*Vaccinium ovalifolium*), S-rank 3, Element Occurrence ID 60156.

We have prepared a list of provincially and federally listed SAR that may potentially inhabit the study area based on searches of various other resources, ranges and habitat preferences. A copy of this list is appended to this letter (Table 1). We are requesting that the OMNRF provide, where possible, any additional details, records of occurrences or other information on the species list and occurrences in the list provided.

We also request the following information and guidance from the OMNRF:

- Terrestrial data for the adjacent lands to the ravines, such as:
    - records of species at risk or species of conservation concern

  - timing windows or other restrictions
  - wildlife habitat use, and
  - significant portions of the habitat of any species at risk.

- Fishery data for potential watercourse in Ravine 1 (noted in some topographic maps), including
  - fish community species
  - thermal regime
  - areas of known critical habitat (spawning, etc.)
  - aquatic species at risk (records, local knowledge)
  - barriers to passage
  - in-water work timing windows
  - areas of concern (e.g. known sources of sediment and erosion, sources of pollution, etc.).

A similar request has been submitted to the SSMRCA. It is our understanding that approvals will be required under their CA regulations but that no permits are required for this work under the *Public Lands Act* or *Lakes and Rivers Improvement Act*.

If you have any questions or require additional information please do not hesitate to contact the undersigned at (705) 522-6303.

Thank you for your time and assistance.

Sincerely,

Amy Ingriselli

Fisheries Assessment Specialist

c.c. Pat McAuley, P. Eng. MBA

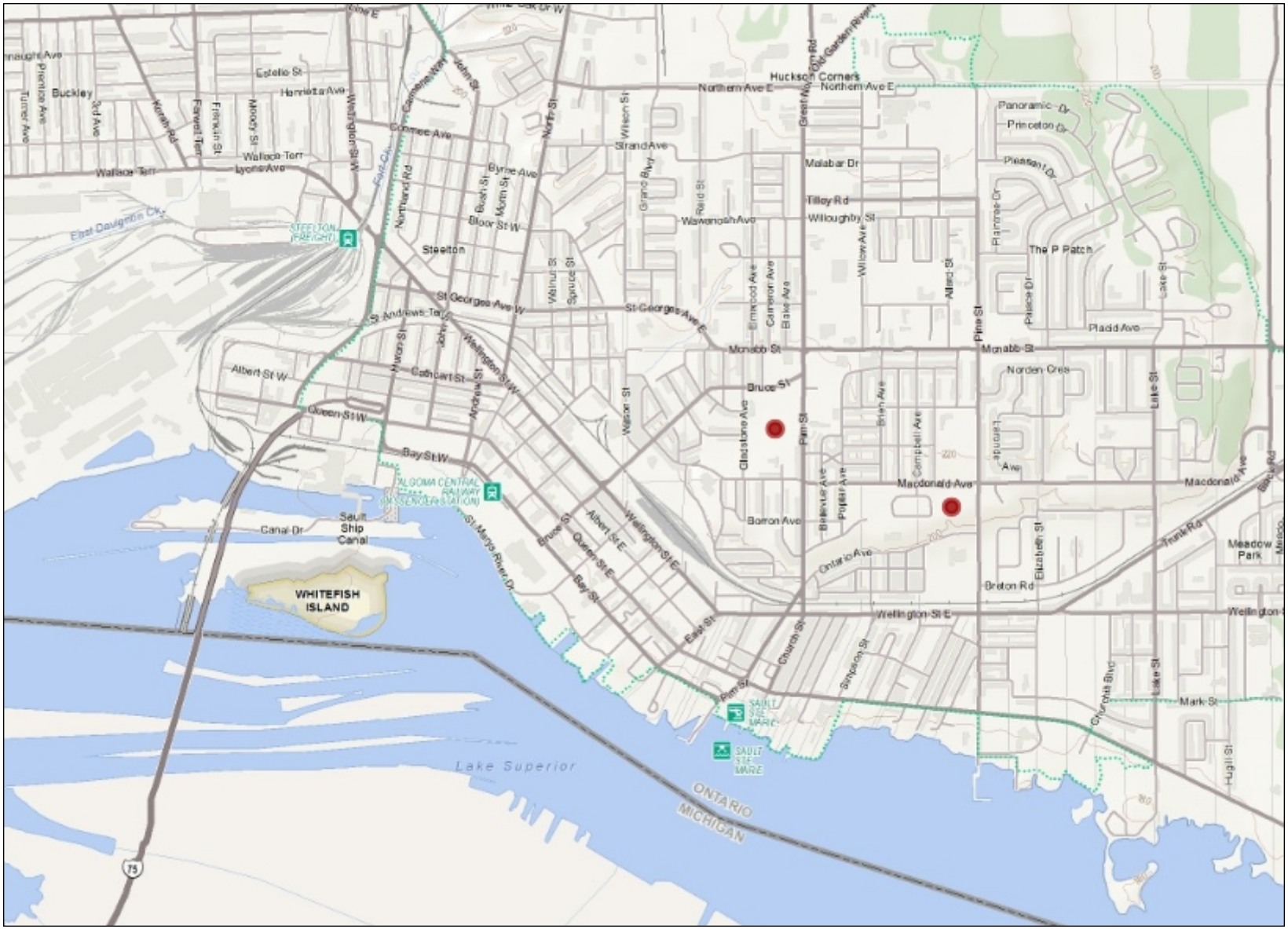
Tulloch Engineering

MINISTRY OF NATURAL RESOURCES AND FORESTRY

Make a Topographic Map

Sault Ste. Marie Stormwater Management

Notes:
Tulloch Environmental



Legend

- Building as Symbol
- Building to Scale
- Runway
- Heliport \ Hospital Heliport
- Seaplane Base
- Ferry Route
- Trail Head \ Trail
- Railway \ Train Station
- Railway with Bridge
- Railway with Tunnel
- Road (Major → Minor)
- Winter Road
- Road with Bridge
- Road with Tunnel
- Primary, Kings or 400 Series Highway
- Secondary Highway
- Tertiary Highway
- District, County, Regional or Municipal Road
- Toll Highway
- One Way Road
- Road with Permanent Blocked Passage
- Road with Address Ranges
- Hydro Line, Communication Line or Unknown Transmission Line
- Natural Gas Pipeline, Water Pipeline or Unknown Pipeline
- Spot Height
- Index Contour
- Contour
- Wooded Area
- Wetland
- Waterbody
- Waterbody Elevation
- Watercourse
- Falls
- Rapids
- Rapids \ Falls
- Rapids
- Rocks
- Lock Gate
- Dam \ Hydro Wall
- Dam \ Hydro Wall
- Provincial \ State Boundary
- International Boundary
- Upper Tier \ District Municipal Boundary
- Lower Tier \ Single Tier Municipal Boundary
- Lot Line
- Indian Reserve
- Provincial Park
- National Park
- Conservation Reserve
- Military Lands

1.6 0 0.79 1.6 km

Scale: 1 : 30,941

Projection: Web Mercator

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Table 1. SAR with high potential of occurrence within the study area (based on historical records, habitat and ranges).								
Common Name	**Scientific Name**	**Status**			**Info Source**			
		SARA	**ESA**	**S-Rank**	**EBird[1]**	**OBBA[2]**	**OMNRF[3]**	**NHIC[4]**
Eastern Meadowlark	*Sturnella magna*	-	THR	S4B	✓	✓	✓	
Bobolink	*Dolichonyx oryzivorus*	-	THR	S4B	✓	✓	✓	
Wood Thrush	*Hylocichla mustelina*	-	SC	S4B	✓	✓	✓	
Horned Grebe	*Podiceps auratus*	-	SC	S1B S4N	✓		✓	
Barn Swallow	*Hirundo rustica*	-	THR	S4B	✓	✓	✓	
Chimney Swift	*Chaetura pelagica*	THR	THR	S4B, S4N	✓	✓	✓	
Short-eared Owl	*Asio flammeus*	SC	SC	S2N, S4B	✓		✓	
Bank Swallow	*Riparia riparia*	-	THR	S4B	✓	✓	✓	
Black Tern	*Chlidonias niger*	-	SC	S3B	✓		✓	
Bald Eagle	*Haliaeetus leucocephalus*	-	SC	S2N, S4B	✓	✓	✓	
Eastern Wood-pewee	*Contopus virens*	-	SC	S4B	✓	✓	✓	
Common Nighthawk	*Chordeiles minor*	THR	SC	S4B	✓	✓	✓	
Rusty Blackbird	*Euphagus carolinus*	SC	-	S4B	✓	✓	✓	
Olive-sided Flycatcher	*Contopus cooperi*	THR	SC	S4B			✓	
Least Bittern	*Ixobrychus exilis*	THR	THR	S4B			✓	
Yellow Rail	*Coturnicops noveboracensis*	SC	SC	S4B			✓	
Eastern Whip-poor-will	*Caprimulgus vociferus*	THR	THR	S4B	✓		✓	
Peregrine Falcon	*Falco peregrinus*	SC	SC	S3B	✓	✓	✓	
Red-headed Woodpecker	*Melanerpes erythrocephalus*	THR	SC	S4B	✓		✓	
Wood Thrush	*Hylocichla mustelina*	-	SC	S4B	✓	✓		
Canada Warbler	*Cardellina canadensis*	THR	SC	S4B	✓	✓	✓	
Monarch Butterfly	*Danaus plexippus*	SC	SC	S2N, S4B			✓	
West Virginia White	*Pieris virginiensis*	-	SC	S3			✓	
Common Five-lined Skink	*Plestiodon fasciatus*	SC	SC	S3			✓	
Wood Turtle	*Glyptemys insculpta*	THR	END	S2			✓	
Eastern Cougar	*Puma concolor*	-	END	SU			✓	
Little Brown Myotis	*Myotis lucifugus*	-	END	S4			✓	

Northern Myotis	*Myotis septentrionalis*	-	END	S3			✓	
Milksnake	*Lampropeltis triangulum*	SC	SC	S3			✓	✓
Flooded Jellyskin	*Leptogium rivulare*	THR	THR	S3			✓	
Oval-leaved Bilberry	*Vaccinium ovalifolium*	-	-	S3			✓	✓

1Cornell Lab of Ornithology, eBird web application. July, 2014 for Desbarats, Ontario

2Ontario Breeding Bird Atlas, Second Atlas. Square 17KM73

3Ontario Ministry of Natural Resources and Forestry Species at Risk website http://www.ontario.ca/environment-and-energy/species-risk-ontario-list

4Natural Heritage Information Centre website https://www.ontario.ca/environment-and-energy/natural-heritage-information-centre

Ministry of Natural Resources and Forestry

Sault Ste. Marie District Office
64 Church Street
Sault Ste. Marie, ON P6A 3H3
Tel.: 705-949-1231
Fax.: 705-949-6450

Ministère des Richesses naturelles et des Forêts

Bureau du district de Sault Ste. Marie
64, rue Church
Sault Ste. Marie, ON P6A 3H3
Tél.: 705-949-1231
Téléc.: 705-949-6450

September 15, 2014

Amy Ingriselli
Fisheries Assessment Specialist
Tulloch Environmental
1942 Regent Street Unit L
Sudbury, ON P3E 5V5

SUBJECT: Natural Heritage Background Information Request (Tulloch Project # 145011) – Sault Ste. Marie Stormwater Management Project

Dear: Ms. Ingriselli:

Thank you for your letter dated August 29, 2014, requesting information about species at risk (SAR), terrestrial data for the adjacent lands to the ravines and fishery data for the potential watercourse in Ravine 1. Listed below is information in reply to your letter.

1. MNR's inventory of SAR is incomplete. There is the potential for additional species to be present in and adjacent to the project area. An updated list of all known SAR within Sault Ste. Marie District is included. All species have the potential to be present, should suitable habitat be available. For information on how SAR are protected, please refer to www.ontario.ca/speciesatrisk.

2. It should be noted that the documented occurrences of Milksnake and Oval-leaved Bilberry identified within the 1 km squares that encompasses the study area are historical in nature (greater than 30 years since the observation dates).

3. A review of Table 1 (SAR- potential of occurrence in the study area) provided with your letter revealed no additional records of occurrences, details or information about species at risk in the study area or occurrences of the species shown on the list provided.

4. Terrestrial data for the adjacent lands to the ravines:

    - **Records of species at risk or species of conservation concern** – there is one occurrence of Greene's Rush (provincially tracked S3 rare species of conservation concern) in the Sault Ste. Marie rail yard but the viability of this occurrence, from a 1998, observation is not verified.
    - timing windows or other restrictions – none identified
    - wildlife habitat use – no specific wildlife habitat data available
    - significant portions of the habitat of any species at risk – none identified

/…2

5. Fishery data for potential watercourse in Ravine 1 – this watercourse is not identified as a permanent stream in the Ministry of Natural Resources and Forestry data base and there is no known fishery data (as per the information requested) or Aquatic Resource Area data available for this watercourse. Any plans to increase or divert stormwater into this ravine should consider sediment and erosion control measures that mitigate any environmental impacts from stormwater potentially entering any natural watercourse.

If you have any other questions, please contact me at greg.cull@ontario.ca or 705-941-5108.

Yours truly,

Greg Cull
Management Biologist
Sault Ste. Marie District

TULLOCH
ENVIRONMENTAL

1942 Regent Street
Unit L
Sudbury, ON
P3E 5V5

T. 705 671.2295
F. 705 671.9477
TF. 800 810.1937
sudbury@TULLOCH.ca
WWW.TULLOCH.ca

August 29, 2014

Rhonda Bateman
General Manager
Sault Ste. Marie Region Conservation Authority
1100 Fifth Line East
Sault Ste. Marie, ON
P6A 6J8
705-946-8530

Dear Ms. Bateman,

Re: Natural Heritage Background Information Request (Tulloch Project # 145011)
Sault Ste. Marie Stormwater Management Project

The City of Sault Ste. Marie has retained Tulloch Engineering to conduct a Municipal Class Environmental Assessment in support of proposed improvements to the existing stormwater management system in Sault Ste. Marie, ON.

In response to local flooding during storm events, it is proposed that storm water from the surrounding subdivisions be diverted into two natural ravines. New water control structures, designed to store excess water during storm events and allow it to drain out slowly after the storm has passed, are proposed. The assessment includes a review of available background natural heritage information from regulatory agencies and on-site field assessments.

The project location is within the city limits of Sault Ste. Marie. Ravine 1 is located west of Pim Street and south of Bruce Street. Ravine 2 is located west of Pine Street and south of MacDonald Avenue. A map indicating the area of the proposed work is appended to this letter. The centre of the ravines and study areas are at the following coordinates (UTM Zone 16, NAD 83):

Ravine 1: 705453 E, 5155020 N

Ravine 2: 706389 E, 5154681 N

Tulloch Environmental, a division of Tulloch Engineering, has reviewed the Natural Heritage Information Centre (NHIC) website plus several other online sources to compile a list of existing records of species at risk (SAR) and significant natural heritage features in the vicinity of the project. Search results indicated one SAR occurrence and one species of conservation concern within the 1 km squares that encompass the study area (Squares 16GS0655, 16GS0654, 16GS0554 and 16GS0555):

- Milksnake (*Lampropeltis triangulum*), Element Occurrence ID 91292, and
- Oval-leaved Bilberry (*Vaccinium ovalifolium*), S-rank 3, Element Occurrence ID 60156.

We have prepared a list of provincially and federally listed SAR that may potentially inhabit the study area based on searches of various other resources, ranges and habitat preferences. A copy of this list is appended to this letter (Table 1). We are requesting that the SSMRCA provide, where possible, any additional details, records of occurrences or other information on the species list and occurrences in the list provided.

We also request the following information and guidance from the SSMRCA:

- Any available terrestrial data for the adjacent lands to the ravines, such as:
    - records of species at risk or species of conservation concern
    - timing windows or other restrictions

  - wildlife habitat use, and
  - significant portions of the habitat of any species at risk.

- Any available fishery data for potential watercourse in Ravine 1 (noted in some topographic maps), including
  - fish community species
  - thermal regime
  - areas of known critical habitat (spawning, etc.)
  - aquatic species at risk (records, local knowledge)
  - barriers to passage
  - in-water work timing windows
  - areas of concern (e.g. known sources of sediment and erosion, sources of pollution, etc.).

The Ontario Ministry of Natural Resources and Forestry has also been contacted for information. We are also asking that the SSMRCA confirm any regulatory permits and/or environmental assessments that may be required of the City under the *Conservation Authorities Act,* etc.

If you have any questions or require additional information please do not hesitate to contact the undersigned at (705) 522-6303.

Thank you for your time and assistance.

Sincerely,

Amy Ingriselli

Fisheries Assessment Specialist

C.C. Pat McAuley, P. Eng. MBA

Tulloch Engineering, Sault Ste. Marie, ON

Sault Ste. Marie Region Conservation Authority
SSMRCA

1100 Fifth Line East
Sault Ste. Marie, ON P6A 6J8
Phone: (705) 946-8530
Fax: (705) 946-8533
Email: nature@ssmrca.ca
www.ssmrca.ca

September 3, 2014

Attn: Amy Ingriselli, Fisheries Assessment Specialist
Tulloch Environmental
1942 Regent Street, Unit L
Sudbury On P3E 5V5

Re: Natural Heritage Background Information Request (Tulloch Project # 145011)
Sault Ste. Marie Stormwater Management Project.

Dear Ms. Ingriselli:

Regarding your request for information and/or comments from our office dated August 29, 2014.

The subject properties, identified in your correspondence as Ravine 1 and Ravine 2 are under the jurisdiction of the Sault Ste. Marie Region Conservation Authority with regard to the O. Reg.176/06 for Development, Interference with Wetlands and Alterations to Shoreline and Watercourses (ravine area with erosion hazard).

Any development within the areas identified as Ravine 1 and Ravine 2 will require a permit from our office that will contain specific conditions.

The subject property is not under the jurisdiction of the Drinking Water Source Protection Program of the Conservation Authority with regard to Drinking Water Source Protection (DWSP).

Our office does not have any current information regarding species at risk or species of conservation concern or habitat use.

Department of Fisheries and Oceans regulates the in-water work windows and a request for fisheries information and/or application is available on their website. Please refer to the enclosed fact sheet.

Sincerely,

Marlene McKinnon, CGS
GIS Specialist

File: DVLP_INQ_TULLOCH_CitySSMStormwaterManagement_20140902.docx

Sault Ste. Marie Region Conservation Authority
SSMRCA

1100 Fifth Line East
Sault Ste. Marie, ON P6A 6J8
Tel: (705) 946-8530
Fax: (705) 946-8533
Email: nature@ssmrca.ca
www.ssmrca.ca

Please note the following changes to our permitting process:

In the past the SSMRCA was a one window stop for residents to access approvals, permits and/or authorizations from several provincial and federal agencies.

It is the responsibility of the applicant to contact other agencies and comply with all existing laws and regulatory requirements. Applicants need to be aware that approvals may also be required from other agencies as well, such as the municipality, Ontario Ministry of Natural Resources and the Federal Department of Fisheries and Oceans. Approval from our agency does not guarantee approval from other agencies.

Ministry of Natural Resources (MNR)

Recent changes to the *Public Lands Act* came into effect on January 1, 2014. Under this act or other acts such as the **Lakes Rivers Improvement Act, applicants** may require an authorization or permit from MNR.

It is the responsibility of the applicant to register via the MNR's Registry and Approval Service Centre or contact them at 1-855-613-4256, Email: mnr.rasc@ontario.ca.

Changes to the Federal Fisheries Act

Recent changes in the *Fisheries Act* which came into effect on November 25, 2013 have changed the way some projects in or near the water are now reviewed.

Applicants can learn more about the new process at www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html or you can contact Fisheries and Oceans Canada directly by phone at 1-855-852-8320 or by email at fisheriesprotection@dfo-mpo.gc.ca.

Information contained on the Fisheries and Oceans Canada website will allow proponents to self-assess their project and if required submit an application.

The SSMRCA will continue to administer *Ontario Regulation 176/06 – Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* using a science based approach as well as the tools provided by the Ontario Conservation Authorities Act in the area under our jurisdiction.

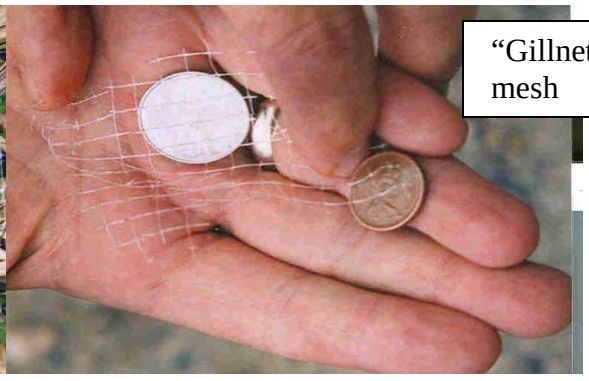
ENVIRONMENTAL ADVISORY:
Erosion Control Netting responsible for fish and wildlife mortality

Erosion control blankets used to prevent erosion employ a “gillnet-like” mesh intended to keep straw mulch, coconut or similar type material in place on stream banks until the establishment of vegetation. Reports from across the province of various wildlife deaths due to entanglement in this mesh have prompted notification of these concerns by the Ministry of Natural Resources. In an effort to prevent fish and wildlife mortality and ensure the protection of threatened or endangered species, please consider alternative products for erosion control.

1. Garter snake fatally entangled in silt fence.

2. Improper installation at a culvert.

Biodegradable versions of the netting are available, however reports indicate that biodegradable mesh is still a risk to wildlife prior to disintegration. Rock rip-rap is an effective alternative. Hydro seeding is also an alternative as long as it is not applied too late in the season. Kevin Brown, Sr. Project Engineer (MNR) has a wide variety of products and can provide contacts for suppliers. Kevin can be reached at (807) 475-1342 or email: **kevin.brown@mnr.gov.on.ca**.



“Gillnet -Like” mesh

An example of a properly stabilized bank using rip-rap can be seen at Mile 10 on the Blueberry Road northeast of Longlac.

Wildlife Mortality Reports:

MNR, Kenora District- Large snapping turtles, mink, snakes and ducklings fatally entangled.

MNR, Geraldton District – Entanglement of 6 garter snakes.

MNR, Parry Sound District – Entanglement deaths of large bodied snakes in heavy duty silt fencing: 2 Eastern Massasauga Rattlesnakes (nationally threatened) and 3 Northern Watersnakes. There are other snakes categorized as species at risk in the area.

MNR, Timmins District – Similar plastic netting fatally entangled migrating songbirds.

MNR, Kemptville District – garden mesh and netting products responsible for killing snakes. In particular, eight Black Ratsnakes (threatened) have been found dead in this type of netting in the last three years.

Northern Illinois University – 3 documented cases of three large milk snakes that perished in the same manner.

A paper has also been written on the subject:
Stuart, J.N., Watson, M.I, Brown, T.L. and C. Eustice. 2001. Plastic Netting: An Entanglement Hazard to Snakes and Other Wildlife. Herpetological Review. 32(3) 162-164.

Conservation Advisory

Heavy Duty Silt Fence May Cause High Mortality in Large-bodied Snake Species

The Ministry of Natural Resources in Parry Sound advises Federal, Provincial and Municipal Government agencies, private construction, engineering and environmental consulting firms about the risk to large-bodied snake species posed by “heavy duty” silt fencing material used in construction practices in Ontario.

The use of “heavy duty” silt fence in areas where large-bodied snakes are found has been shown to cause high levels of mortality. For example, in one 30 metre section of “heavy duty” silt fence installed along the edge of a newly constructed road bed at a river crossing, two Eastern Massasauga Rattlesnakes and three Northern Watersnakes were found entangled and dead. **The Eastern Massasauaga is a nationally Threatened species.**

Any large-bodied snake could become entangled in the reinforcing mesh, including a number of species at risk: the Lake Erie Watersnake (**Endangered**), Eastern Foxsnake, Eastern Hog-nosed Snake, Black Ratsnake, Queen Snake (**Threatened**), and Eastern Milksnake and Northern Ribbonsnake (**Special Concern**).

Silt fencing is commonly used to control erosion in riparian areas along the shorelines of waterbodies, streams and wetlands. Riparian areas are favoured habitats for a number of Ontario's snake species.

Snakes may encounter the silt fencing where it has been erected across or along a movement corridor. They may also be attracted to the thermal properties of the material in order to regulate their body temperature.

The particular type of silt fence that is most dangerous to snakes is constructed with nylon mesh netting reinforcing the regular, woven plastic strand material. The nylon mesh is approximately one inch square. Large-bodied snakes become entangled in this mesh and perish.

There are ways to help prevent snake mortality. Better, on site management of temporary stockpiles of fill could preclude the need for reinforced silt fencing. Keeping fill material several metres back from the fencing helps prevent large volumes of soil from washing into the fence, weighing it down and knocking it over.

For further information contact:

Ron Black
Wildlife Biologist
Ministry of Natural Resources
7 Bay Street
Parry Sound, Ontario
P2A 1S4
(705) 773-4225

APPENDIX 5

Stage 1 and 2 Archaeological Assessment of MacDonald Avenue

And McNabb Stormwater Management Projects,

By Horizon Archaeological Inc.

Stage 1 & 2 Archaeological Assessment of MacDonald Avenue and McNabb Storm Water Management Project Part of Pin 0048, Block 31536 & Part of Pins: 0037, 0021, 0023, 0032 Block 31546, City of Sault Ste. Marie formerly Part Park Lot 10 Concession 3 & Part Park Lot 7 Concession2, Township of St. Mary, District of Algoma

P335-0036-2014

Prepared by:
Dayle A. Elder, MA (P335)
HORIZON ARCHAEOLOGY INC.
220 Chippewa St. West
North Bay, ON
P1B 6G2
Telephone: (705) 474-9864
E-mail:
dayle.elder@gmail.com (Licencee)
slattery@vianet.ca (HAI, North Bay)

Prepared for:
Pat McAuley
Tulloch Engineering
71 Black Road, Unit 8
Sault Ste. Marie, ON
P6B 0A3
705-949-1457
pat.mcauley@tulloch.ca

Date**:**
September 12, 2014

Type of Report**:**
Original

Executive Summary

This report describes the methodology and results of the Stage 1-2 Archaeological Assessment of the MacDonald Avenue and McNabb Storm Water Management Project, as part of a Municipal Class Environmental Assessment. This study was conducted under Archaeological Consulting License P-335 issued to Dayle A. Elder by the Ministry of Tourism, Culture and Sport for the Province of Ontario. This assessment was undertaken in order to recover and assess the cultural heritage value or interest of any archaeological sites within the project boundaries. All work was conducted in conformity with Ontario Ministry of Tourism, Culture and Sport (MTCS) *Standards and Guidelines for Consultant Archaeologists* (MTCS 2011) and the Ontario Heritage Amendment Act (SO 2005).

Horizon Archaeology Inc. was engaged by the proponent to undertake a Stage 1-2 Archaeological Assessment of the study area and was granted permission to carry out archaeological fieldwork by the owner's representative. The study area was subject to Stage 2 Assessment on September 03, 2014. The McNabb project area is located on Lot 7, Concession 2, St. Mary's Township, and runs roughly east-west between Pim Street and Gladstone Avenue, south of Bruce Street, and north of MacDonald Avenue. The project area is a steeply sloped ravine with a narrow meandering water course at its bottom. The rim and upper slopes of the ravine are forested with various sized trees, the lower slopes covered in scrub brush and shrubs, and the ravine bottom with tall flowers and grasses. The winding nature of the water course has formed a narrow discontinuous flood plain in the valley bottom. The largest single portion of the flood plain was located near the project area's southwest border, and measured approximately 10 metres long, and 3 metres wide.

The MacDonald project area is located on Lot 10, Concession 3 of St. Mary's Township, south of MacDonald Avenue, and extends south to Ontario Avenue. Like McNabb, the MacDonald project area was composed of a ravine with a narrow water course at the bottom. At Ontario Avenue, the project area extended to the east to Pine Street. The ravine bottom sloped to the south towards Ontario Street, and the water course in places was not well defined. The slopes of the ravine were tree covered, and the bottom was covered in long grasses. The ravine narrowed to less than two metres at its northern edge. Along Ontario Street, the project area was covered in large bushes and long grasses.

Owing to the narrow irregular flood plain on the McNabb project area, 5 m interval transects were not possible. Test-pits excavated were composed of wet grey soil, and filled with water during excavation. The MacDonald project area was wider and allowed test pitting at 5 m intervals throughout much of its extent, save at the north end where the ravine narrowed drastically. Along the ravine the test pits were composed of light brown wet soil, and water would seep from the test pit sides and bottom. In the south and eastern parts of this project area, test-pits were composed of gravel and sand fill, and were likely disturbed during road construction. No areas that were steeply sloped were subject to Stage 2 Test Pit Assessment.

Based upon the information gathered, Horizon Archaeology Inc is recommending that the MacDonald Avenue and McNabb Storm Water Management Project area requires no further assessment.

Table of Contents

Project Personnel

Consulting Archaeologist:	**Dayle A. Elder, MA (P335)**
Field Director:	**Dayle A. Elder**
Field Staff:	**Victoria Brooks-Elder, MA (P387)**
Photographs:	**Dayle A. Elder**
Archival Research:	**Victoria Brooks-Elder**
Report Preparation:	**Dayle A. Elder**
Maps:	**Proponent**
	Dayle A. Elder

List of Figures

List of Maps

1.0 Project Context

1.1 Objectives

The objectives of a Stage 1 archaeological assessment, as outlined by the Standards and Guidelines for Consultant Archaeologists (2011), are as follows:

1) To provide information about the property's geography, history, previous archaeological fieldwork and current land conditions
2) To evaluate in detail the property's archaeological potential, which will support recommendations for Stage 2 survey for all or parts of the property
3) To recommend appropriate strategies for Stage 2 survey

The objectives of a Stage 2 archaeological assessment, as outlined by the Standards and Guidelines for Consultant Archaeologists (2011), are as follows:

1) To document all archaeological resources on the property
2) To determine whether the property contains archaeological resources requiring further assessment
3) To recommend appropriate Stage 3 assessment strategies for archaeological sites identified

1.2 Development Context

This report describes the methodology and results of the Stage 1-2 MacDonald Avenue and McNabb Storm Water Management Project, as part of a Municipal Class Environmental Assessment. This study was conducted under Archaeological Consulting License P-335 issued to Dayle A. Elder by the Ministry of Tourism, Culture and Sport for the Province of Ontario.

Horizon Archaeology Inc was engaged by the proponent to undertake a Stage 1-2 Archaeological Assessment of the study area and was granted permission to carry out archaeological fieldwork by the proponent's representative. The proponent plans to develop two relatively small areas within the City of Sault Ste. Marie. The McNabb project area is located south of Bruce Street, running between Pim Street on the east and Gladstone Avenue on the west and is approximately 2.9 hectares in size. Located west of Pine Street the MacDonald Avenue Project Area runs between MacDonald Avenue on the north and Ontario Avenue on the south and is approximately 1.2 hectares in size (**Maps 1 & 2**). The study areas were subject to a Stage 2 assessment, on September 3rd 2014. The mapping provided by the proponent represents the best available.

All records, documentation, field notes and photographs related to the conduct and findings of the these investigations are held at the office of the licensee with copies at the Horizon Archaeology Inc office in North Bay until such time that they can be transferred to an agency or institution approved by the Ontario Ministry of Tourism, Culture and Sport (MTCS) on behalf of

the government and citizens of Ontario.

1.3 Historical Context

1.3.1 Pre-Contact Period

The archaeological chronology of Ontario has been divided up into three Pre-Contact periods: the Palaeo-Indian, Archaic, and Woodland, followed by an intermediate Contact, and finally the Euro-Canadian period.

The Palaeo-Indian sites date 10,000 to 5,000 B.C. , and inhabited a tundra like environment as the glaciers retreated northward. This means that some parts of the region were not ice-free until 6,000 B.C. (Dawson 1983:27-8). The Palaeo-Indians are believed to have been nomadic big-game hunters that followed migrating herds of caribou.

Palaeo-Indian sites date 10,000 to 5,000 B.C. , and inhabited a tundra like environment as the glaciers retreated northward. In such an environment, fruits, nuts and other sources of food harvested from trees or other plants are rare, and it is thought that the Palaeo-Inidans subsisted largely by hunting, trapping and fishing (Ellis 2013: 36). Palaeo-Indian sites are most often located on relic beach ridges associated with glacial lakeshores (Stork 1984). They have also been located at ancient river crossings, places where modern caribou hunters often assemble as the animals my slow and file through a narrow area making them easier to hunt (Ellis 2013: 36).

The predominance of sites being located on ancient strandlines may be more indicative of the survey methodology employed to find them rather than an actual preference for site situation on the part of the Palaeo-Indian peoples of Ontario, as a number of sites have been recovered away from ancient shorelines, for example 60 % of Palaeo-Indian sites in the west coast of Lake Superior were located along river-banks, indicating a more diversified strategy also focussing on fishing and possibly taking of waterfowl (Ellis & Deller 1990: 50, Fox 1975: 33-5, Julig 1994: 34).

Most Palaeo-Indian sites are small, indicating campsites that were inhabited briefly as its occupants followed the seasonal routes and cycles of their prey. Larger sites seem to be associated with migration routes, primarily at river crossing as mentioned above (Ellis 2013: 35-6).

Large, fluted spear points define an Early Palaeo-Indian site. While one of the earliest artefacts in North America, they are also one of the most technologically advanced stone tools on the continent (Ellis 2013: 37-8). Other artefacts encountered include hammerstones, and large choppers, knives / cutting tools, lunate bifaces, and piece esquillee's, possibly employed as wedges for wood or bone working, unifacial triangular end scrapers, beaked scrapers,

spokeshaves, burins or gravers (Ellis & Deller 1990: 43, 47-9).

Late Palaeo-Indian points do not exhibit the same fluting that is present on Earlier assemblages. Two point types are found on Late Palaeo-Indian sites, one group having a concave base with either rounded or pointed ears, and the other group comprising lanceoloate forms (Ellis 1990: 57-8). Most of the lithic tool kit continues from the Early Palaeo-Indian Period, however there a few new forms or tools that appeared, including: drills, and small thumbnail or fan shaped end scrapers replace the unifacial triangular end scraper (Ellis & Deller 1990: 59).

The toolstone recovered from Palaeo-Indian sites in Ontario has been sourced to have been quarried from sites up to 200 km away. However, there is evidence that sites were located specifically with regards to obtaining tool-stone as well (Fox 1975: 34-5, Julig 1994: 216). The tool stone was likely at least roughed out at the quarry site and carried to the site on seasonal routes. Other sources originated further afield from sources in Ohio or Michigan, and were likely obtained through trade (Ellis & Deller 1990: 43). These represent merely the tools manufactured from stone, as any tools made from bone etc would have decomposed over the intervening millennia (Ellis et al 1990: 66) .

Dating between 8000 and 1000 B.C., the Archaic period was a development of the Late Palaeo-Indian. Some typical Early Archaic artefacts have been found on Late Palaeo-Early Archaic sites in the province (Julig 1994: 176, Stork 1987). The Archaic peoples were still nomadic hunter-gatherers, however the greater range of tools has caused some to hypothesise that this indicated a shift from exploiting large-game over a large area to a more extensive, localised range (Ellis et al 1990: 67). This could also be a factor of preservation of perishable materials, as mentioned above. There is also evidence, through presence of imported / exotic cherts, that great distances were still covered during seasonal rounds (Ellis et al 1990: 78).

In southern Ontario, the Archaic is subdivided into Early, Middle, and Late periods, which in turn are further subdivided into horizons based upon point types (Ellis et al 1990). In northern Ontario, there is no such subdivision and the entire period is known as the Shield Archaic (Wright 1972, Hamilton 2013). Areas around the north shore of the Great Lakes, and along the southern border between northwestern Ontario could possibly have been part of the Middle Archaic "Laurentian Archaic" group found in southern Ontario (Hamilton 2013, Ellis et al 1990).

A major change in the Archaic tool-kit from that of the Late Palaeo-Indian period is the appearance of smaller, notched points that replace the large lanceolate forms. This has been thought to indicate a technological advance; the adoption of the spear-thrower, or *atl atl* . Other artefacts typical of the Archaic period include those associated with wood-working such as axes, gouges and adzes (Ellis et al 1990: 65). These woodworking tools have been thought to indicate that the dug-out canoe was introduced during this period.

The Archaic period also witnessed the rise of the "Old Copper" culture centred around Lake Superior."Old Copper" culture is a name given to the people from this area who exploited the available copper veins or outcroppings, and not a distinct Archaic group separate from others based upon material culture, settlement patterns etc. Copper artefacts from this area have been recovered from sites in Southern Ontario, west to into Saskatchewan, and south of Lake Michigan into Illinios (Hamilton 2013: 89). Copper artefacts include spear points, knives, chisels, and celts (Dawson 1966). Most of these artefacts have been found by collectors or out of context and their role in society is open for debate.

No Archaic houses have been identified archaeologically in northern Ontario; they are rare anywhere in the province. The Davidson Site (AhHk-54) along the Ausable River inland from Lake Huron in southern Ontario has revealed a number of features that have been identified as pit-houses, dating to the Late Archaic, predating 3000 BP based upon dates from carbonised remains found in flood deposits above the floor (Ellis et al 2010).

The house was circular, approximately 5 metres in diametre, had a sloping entrance, interior hearth, posts, and a bench surrounding the edges of the structure, and likely possessed a soil or sod roof. It was hypothesised that this structure was a cold weather domicile, owing to the greater insulating properties of pit-houses (Ellis et al 2010: 10). The labour involved in construction of such a house is also believed to indicate a more-or-less sedentary lifestyle, those occupying it relying on stored foodstuffs (Ellis et al 2010: 10).

Burials are also a rare find from the Archaic period. Two have been recovered from the northern reaches of northwestern Ontario, near Big Trout Lake, and date to approximately 5000 BC (Hamilton 2013:85). Burials from southern Ontario date to the Late Archaic, and have been divided into two complexes, the Haldimand and Glacial Kame. While it has been hypothesised that the Haldimand Complex groups interred their dead in what could be the first cemeteries in the province, it is fairly certain that the Glacial Kame culture had deliberate cemeteries to bury their deceased, possibly in an annual ritual or celebration (Ellis et al 1990: 116-8). Haldimand Complex burials included projectile points, chert bifaces, red ochre, copper artefacts including beads and awls, and beaver incisor grave goods (Ellis et al 1990: 116). Glacial Kame burials were composed both of inhumations as well as cremations. Grave goods were rather elaborate, and included bannerstones, bird stones, stone pipes, copper artefacts including adzes, awls and beads, bear maxilla masks, exotic sea shells, and gorgets (Ellis et al 1990: 116-8).

The Sault Ste. Marie area has revealed numerous Archaic period sites. These include the Grandmother Rocks Nanabush / Daigle Garden Site (CdId-4), a site that local First Nations associate with the Grandmother of Nanabush from Ojibwa mythology (ASI 2010: 7). Most sites recovered dated to the Late Archaic and were of lithic scatters, however sites have also yielded complete polished stone adzes, gouges, and a copper serpent effigy (ASI 2010: 7-8). The Money Musk Site revealed two hearths associated with a lithic scatter (ASI 2010: 7).

The Woodland Period is traditionally defined by the introduction of pottery, and as the period progresses, increasing sedentarism, and the introduction and growth of horticulture. Horticulture did not play a role in Woodland northern Ontario as the growing season is too short in most areas, and the soil unsuited to such undertakings. In Southern Ontario corn is considered to be the major crop grown during the Woodland period, and it may have been planted along the Boundary Waters area in Northwestern Ontario, as the micro-climates in the area there may have been suitable (Hamilton 2014: 92). Wild rice was harvested in other parts of the province (Dawson 1980:3, 1981: 34, Taylor-Hollings 1999:1, 100). This allowed for a similar predictable, annual, food source that was able to be stored and consumed over the winter, and allowed for larger population densities than previously (Taylor-Hollings 1999: 100).

In southern Ontario, the Woodland, like the Archaic period, has been subdivided into three phases, Early, Middle and Late, dating between ca. 1000 BC to and 1650 AD. In northern Ontario, the Woodland period has been subdivided into Initial and Terminal Woodland periods. This roughly corresponds to the Middle and Late Woodland periods encountered in the south. The time frame occupied by the Early Woodland in southern Ontario saw the continuation of the Shield Archaic in the Pre-Cambrian Shield area of Ontario.

The Initial Woodland period dates between 200 BC and 1000 AD (Dawson 1981, Hamilton 2013: 93), and the Terminal Woodland from 1000 AD to Contact with Europeans. Terminal Woodland ceramics have been found in conjunction with European trade goods, and have been C^{14} dated to the latter half of the 18^{th} Century (Dawson 1987:37). Throughout the province Ontario, the Woodland period is one of the best studied and understood, though the amount of research of the period in the north lags far behind that in the south.

The inhabitants of northern Ontario during the Initial Woodland period were the Laurel Tradition peoples. Early and Late manifestations of this tradition have been identified, the early phase dating between 200 BC and 500 AD, and the late 500 to 1000 AD. The Laurel Tradition occupies nearly all of the northern parts of the province, save for the very far north, and as far south in Ontario as Lake Nipissing and the French River. The Laurel Tradition spans north and eastern Manitoba, and a small part of Saskatchewan in the west, and extends into northern Quebec to the east, and into northern Minnesota and Wisconsin. Initial Woodland sites are often located along river banks or on the shores of lakes.

Laurel ceramics were produced from either a single lump of clay or by coil manufacture, grit tempered, a smoothed exterior, rims relatively straight with the lip either flattened or rounded (Wright 1967, Wilford Laboratory of Archaeology 2012). There are a variety of decorative techniques utilised on these vessels including a variety of incised, stamped, punctated, embossed, and cord-wrapped stick decorations (Wright 1967, Wilfrid Laboratory of Archaeology 2012).

In the Laurel ceramic sequence, pseudo-scallop shell impressed and combined decorative

techniques are considered early, and dentate stamped dragged, punctated, embossed, as well as plain ceramics are hypothesised to occur later in the period (Wright 1964: 100, Dawson 1980:54-5, 1981). Embossed ceramics which increase in frequency over the Initial Woodland, become a common motif on the succeeding Terminal Woodland Blackduck pottery (Wright 1964: 99, Dawson 1980: 32). The latest Initial Woodland ceramics are Laurel vessels that have Terminal Woodland Blackduck decorative motifs (Dawson 1980: 32).

Early in the Laurel sequence, projectile points continue to resemble the notched points of the Archaic period (Dawson 1981:3). These are later superceded by stemmed points (Dawson 1980: 55). Side scrapers dominate scraper types in the early phases, and end scrapers assume prominence in the later phases (Dawson 1980: 33). Other typical tools include stone biface blades, abraders, pottery decorating tools, and net sinkers, copper beads, awls, barbs, fragments, nuggets, pendants, projectile points, chisels, and bone awls, needles, knives which are usually manufactured from beaver incisors, pottery decorating tools, and beads (Wright 1967: 152, Dawson 1980:33, 1981: 34),

House plans for the Initial Woodland are rare, one having been very tentatively identified at the Heron Bay (DdIn-1) Site on the west bank of the near the mouth of the Pic River on the north shore of Lake Superior. The "house" plan consisted of a circular grouping of post-moulds approximately 3 metres in diametre, with no hearths or indications of other interior features (Wright 1967:8). Others have been identified in northwestern Ontario, and their plans formed by post-moulds and curved lines of stone approximately 7 metres long and 4 to 5 metres wide, and appear oval in plan view versus the circular form of the earlier Archaic period (Reid & Rajnovich 1982: 79, 103-4, 1983: 5-6). Hearths and pit features have been recovered from the interior of these house structures (Reid & Rajnovich 1982:103-4).

While not necessarily numerous, Initial Woodland Burials have been well-studied. This is because of their prominence in the landscape, often consisting of interments covered by earthen mounds of various sizes. These burial mounds are most common along the Rainy River, but other examples have been recorded south of Thunder Bay, and north to Red Lake (Kenyon 1986, Dawson 1981, Pelleck 1983). The mounds were constructed of relatively clean fill or sod over top of wooden cribbing or scaffold that contained the initial burials (Dawson 1981: 34, Wright 1986: 63-4). Remains of birch bark baskets have been recovered from the mound fill (Dawson 1981: 34, Wright 1986: 34). Subsequent burials, either primary inhumations or secondary burials, interred alone or in a mass burial have been recovered from the mound, and at its base (Wright 1986: 63). Some of the burials were coated with powdered red ochre, and grave goods included such items as lithic bifaces, ceramics, and exotic imports such as a monitor pipe, and an Ohio pipestone sucking tube (Dawson 1981:34, Wright 1986:64).

While the Laurel Tradition dominates the Initial Woodland period in northern Ontario, the Terminal Woodland fragmented into a number of different ceramic based Traditions or

Complexes: Blackduck, Selkirk Composite, and Sandy Lake/Psinomani Complex. The Rainy River Composite is a late Terminal Woodland complex found in the southwest of northwestern Ontario, northern Minnesota and southeastern Manitoba.

It has been hypothesised that these three different ceramic groups are the ancestors of today's Ojibwa (Blackduck), Cree (Selkirk), and Sioux (Sandy Lake).

The Sandy Lake ceramic tradition has been dated, with regional variations, between 1000 and 1750 AD. In northern Ontario, Sandy Lake ceramics likely date from 1200 AD (Gibbon & Anfinsons 2008). Sites with Sandy Lake ceramics are often associated with wild rice harvesting areas, and rice husking or 'jigging' pits have been recovered from Sandy Lake sites (Taylor-Hollings 1999: 1, 82, 100). The culture that utilised the Sandy Lake ceramics has been labelled "Psinomani", Dakota Sioux for wild rice gatherer (Taylor-Hollings 1992:6).

While Sandy Lake ware has been identified in Minnesota, North Dakota, southern Manitoba and eastern Saskatchewan, its distribution in Ontario is confined to the southern portion of the northwest part of the province, east from Lake Superior to the Lake St. Joseph region (Taylor-Hollings 1999:2). It is hypothesised that sites that contain small amounts of Sandy Lake ware versus other ware types may be indicative of trading, likely the wild rice that was contained inside rather than the pot itself (Taylor-Hollings 1999: 107).

Apart from wild-rice harvesting, the Psinomani utilised a variety of subsistence strategies: hunting of both land-based and aquatic mammals, local and migratory fowl, and fishing, as well as gathering wild 'crops' (Gibbon & Anfinsons 2008). It is possible that they also tapped maple trees for their sap (Taylor-Hollings 1999: 94-6). Bison bones have been identified from the Psinomani strata from the Long Sault site on the Rainy River, the furthest east that such remains have been recovered (Taylor-Hollings 1999: 96).

While no house plans have been recovered for Psinomani sites from Ontario, the faunal and botanical remains indicate that at least in some areas there was (semi-) permanent occupation of villages (Taylor- Hollings 1999: 108). Palisaded Psinomani villages have been excavated in Minnesota (Gibbon & Anfinsons 2008). Settlement type and locations indicate widely spaced settlement clusters, with a main village that housed up to 500 people in permanent base villages and small family rice harvesting, or foraging camps located close to the resource. Larger camps may have been formed for hunting larger game such as bison, elk, caribou or deer (Gibbon & Anfinsons 2008). No palisaded villages have been recovered from northwestern Ontario, however contemporary settlement patterning around Lake of the Woods may be similar to that encountered in Minnesota (Reid & Rajnovich 1980).

Sandy Lake pottery has a globular shape, and a slightly incurving and short vertical neck, with grit temper. Mussel shell has been identified in Sandy Lake ware from Minnesota, but is lacking

in its northern area of distribution. Decoration is rare, and confined to the neck and rim, consisting of incised lines, stamping, and exterior bosses / interior punctates (Wilford Laboratory of Archaeology 2010). Surface treatment or decoration has divided this ware group into three: that with vertical cord impressions is known as "Sandy Lake Corded", with a smoothed exterior has been labelled "Sandy Lake Smooth", and those vessels exhibiting a checked or stamped exterior is "Sandy Lake Stamped"(Taylor-Hollings 1999: 6).

Apart from an un-notched triangular projectile point, usually manufactured from quartz, the Sandy Lake / Psinomani tool kit did not differ greatly from the earlier Blackduck tool-kit (Taylor-Hollings 1999:82-3, 90-1, Gibbon & Anfinsons 2008).

The Selkirk Composite extends from north-central Saskatchewan, central Manitoba and northwest Ontario. It includes a variety of related regional complexes throughout these areas (McLean 1995: 78). Two Selkirk Complexes are present in Ontario, the Clearwater Lake Complex, and the Rainy River Composite, a late Selkirk manifestation in the southern part of Selkirk range around Rainy River and southeastern Manitoba (Mclean 1995: 79-81).

The Clearwater Lake Complex extends from northern Saskatchewan to at least the Albany River in northwestern Ontario, and was in existence between the 1300's and 1600's AD (McLean 1995: 80-85). It has been theorised that the northern Ontario Clearwater Lake Complex Selkirk may eventually form its own composite, as ceramics recovered have mixed Blackduck and Selkirk decorative motifs that are lacking from the other Clearwater Lake Complex sites (McLean 1995: 83). Laurel vessels with Selkirk decorative motifs have been recovered from Lake Nipigon (Dawson 1982:32).

Quartz formed the dominate tool-stone recovered from Clearwater Lake Complex sites (McLean 1995: 83). Triangular points have been recovered, however the majority were side-notched (McLean 1995: 83). End- and side scrapers, spokshaves, and bifacally flaked knives form the characteristic of the Clearwater Lake Complex lithic tool kit. Groundstone celts, adzes, net sinkers, abraders manufactured from slate, and hammerstones have also been recovered. Bone tools recovered include barbed harpoons, awls, scrapers, snow shoe needles, tubes, shaft straightners, beads, pendants, and moose jaw scrapers / snow knives, and antler flakers. Red Ochre has been recovered in raw form, as well as pigment decorating pottery (McLean 1995: 85).

Clearwater Lake Complex pottery is a thin (5-10mm thickness) grit-tempered ware, gobular in form, with a wide neck and vertical or outflaring rim (McLean 1995: 81-2). Decoration is limited to a row of punctates around the neck which formed interior bosses (McLean 1995: 81). Textile impressions are commonly found on the exterior of the vessels, even though most have gone through some degree of smoothing in the leather-hard stage (McLean 1995: 81).

Sandy Lake burials are divided into three types, intrusive burials dug into existing mounds,

primary mound burial where a flexed body would be placed into a pit with grave goods, and the site marked by a short conical stone mound, and interments without mounds (Taylor-Hollings 1999: 109).

Of the these Late Woodland ceramic complexes, Blackduck is the widest spread. It extends from Saskatchewan, through northern Ontario, east to Quebec, and south into the north half of Minnesota and Wisconsin. Evidence from excavations of campsites and burials indicates that the Blackduck tradition existed up to the period of European contact.

Blackduck ceramics are globular, and are more rounded than the other Late Woodland ceramics from northern Ontario, with a more constricted neck, and often have out-flaring rims. They are produced by the paddle and anvil technique, and tempered with grit. Decoration is usually limited to the interior and exterior of the rim, and the exterior neck. Decorative techniques include cord-wrapped stick stamping, "comb" stamping, punctuations of various kinds, and vertical brushing on the exterior rim surface. Distinctive of early Blackduck vessels is bossed decoration, a motif that appeared late in the Laurel sequence (Wilford Laboratory of Archaeology 2010, Wright 1967). Pottery of typical Blackduck manufacture but with Laurel design motifs have been recovered, and these have been dated to very early in the sequence, as early as 700 AD (Dawson 1982:32).

Non-ceramic artefacts considered typical of the Blackduck people include: clay pipes, stone oval and lunate chipped knives; side scrapers; trapezoidal, oval, and thumbnail end scrapers; tubular-shaped drills; steatite pipes; bone awls and needles; unilaterally barbed harpoon; spatulas antler flakers; beaver incisor knives; bear canine ornaments; and native copper fishhooks, gorges, and beads (Gibbon & Anfinson 2008).

An early Blackduck house was excavated in Kenora. Like the preceding Laurel houses, this was oval in plan measuring 9.5 x 5 metres, and contained a central hearths and three pits, but in this case was demarcated by postmoulds alone without any stone supports (Reid & Rajnovich 1983b: 5-10).

Blackduck burials continue the Initial Woodland tradition of mound burial (Kenyon 1986). When compared to the Laurel Tradition mounds from Long Sault and the Armstrong Mound, the Blackduck period mounds were lower, around 1to 1.5 metres high (Kenyon 1986). The initial burial phase often comprised of multiple secondary burials in a central pit, accompanied by grave goods. Unlike Initial Wooldand Mounds, which were constructed from clean sod and fill, Blackduck mounds were often constructed with refuse from hearths, or material from campsites (Wright 1986).

Evidence of scaffold exposure and de-fleshing of the remains has been identified (Kenyon 1986: 46-7). The bones were often wrapped in birchbark shrouds (Kenyon 1986: 44-72). Some of the

adult skulls showed evidence of having been covered with clay masks (Kenyon 1986: 56). Both adults and older sub-adults were found to have holes that had been incised in their occipital bones, likely to facilitate the removal of the deceaseds' brains (Kenyon 1986: 56). Powdered red ochre was distributed over burials. A 'roof' of logs was occasionally constructed over the pit, and a mound was constructed over top of this burial. If no wooden roof superstructure was installed, the burials were filled in with earth as the mound over top was constructed on top of them.

Hungry Hall Mound I when excavated, indicated it had bee reused after the initial interment, with two subsequent secondary mass secondary burials excavated into the mound. A final burial phase involved what has been hypothesised to be the construction of a funeral pyre, as cremated human remains, charred oak logs, ash and charcoal were recovered in the fill of the mound (Kenyon 1986: 44-6).

Grave goods included ceramic vessels, shell and bone beads, utensils and tools, sucking tubes made from exotic or imported stone, stone knives and scrapers. Later Blackduck burials have been found with copper kettles, bangles and awls, iron axes, knives and utensils, and glass beads that had been sewn onto bags or strung onto necklaces (Kenyon 1986: 67).

Northern Ontario was not completely isolated from the south. Late Woodland pottery originating in southern Ontario has been recovered from sites near Thunder Bay, Lake Nipigon, Sault Ste. Marie, Elliot Lake, and Lake Nipissing (Brooks 2013, Dawson 1983:53, Filteau 1978: 63, Noble 1979: 20-1, Robertson et al 1997: 17-23). Locally produced painted Middle Woodland pottery with parallels from southern Ontario has been recovered from Whitefish Island near Sault Ste. Marie (Adams 1979: 12-13). Locally produced Late Woodland pottery recovered from Sault Ste. Marie exhibits influence from southern Ontario in both form and decoration (ASI 2010: 9-10).

1.3.2 Post-Contact

The project area was part of the lands ceded to the Crown under the Robinson-Huron Treaty of 1850, which included the north shore of Lake Huron from Matchedash Bay to Batchewana Bay north to the height of land that separates the Great Lakes from the Arctic watersheds. The First Nations population of the entire treaty area was estimated at 1240 (Surtees 1986: 19). The First Nations around Sault Ste. Marie were given reserves at Batchewana Bay and Garden River. The size of the territory reserved for the two bands was decreased with the cessation of further lands in the Pennefather Treaty only nine years after Robinson-Huron (ASI 2010: 12).

First contact between Europeans and the local First Nations is believed to have taken place in 1607 when Etienne Brule travelled to the area. Information from the 1607 trip, as well as a later one in 1622 was used in Champlain's 1632 map of New France. The land was formally claimed for France in 1671, as part of their claim over all land west of Montreal.

A permanent Jesuit mission was established in 1669, and the area claimed as part of France's claim of dominion over all land west of Montreal. The site of the mission today is located on the Michigan side of the St. Mary River. It was at this time that the area was named Sault Ste. Marie, in honour of the Virgin Mary. Brule had named the area Sault du Gaston previously, in honour of King Louis' brother. The Jesuit mission was not successful. It was finally abandoned in 1689 under threat of Iroquois attack after numerous previous destruction and rebuilding episodes.

The fur trade, rather than religion was the impetus for the next European ventures into the area. In order to sever British trade with the First Nations, the French constructed a palisaded trading fort on the Michigan side of the river in 1750. This post was surrendered to the British in 1763 with the loss of their North American territory. Two independent traders took possession of the outpost ca. 1765.

The first European trade post to be constructed in Sault Ste. Marie Ontario was with the arrival of the Northwest Company in 1788. In 1797 the Northwest Company constructed a canal to by-pass the rapids and remove the need for a lengthy portage. The post and lock were destroyed by American invaders in 1814, however within a year the post had been repaired and was once again in operation. The canal was not similarly repaired.

The Northwest Company post was taken over by the Hudson's Bay Company (HBC) after the merger of the two firms in 1821. The importance of the post in the fur trade went into decline, as the HBC preferred to ship furs from Hudson's Bay. The post was operating at a loss by 1828, but remained in operation in order to maintain good relationships with the local First Nations, and prevent the incursion of rival traders. The focus of the post shifted to supplying local settlers and shipping of fish. The post was ultimately closed in 1869.

Sault Ste. Marie's population remained fluid for much of the early 19th Century, with the rise and fall of the timber and mining industries in the region. One of the deterrents to settlement was believed to be the inability to purchase land, as no treaty had been signed with the local First Nations. With the signing of the Robinson-Huron Treaties, land was opened for survey and settlement. Local government was established with the creation of the Judicial District of Algoma in 1858.

Settlement in the area increased dramatically after the establishment of the Free Grants Act in 1868, with Sault Ste. Marie serving as a hub for east-west travel and communication. The creation of a canal on the American side greatly facilitated transit, however in times of political strife, access to transit the canal was denied by the American government. A canal on the Canadian side was opened in 1895.

With the arrival of the Algoma Branch of the Canadian Pacific Railway in the 1887, Euro-Canadian settlement increased markedly, many of the people taking advantage of free land grants

with the promises of fertile soil for farming (Commissioner of Crown Lands 1884: 16, Algoma Land & Colonization Co. Ltd. 1892) . Fertile soil proved to be lacking, and many people turned to other industries for employment.

A major force in the development of Sault Ste. Marie was Francis H. Clergue. Between 1894 and 1903, Clergue and his companies operated the hydro-electric plant, with a contract to supply the town and all businesses located in it, the Ontario Pulp and Paper Company, the Tagona Water & Light Company including a contract to supply water to the town for two decades, a sulphite mill, which necessitated the purchase of a nickel mine, and the Algoma Steel Company created in 1901, beginning Sault Ste. Marie's association with steel production. Of course, Clergue owned a number of the newly discovered iron mines in the area. As with any good 19th Century industrialist, Clergue was also heavily involved in the development of railroads.

Clergue's companies were organised under the umbrella of the Consolidated Lake Superior Corporation by 1902. Financial difficulties forced Clergue to give up his companies in 1903, and after an unsuccessful attempt to regain control in 1904, he left Sault Ste. Marie in 1908, returning once in the 1920's and 1930's to attend public functions.

1.3.3 Study Area Specific History

St. Mary Township was surveyed in 1859, and divided into sections and Park Lots. In 1887 much of the township, up to Park Lots on Concession 3 was annexed to the town of Sault Ste. Marie. This includes the study areas. In 1902 the northern-most Park Lots on Concession 4 became part of Tarentorus Township when it formed its own municipality.

The area comprising the MacDonald project area was part of 50 acres on Lot 7 Concession 2 patented to John McNab (also spelled McNabb and MacNabb on the Patent Plans) on June 24th 1857. McNab, his wife Anna, and R. Dalton mortgaged the whole Lot to Stephen Richardson on May 10th 1862 for $1200 a month. The mortgage was discharged July 6th 1874. The Grantees for the mortgage's discharge are R. Dalton and Mrs. Anna McNab. John McNab died earlier the same year, his will being probated on July 15th 1874. Interestingly, Mrs. McNab and Dalton mortgaged the whole lot to Joseph Donaldson on June 8th 1874 for $8000 prior to Stephen Richardson's mortgage being discharged. Anna McNab issued Donaldson a bill of sale for the whole lot on the same day.

After the sale of Lot 7 Concession 2 to Donaldson, the land seems to have been rapidly subdivided, however there are no indications of the location of the severances. **Table 1** gives a list of the land transactions from the original patent to John McNab until 1932, after which point the transactions deal with the sale of a variety of house lots without description of their location.

No records for Lot 10 Concession 3 were able to be located.

Table 1: Lot 7 Concession 2 Township of St. Mary Land Transactions 1857-1932.

No. of Instrument	Instrument	Its Date	Date of Registry	Grantor	Grantee	Quantity of Land	Consideration or Amount of Mortgage	Remarks
	Patent	24th June 1857		Crown	John McNab			50 Acres
52	M	10th May 1862	17th May 1862	J. McNab & R. Dalton	Stephen Richards		$1,200	Whole Lot
241	D of M	6th July 1874	18th Sept 1874	Stephen Richards	R. Dalton and Mrs. A (Anna) McNab		Ditto	Ditto
242	M	8th June 1874	18th Sept 1874	Joseph Davidson	Ditto Ditto		$8.000	Ditto
243	B + S	8th June 1874	18th Sept 1874	Anna McNab	Joseph Davidson		$12,500	Ditto
9	Probate of Will	15th July 1871	20th Oct 1874	John McNab				
500	B + S	23 May 1881	4 June 1881	Joseph Davidson et ux	Helen Leys		$10,000.00	9/20ths undv'd 19 Lots
501	M	4 May 1881	4 June 1881	Helen & John Leys	Henry Taylor		$20,000.00	~
10	By Law	7 Feb 1882	15 Mch 1882	Mun. Sault Ste. Marie	Mun. Sault Ste. Marie			N 33 x 990 ft Road
Awenge 15	M	1 Oct ~	9 Nov ~	R. Laird et ux & W.H. Laird	John Laird		$10,000.00	7/32 interest 14 Lots

No. of Instrument	Instrument	Its Date	Date of Registry	Grantor	Grantee	Quantity of Land	Consideration or Amount of Mortgage	Remarks
28	D of M	11 Aug 1885	26 Sept 1885	John Laird	R. & W.H. Laird		~	~ no. 15
R.S. 692	B + S	5 June ~	~ ~ ~	Robt Laird et ux	Wm. H. Laird		$1.00	7/64 ~
T.A 29	M	23 July ~	~ ~ ~	Wm. H. Laird	John Laird		$5,000.00	~ ~
T.A. 30	~	~ ~ ~	~ ~ ~	Robt Laird et ux	~ ~		$5,000.00	~ ~
~ 51	A of M	Oct 1 /87	Oct 19 /87	Henry Tayler	Ont. Inv. Assoc		$200.00	9/20 No. 501
~ 91	Lib Pen	Nov 8 /87	Nov 14 /87	Thos. Robertson & Co et al	R.H. Laird et al			
111	~	Nov 19 /87	Nov 29 /87	~ ~ ~ ~	~ ~ ~ ~			
408	B + S	Oct 8 /87	My 5 /88	H.E. Leys et ux et al	Ont. & SS Marie	2 20/100	$5,000	Several
452	QC	Dec 6 /88	My 22 /88	Robt Laird et ux	W.H. Laird		$10,000	7/64 un int 14 Lts
64	Pt D of M	Aug 28 /88	Sep 17 /88	Ont Inv Assoc	Helen E. Leys	2 24/100		Pt. 501
66	~ of R	Sep 4 /88	~ ~ ~	Ont Inv Assoc	Cana Pac R co			9/20 int pt
73	~ of M	Oct 15 /87	~ ~ ~	John Laird	Robt Laird			7/64 in 2 20/100 Pt. T.A. 30

No. of Instrument	Instrument	Its Date	Date of Registry	Grantor	Grantee	Quantity of Land	Consideration or Amount of Mortgage	Remarks
illegible	~	~ ~ ~	~ ~	~ ~	W Laird			~ ~ ~ ~ 29
illegible	~	Mch 3 /87	~ ~ ~	R.G. Dalton & A. McNab	Jos. Davidson			~ ~ ~ no. 242
113	Tis Pens	Jan 19 /89	Jan 24 /89	Hugh McDonald	J. Laird & R.H. Laird- Davidson			
242	M	Dec 29 /89	Mar 9 /89	John Leys	Dominion Law Inv Loc		$50,000	und 9/20 int
382	B + S	Dec 8 /88	Ap 29 /89	Helen E. Leys	John Leys		$50,000	~ ~ ~ other lots
2026	D of Tis Pen	Feb 27 /90	Mch 1/90	Hugh MacDonald	J. Laird & H. Laird-Davidson			
2034	B + S	Sep 30 /89	Ap 14 /90	John Leys et ux et al	Cand Pc Rl Co		$3750	Pt Rt of W CPR
2119	Tis Pen	May 17 /90	May 21 /90	Joseph Lowrie	R.H. & W.H. Laird, Jos Davidson			(see order vacating Lic Pen ....) MLH July 3 /29
2124	B + S	Ap 1 /90	May 28 /90	W.H. Laird et ux	Cand Pac R Co	Pt.	$704	R of Way
2131	~	Jan 20 /90	June 3 /90	Jos. Davidson et ux	W.H. Laird		$1	9/64 int
2165	Pt D of M	~ 29 /90	~ 27 /90	John Laird	W.H. Laird			7/64 no 29

No. of Instrument	Instrument	Its Date	Date of Registry	Grantor	Grantee	Quantity of Land	Consideration or Amount of Mortgage	Remarks
2263	M	July 7 /90	Sep 18 /90	Robt Laird et ux	A.L. Laird		$1200	~ ~
2301	B + S	Dec 2 /90	Oct 25 /90	W.H. Laird et ux	Robt Laird		$10000	~ ~
2355	M	Nov 20 /90	Jany 39 /90	Robt Laird et ux	W.H. Laird		$3000	7/64 int
3206	Plan	May 1 /93	May 18 /93	Ley Sub				See 7^{7} for 119
3424	Cert of Ord	May 12 /94	May 25 /94	John Laird vs	Cand Pac R Co	Pt		
4839	B + S	Jany 11 /97	Mar 2 /97	Ont SS Marie RR Co	Chas. M Hays Trts			
3816	Pt D of L Pens	Nov 7 /93	Augst 19 /95	Thos. Robertson & A. Ass	Jos. Davidson			No 91 -
3817	~ ~	~ ~	~ ~	~ ~ ~	~ ~			No 111
4839	B + S	Jany 11 /93	Mar 2 /97	Ont SS Marie RR Co	C.M. Hays (Trust)	2 24/100 ac	$1	
6977	B + S	Jany 15 1901	Jany 31 1901	Chas. M. Hays (Trust)	Geo. B. Reeve Trustee	pt	$1	
7535	D of M	May 2 1901	May 29 1901	John Laird	H. Laird	7/64 int		no 29 -

No. of Instrument	Instrument	Its Date	Date of Registry	Grantor	Grantee	Quantity of Land	Consideration or Amount of Mortgage	Remarks
7544	QC	Apr 28 /888	May 30 /901	S.M. Thomson executrix A.C. Thompson	Wm. H. Laird		$1	
8439	B + S	Dec 25 -01	Dec 27 /01	Geo. B. Reeve Trustee	Chas. M Hays Trustee	Pt	$1.00	Same as 408
9012	D of M	Apr-24-01	May-5-02	Ontario Investment Co	F.B. Leys			no. 501-
22151	B + S	June 9/13	July 8/13	Clara G. Hays Ex of C.M. Hays	E.J. Chamberlin		$1 and Premises	Pt other Lots
27263	~	Feb 5/17	Apl 29/17	E.J. Chamberlain	Grand Trunk Ry Co		$1 previous	pt
36050	Certificate of Discharge of Lic Pendias	Mar 19 1926	Apr 3 1926	The Alpha Oil Gas & Mining Co of on (illegible) Thos Robertson who are as well on their own behalf as on behalf of all other directors of R.H. Laird	Robt. H. Laird and Joseph Davidson	other lots		

No. of Instrument	Instrument	Its Date	Date of Registry	Grantor	Grantee	Quantity of Land	Consideration or Amount of Mortgage	Remarks
38667	Grant	Oct 25 /29	Dec 28 / 29	Can National Ry Co	Can National Realties Ltd	~	$2.00	Pt being strip 100' wide see deed
40134	Lieu	Feby 16/32	Feby 16 /32	Jn E. Rewcastle Neil Tume (?) Can(illegible) of business under former name of Rewcastle France(?)	Augustus Selumnowski & Lenard PilKurdiftori(?) Can National Realties Ltd	~	$635.20	Pt ~ ~ ~ ~ see Lieu
40139	Lieu	Feby 19 /32	Feby 24 /32	Taylor Taylor Ltd (?)	Soo Winter Playground, A.F. Selumnowski, and Henson(?) Lumber Co. Ltd	~	$309.91	Pt 2 Lots see Lieu
40143	Lieu	Feby 25 /32	Feby 25 /32	Archibald G McDonald	Soo Winter(?) Playground, A.F S(?)owski & Hess(?) L Co Ltd		$176	Pt 2 Lots see Lieu

No. of Instrument	Instrument	Its Date	Date of Registry	Grantor	Grantee	Quantity of Land	Consideration or Amount of Mortgage	Remarks
40147	ceil.	Mar 3 /32	Mar 3 /32	Jn E Rewcastle O Neil Terr(?) ca(?) business under name of Rewcastle, Terrace, Rewcastle Fournier (?)	Augustus S(?)owski, Leonard Pilk..(?) Can Natn R Ltd	merlauds (?)	$610.23	Pt being strip 100' wide for (illegible)
4023	Ceil	Apr 29 /32	Apr 29 /32	Archibald G McDonald	Soo Winter (?) Playground & A.F. S(?)owski, Henson(?) L Co		$167.00	Pt 2 Lots see cert (?)

1.3.4 Maps

Champlain's map of 1632 depicts the Sault Ste. Marie Area, which shows the St. Mary's River with a group of First Nations cabins along it (Champlain 1632). A 1653 map of the area names the rapids "Sault St. Pierre" (Duval & Champlain 1653).

The two properties under assessment were originally part of St. Mary Township. The 1859 patent map of St. Mary and Tarentorus Townships show a Jonathan MacNab owning Lot 7 Concession 2, the McDonald project area and a Henry C.R. Becher on the McNabb project area on Lot 10 Concession 3. The same names appear on another undated map of St. Mary's Park Lots as well. On this second map, the watercourse that goes through the centre of the McNabb project area is depicted.

An 1855 map of Sault Ste Maire depicts the project areas, and again shows the McNabb project area's watercourse flowing through Pewabic Mountains to the southwest and into the St. Mary's River (Whitney & Colton 1855). Modern maps depict this water course as intermittent, and not flowing all the way to the river.

NTS Mapsheet 41K9 did not yield any further information on the project areas.

1.3.5 Summary of Historical Context

Situated on the St. Mary's River Sault Ste. Marie has seen continuous habitation for thousands of years as the First Nations harvested fish along the river and the rapids that gave the modern city its name. Early explorers mention the large number of First Nations who lived, traded and fished in the area.

The earliest European settlement came in form of a short-lived Jesuit mission. This was followed by fur-traders who used the St. Mary's River as part of the fur-highway connecting Montreal with the North American interior. A trading post was established by the French in the 18th Century, to be taken over by independent traders after 1763. This trading post was superceded by the Northwest Company's post, which was taken over in 1821 by the Hudson's Bay Company after the two companies merged.

Sault Ste. Marie struggled to maintain a steady population as the fur trade waned, partly because of the lack of land available for settlement. The Robinson-Huron Treaty opened up land for settlement, followed by the establishment of the District of Algoma. Free land grants enticed people to the region, however much of the land proved unsuitable to agriculture, and settlers migrated to the mining and lumber industries for employment. These industries proved unreliable as timber stands were depleted and mines opened and closed, causing Sault Ste. Marie's population to fluctuate markedly.

American industrialist Francis H. Clergue arrived in Sault Ste. Marie in the late 19th Century, and either resuscitated or founded a series of companies that put the city on a firm industrial footing. Cleurge lost control of his companies by 1904 after they suffered a series of cash flow problems.

The project areas were initially part of St. Mary's Township, which was relatively rapidly absorbed into the City of Sault Ste. Marie. Each project area was initially owned by people who owned multiple properties in the township, but records were only available for the MacDonald project area that was initially patented to John McNabb. The property was rapidly subdivided afterwards.

1.4 Archaeological Context

1.4.1 Current Conditions

The McNabb project area is located on Lot 7 Concession 2 St. Mary's Township, and runs roughly east-west between Pim Street and Gladstone Avenue, south of Bruce Street, and north of MacDonald Avenue. Immediately north of the project area is a public park, to the south an abandoned school and grounds, and the parking lot of the Our Lady of Good Counsel Roman Catholic church. The project area is a steeply sloped ravine with a narrow meandering water course at its bottom (**Figures 1-3**). The rim and upper slopes of the ravine are forested with various sized trees, the lower slopes covered in scrub brush and shrubs, and the ravine bottom with tall flowers and grasses. The winding nature of the water course has formed a narrow discontinuous flood plain in the valley bottom. The largest single portion of the floodplain was located near the project area's southwest border, and measured approximately 10 metres long, and 3 metres wide (**Figure 4**).

The MacDonald project area is located on Lot 10 Concession 3 of St. Mary's Township, south of MacDonald Avenue, and extends south to Ontario Avenue. Like McNabb, the MacDonald project area was composed of a ravine with a narrow water course at the bottom. At Ontario Avenue, the project area extended to the east to Pine Street. The ravine bottom sloped to the south towards Ontario Street, and the water course in places was not well defined (**Figures 5 & 6**). The slopes of the ravine were tree covered, and the bottom was covered in long grasses. The ravine narrowed to less than two metres at its northern edge (**Figure 7**). Along Ontario Street, the project area was covered in large bushes and long grasses (**Figure 8**).

1.4.2 Physiography

The bedrock of the project areas is a mixture of sandstone and undifferentiated limestone and shale (Ontario Department of Mines 1966). Both project areas' soil is composed of Tavistock Till (SSMRCA 2011). Both Project areas are located on the edge of the Korah Strandline. This ancient beach ridge was formed between 10,500 and 10,000 B.C. (ASI 2011: 58-60, Figure 57).

1.4.3 Previous Archaeological Assessments

No archaeological assessments have taken place within the bounds of the project area, nor adjacent to it.

Archaeological Services Inc has created an archaeological master plan for the City of Sault Ste. Marie (ASI 2011). This document examined a variety of factors including known archaeological sites, historical documents, palaeoenvironmental studies, geology, physiography, and hydrology to determine areas within Sault Ste. Marie that are considered as containing high archaeological potential. Both the McNabb and MacDonald project areas were classified as zones of high archaeological potential (ASI 2011: Figure 79).

1.4.4 Registered Archaeological Sites

A request of the MTCS data base yielded 2 archaeological sites within 1 kilometre of the study area (von Bitter 2014). The two sites are the Curran Site (CdIb-3), and the Mystery Hand Site (CdIb-4).

The Curran Site (CdIb-3) Site was an Archaic campsite located near a beach ridge, and artefacts comprised of a single stone axe found while a yard was being dug up for the installation of drainage tile in the 1920's. The Curran Site was located roughly between the two project areas.

The Mystery Hand Site (CdIb-4), now covered by a public utilities commission building was an early contact site that comprised of a hand created out of 'sponge', or impure iron, as well as a brass cross that is thought to be part of a portable altar. The site has been dated to 17th Century.

2.0 Field Methods

The project areas were located in high potential areas, with water courses running through them, and in close proximity to an archaeological site. Stage 2 Assessment took place on Tuesday, September 2nd 2014 under predominantly sunny skies. Temperatures ranged between a low of 13° and a high of 24° Celsius. Fieldwork was not affected by unfavourable conditions that would reduce ability to identify and document any part of the archaeological site, as laid out in Section 3.2 of the 2011 Standards and Guidelines for Consultant Archaeologists (MTCS 2011: 25). The maps and plans contained in this report represent the best available and reflect those which will be used in the proponent's application.

Owing to the narrow irregular flood plain on the McNabb project area, 5 m interval transects were not possible. Test-pits excavated were composed of wet grey soil, and filled with water during excavation (**Figure 9**). The MacDonald project area was wider and allowed test pitting at 5 m intervals throughout much of its extent, save at the north end where the ravine narrowed drastically. Along the ravine the test pits were composed of light brown wet soil, and water would seep from the test pit sides and bottom **(Figures 10 & 11**). In the south and eastern parts of this project area, test-pits were composed of gravel and sand fill, and were likely disturbed during road construction (**Figure 12-15**). No areas that were steeply sloped were subject to Stage 2 Test Pit Assessment.

Approximately 45% of the McNabb Project Area was found to be low-lying and wet, and the remaining 55% was comprised of steeply sloping topography (**Map 3**). The MacDonald Project Area was composed of 60% steep slope, 20% low-lying and wet, and 20% disturbed (**Map 4**).

3.0 Record of Finds

No artefacts nor subsurface features were identified.

4.0 Analysis and Conclusions

4.1 Conclusions

No archaeological sites were identified during Stage 2 Assessment.

5.0 Recommendations

It is therefore recommended that the McNabb and MacDonald Storm Water Management project area requires no further assessment.

6.0 Advice on Compliance with Legislation

This report is filed with the Ministry of Culture as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c. 0.18. The report is reviewed to ensure that is complies with the standards and guidelines that are issued by the Ministry, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matter relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism and Culture, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Section 48 and 69 of the Ontario Heritage Act for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such a time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the Ontario Heritage Act.

Should previously unknown or deeply buried archaeological resources by uncovered during development, they may be a new archaeological site and therefore subject to Section 48 (1) of the Ontario Heritage Act. The Proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologists to carry out archaeological fieldwork, in compliance with Section 48 (1) of the Ontario Heritage Act.

The Cemeteries Act, R.S.O. 1990 c. C.4 and the Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the Ontario Heritage Act and may not be altered, or have artifacts removed from them, except by a person holding an archaeological license.

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8.0 Images

Figure 1: McNabb Project Area from Northeast Corner. Facing West.

Figure 2: McNabb Project Area from Southwest Corner. Facing East.

Figure 3: McNabb Project Area, Watercourse. Facing Southeast.

Figure 4: McNabb Project Area Floodplain. Facing East.

Figure 5: MacDonald Project Area, Steep Slope. Facing South.

Figure 6: MacDonald Project Area. Facing North.

Figure 7: MacDonald Project Area, Northern Border. Facing South.

Figure 8: MacDonald Project Area, East Arm. Facing West.

Figure 9: McNabb Project Area Wet Test Pit. Facing East

Figure 10: MacDonald Project Area Test Pit. Facing West.

Figure 11: MacDonald Test Pit Profile. Facing West.

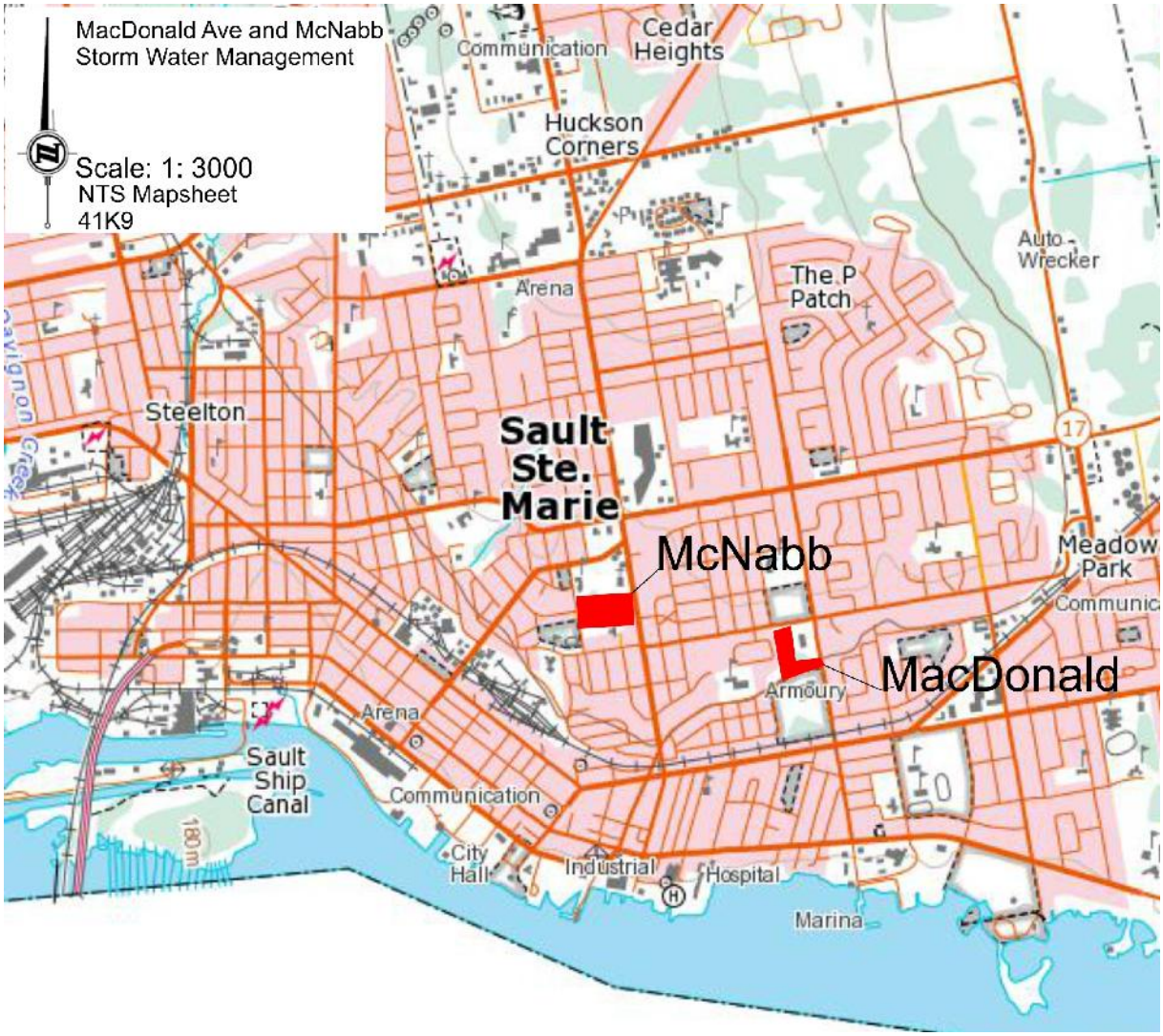
Figure 12: MacDonald Project Area Disturbed Test Pit Plan. Facing East.

Figure 13: MacDonald Project Area Disturbed Test Pit Profile. Facing West.

Figure 14: MacDonald Project Area Disturbed Test Pit. Facing West.

Figure 15: MacDonald Project Area Disturbed Test Pit Profile. Facing West.

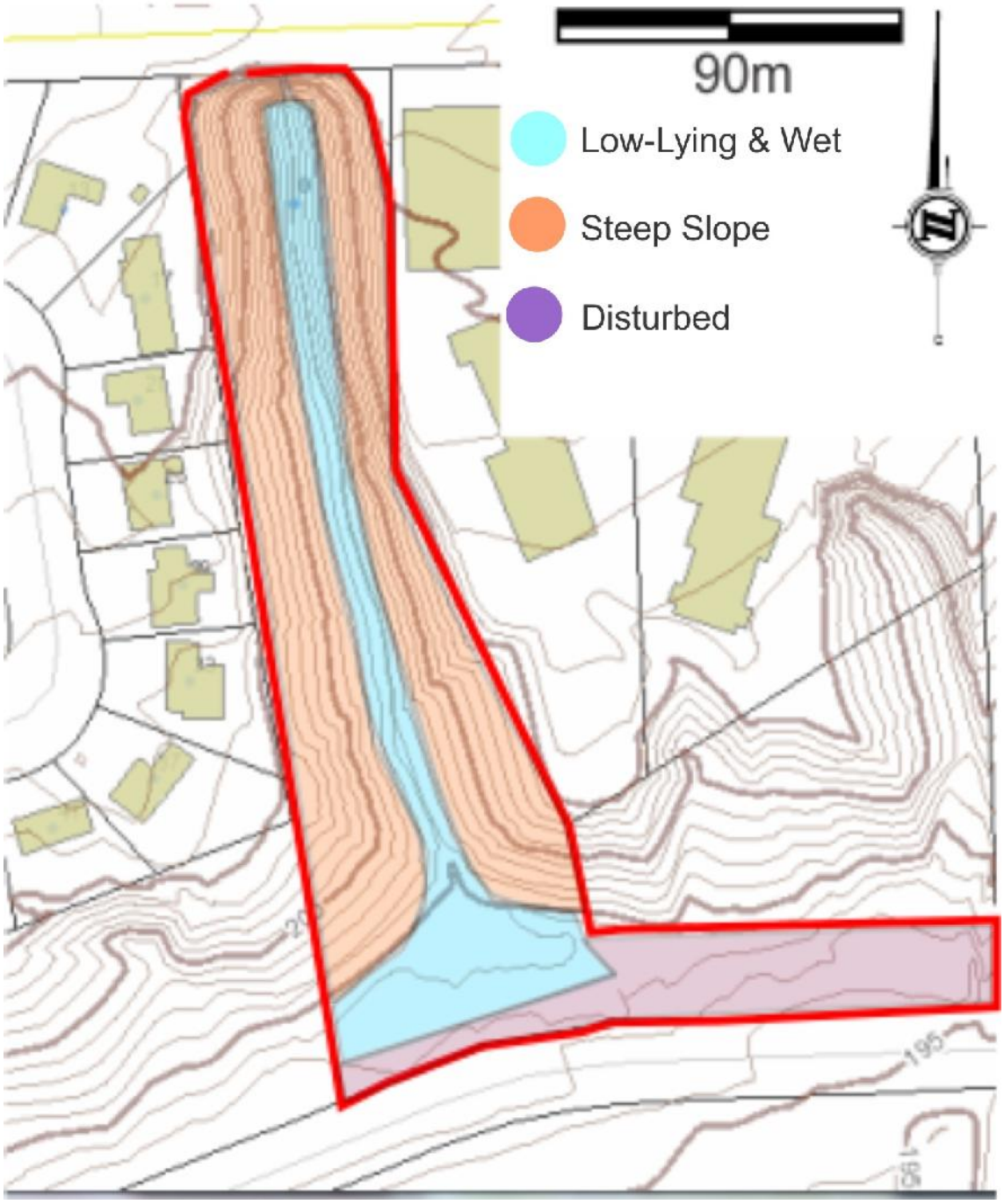
9.0 Maps



Map 1: Project Area Locations.

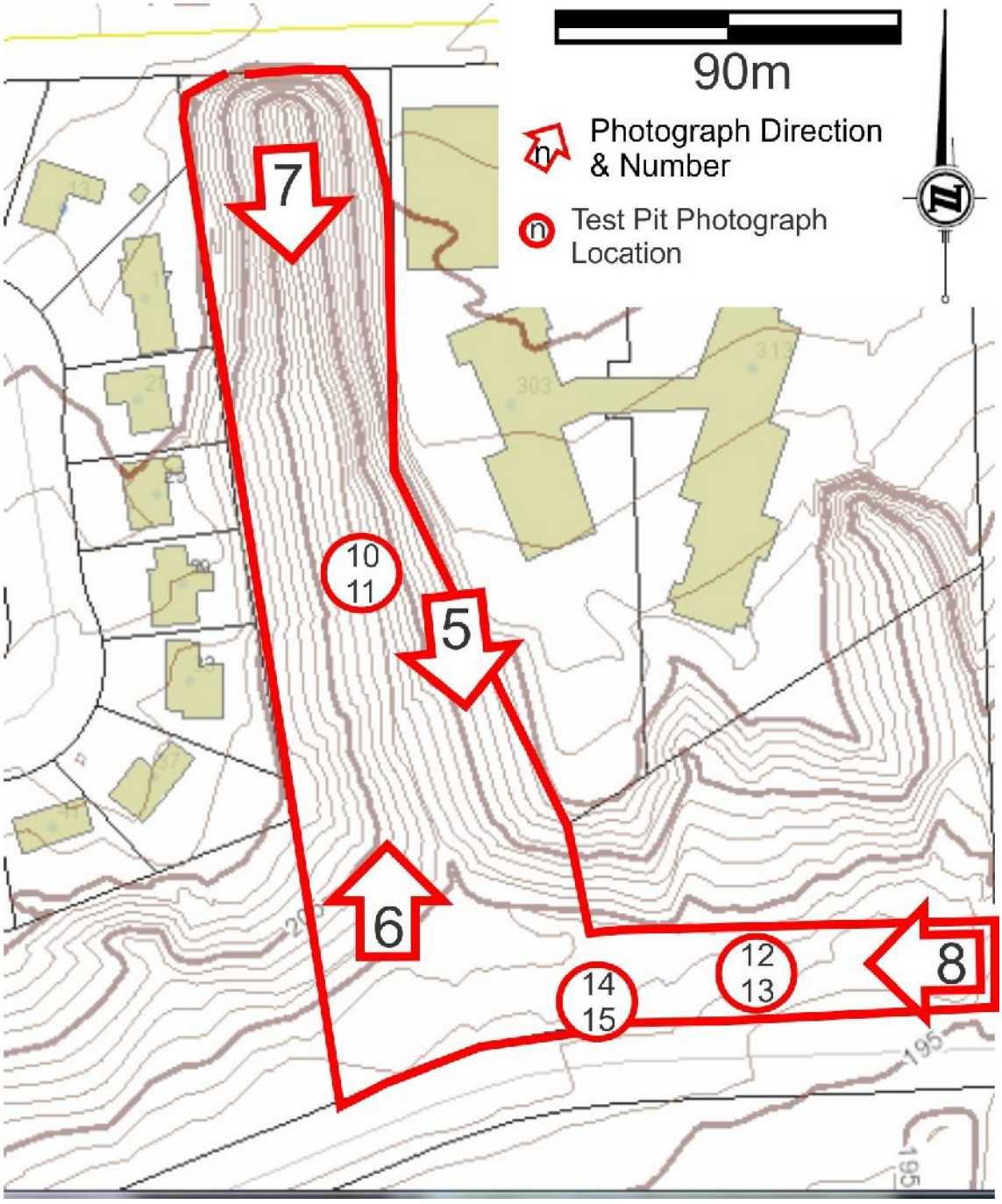
Map 2: Proponent Supplied Development Map.

Map 3: McNabb Project Area



Map 4: MacDonald Project Area

Map 5: McNabb Project Area with Figure Numbers and Direction Mentioned in Text



Map 6: MacDonald Project Area with Figure Numbers and Direction Mentioned in Text.

Appendix 1
Documentary Record Generated in the Field

The documentary record generated in the field during the MacDonald Avenue and McNabb Storm Water Management Project includes four pages of handwritten notes and sketch maps, GPS points and 44 digital photographs.

Exposure Number	Subject
DSCF0885	Photoboard
DSCF0886	McNabb Project Area
DSCF0887	McNabb Project Area
DSCF0888	McNabb Test Pit
DSCF0889	McNabb Test Pit
DSCF0890	McNabb Test Pit
DSCF0891	McNabb Test Pit
DSCF0892	McNabb Creek/Ravine Bottom
DSCF0893	McNabb Ravine Bottom
DSCF0894	McNabb Ravine Bottom
DSCF0895	McNabb Steep Slope
DSCF0896	McNabb Creek/Ravine Bottom
DSCF0897	McNabb Steep Slope
DSCF0898	McNabb Project Area
DSCF0899	McNabb Steep Slope
DSCF0900	McNabb Ravine Top
DSCF0902	McNabb Ravine Edge
DSCF0903	McNabb North Project Boundary
DSCF0904	McNabb North Project Boundary
DSCF0905	McNabb Ravine Bottom
DSCF0906	McNabb Ravine Looking to Bottom
DSCF0907	McNabb South Project Boundary
DSCF0908	MacDonald Project Area Photoboard
DSCF0909	MacDonald Project Area
DSCF0910	MacDonald Project Area

Exposure Number	Subject
DSCF0911	MacDonald Steep Slope
DSCF0912	MacDonald Steep Slope
DSCF0913	MacDonald Ravine Creek/Ravine Bottom
DSCF0914	MacDonald Steep Slope
DSCF0915	MacDonald Project Area
DSCF0916	MacDonald Steep Slope
DSCF0917	MacDonald Wet Test Pit Plan
DSCF0918	MacDonald Wet Test Pit Profile
DSCF0919	MacDonald Low-Lying and Wet Ground Surface
DSCF0920	MacDonald Ravine Bottom
DSCF0921	MacDonald Narrow Northern Part of Project Area
DSCF0922	MacDonald Narrow Northern Part of Project Area
DSCF0923	MacDonald Disturbed Southern Part of Project Area, Cement / Concrete Rubble
DSCF0924	MacDonald Disturbed Test Pit Plan
DSCF0925	MacDonald Disturbed Test Pit Profile
DSCF0926	MacDonald Disturbed Test Pit Plan
DSCF0927	MacDonald Disturbed Test Pit Profile
DSCF0928	MacDonald Southern Part of Project Area

APPENDIX 6

Public Open House #2 Information

Notice of Public Consultation Centre

Flooding in the McNabb Street and MacDonald Avenue Areas

The City of Sault Ste. Marie has initiated two Class Environmental Assessments (EA's) to review the storm water drainage system in the vicinity of McNabb Street east of Pim Street and on MacDonald Ave near Brien Avenue.

These projects are being planned as Schedule 'C' projects under the Municipal Class Environmental Assessment process.

Study Area #1 - McNabb St

The storm water drainage system in the vicinity of McNabb Street, Pim Street and Willow Avenue is being reviewed. The intent of the study is to determine the preferred method of reducing the frequency of local flooding in the lower Willow Avenue, McNabb Street and upper Pim Street areas. Alternative solutions were presented in a January 2014 Information Session, which have now been evaluated. The preferred solution involves storm sewer improvements between McNabb St and Pim St through Poplar Park and the parking lot of the Canadian Motor Hotel, in combination with temporary storage of excess storm water in the ravine running between Pim St and Gladstone Ave, south of 415 Pim St (Great Lakes Honda). The study area has been expanded to include properties bordering on the ravine.

Study Area #2 - MacDonald Ave

The intent of this study is to determine the preferred method of reducing the frequency of local flooding on MacDonald Avenue between Poplar Avenue and Alworth Place. Alternative solutions were presented in a January 2014 Information Session, which have now been evaluated. The preferred solution involves storm sewer improvements on MacDonald Ave to drain excess storm water into the ravine running between MacDonald Ave and Ontario Ave, where it will be stored temporarily in the ravine before discharge into the Pine St storm sewer system. The study area has been expanded to include properties bordering on the ravine.

A key component of the study is consultation with interested stakeholders (public and review agencies). A Public Consultation Centre will be held:

Thursday November 12, 2015
Plummer Room - Civic Centre
from 3:00 p.m. to 7:00 p.m.

Consultants and municipal staff will be available to discuss the drainage issues in the two study areas, and get input from interested parties on the preferred solutions.

The public is invited on a come and go basis between 3 p.m. and 7 p.m. to visit and provide input or have questions answered.

Subject to comments received as a result of this notice, the City plans to proceed with the completion of Class EA's for these projects and Environmental Study Reports will be prepared and placed on the public record for a minimum of 30 days.

PTO

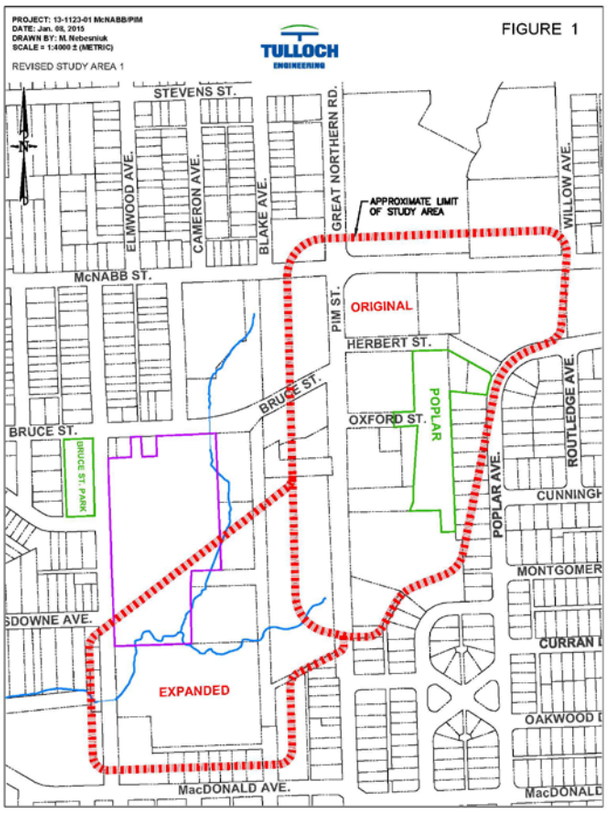
For more information, please contact:

Pat McAuley P. Eng.
Tulloch Engineering
71 Black Rd Unit 8
Sault Ste. Marie ON.
P6B 0A3
Phone (705) 949 1457
pat.mcauley@tulloch.ca

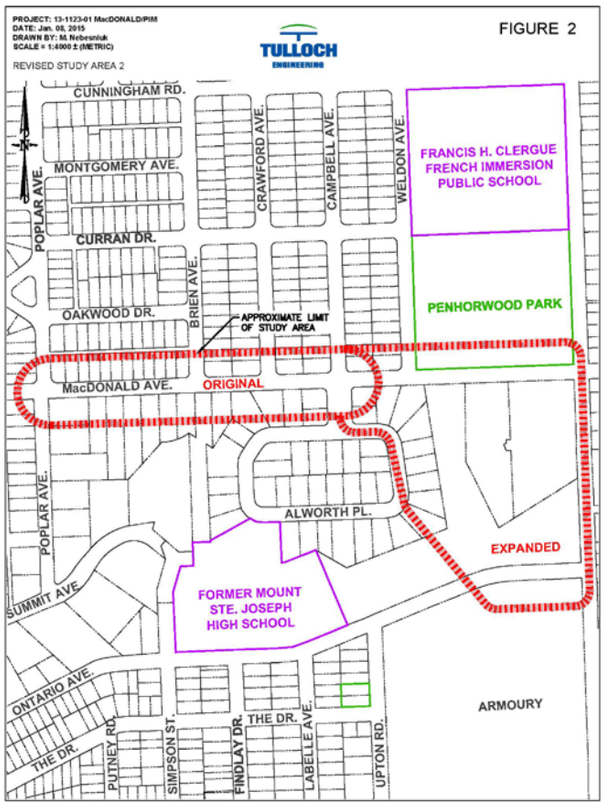
Don Elliott, P. Eng.
City of Sault Ste. Marie
99 Foster Drive
Sault Ste. Marie, ON
P6A 5X6
Phone (705) 759-5329
d.elliott@cityssm.on.ca

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.

Study Area #1



Study Area #2



McNabb St and MacDonald Ave Environmental Assessment Studies

Public Consultation Centre #2

Thursday November 12, 2015

Plummer Room Civic Centre 3:00 p.m. to 7:00 p.m.

Please Sign In:

NAME	ADDRESS	PHONE	EMAIL ADDRESS
Ryan Scott	235 McNabb		
Carmen Marrelli	410 Pim St		
Andrea Quarrelli	410 Pim St		
Joan Kelly	3 Gladstone		
STEVE TAYLOR	74 FAIRMONT DR		
JUSTIN CAMPBELL	105 ALGARTH A		
JOAN & TODY CURRAN	11 Summit AVE		
Nancy Evans ; Ryan Nadeau	205 McNabb (AFS)	105	
Steve McGuire	313 MacDonald		
Patrick McGuire	313 MacDonald Ave.		
TINA GACCIONE	219 MACDONALD AVE		
JEFF RANTAMAKI	219 MACDONALD AVE.		
MARIO FEBBRARO	29 Algonquin		

Please Sign In:

NAME	ADDRESS	PHONE	EMAIL ADDRESS
SAM NICOLETTA	25 ALWORTH PL		
PEGGY WRIGHT	159 POPLAR		
MARK WRIGHT	159 POPLAR AVE		
GORD DION	3 WELDON AVE		
DAVE MURPHY	9 ALWORTH PLACE		
Anne Lee	33 Alworth		

McNabb/Pim St Storm Water Drainage

Class Environmental Assessment

INFORMATION BULLETIN

November 2015

Introduction

Street flooding on McNabb St has occurred fairly regularly between Great Northern Rd and Willow Avenue, as a result of the storm sewer system backing up during heavy rain falls. As a result buildings on the south side have experienced basement and surface flooding, in driveways and in parking lots. Further south, the Canadian Motor Hotel has also experienced flooding, both in the building itself and in the parking lot area. A class environmental assessment is being undertaken by The City's Engineering and Planning Department to look for ways to reduce the frequency of flooding in the area. This is the second public open house being held in order to present the preferred option and to consult with the public and to request feedback.

Background

In 2011 City Council requested the Engineering Department review the storm drainage system and to recommend a solution to address the issue. In 2012 a Storm Sewer Capacity Analysis and Condition Assessment was completed by Tulloch Engineering for the storm drainage area. The report concluded the storm sewer is inadequate to convey flows from a 2-year storm without the presence of surface flooding on McNabb St. The City's current design standard is for storm sewers to have capacity to carry 10 year storm events. The sewer system is therefore undersized, and in addition, has structural deficiencies in need of repair.

Class Environmental Assessment

Infrastructure projects undertaken by municipalities must follow a Class Environmental Assessment process, which is a streamlined approach used for routine and predictable projects to fulfill the requirements of the Environmental Assessment Act. The Class EA process was developed to ensure that environmental concerns are addressed and public consultation is sought.

Alternative Solutions

The first public open house was held in January 2014 to present the problem/opportunity along with alternative solutions and to seek input. Alternative solutions included complete sewer replacement of all undersized sewers all the way to the St Mary's River, underground storage, above ground storage in neighbourhood parks, and provision of relief sewers to increase pipe capacity as far as the natural ravine west of Pim St.

Based on public input during the first open house, the study area limits were expanded to include temporary storage of water in the natural ravine west of Pim St, over to Gladstone Ave. (the ravine located south of Great Lakes Honda). Storage would be needed by means of a control structure to prevent flooding downstream from Gladstone Ave.

This open house is now being held to consult with interested parties and to present the preferred solution along with various design concepts.

Preliminary Preferred Solution

After evaluating the alternatives the preferred solution is to replace undersized pipes from McNabb St, south through Poplar Park and the Canadian Motor Hotel parking lot to the outlet into the ravine, and turn the ravine into a storage facility/stormwater management pond that would temporarily hold excess water during storm events. The solution is divided into a preferred conveyance solution (in ground piping improvements), and a preferred storage solution.

PTO

A) Preliminary Preferred Conveyance Solution

Two new storm sewer installations were considered; one involves the construction of a relief sewer of suitable diameter in the easement alongside the existing system, and the second consists of a complete replacement of the existing with a larger diameter pipe in the easement.

It is noted that both of these conveyance improvements should be done in conjunction with necessary pipe replacement of the Monterey Gardens Subdivision storm outlet running through the Canadian Motor Hotel's parking lot, from Poplar Ave.

The preliminary preferred solution is to replace the existing pipe network with a new storm sewer.

B) Preliminary Preferred Temporary Storage Solution

Two alternative ravine storm water management designs were considered. The first one involves construction of an outlet control structure in the ravine east of Gladstone Ave that allows normal volumes to pass and drain westerly, but retains above normal flows up to the City's 10 year design storm frequency, then releasing the excess over a period of time, once the storm event/snow melt has subsided. The second one includes building an outlet control structure that allows normal volumes to pass but retains above normal flows up to the City's 100 year design storm frequency. The ravine would receive water during a 100 year event from both piped flow and overland flow from Pim St/Bruce St and areas north. The preliminary preferred solution is to construct the outlet control structure to accommodate the City's 100 year design storm providing increased protection to the downtown area. Maximum water depths in the ravine would be 3.5 - 4m adjacent to Gladstone Ave. The expected drawdown time would be 8-12 hours following the end of the storm event. The 100 yr event ponding extents within the ravine and would extend from the outlet control structure at Gladstone Ave easterly to approximately Pim St.

Your Involvement

Please review the documentation and ask questions of City staff and the consultant. Questions and comments can be also submitted on the form provided until **November 30, 2015.**

Next Steps

After all comments have been received the consultant will compile all information and then finalize the preferred solution. An environmental study report (ESR) will be produced documenting the process and a Notice of Completion will be advertised and issue to all those on the mailing list, including those in the study area and agencies. The public will have the opportunity to review the final project documentation over a period of 30 days.

If no significant concerns or objections to the undertaking are received during the 30 day review period the City may proceed with final design of the project and construction subject to receiving all technical approvals and the required capital budget funding.

If a concern cannot be resolved through discussions with City officials and the consultant a request can be brought to the Minister of the Environment to make an order for the project to comply with Part II of the Environmental Assessment Act. A Part II Order addresses individual environmental assessments. Requests for a Part II Order must clearly identify the rational for the objection and ultimately the Minister will decide based on the process and the rationale for the decisions reached.

Thank you for your interest.

For more information, please contact:

Pat McAuley P. Eng.
Tulloch Engineering
71 Black Rd Unit 8
Sault Ste Marie ON.
P6B 0A3
Phone (705) 949 1457
pat.mcauley@tulloch.ca

Don Elliott, P. Eng.
City of Sault Ste. Marie
99 Foster Drive
Sault Ste. Marie, ON
P6A 5X6
Phone (705) 759-5329
d.elliott@cityssm.on.ca

TULLOCH ENGINEERING

Structural Civil & Municipal Contract Administration Environmental Geotechnical Mechanical & Electrical Inspection & Testing

Public Information/Consultation Centre #2

McNabb St and MacDonald Ave Environmental Assessments

November 12, 2015, 3:00 p.m. to 7:00 p.m.

Plummer Room - Civic Centre

Representatives in attendance:

City of Sault Ste Marie representatives: Carl Rumiel, 3:00 p.m. to 6:30 p.m.

Tulloch Engineering representatives: Pat McAuley, 2:30 p.m. to 7:00 p.m.

John McDonald, 2:30 p.m. to 7:00 p.m.

Public participation:

Public attendance: 21 people signed in on sign in sheet (attached)

4-5 people declined to sign in despite encouragement, but reviewed info/took handouts

Information material on walls and tables:

-Drawing of both study areas, showing original and expanded areas

-Various photos, including November 17th 2013 flooding in both areas, ravine photos, etc

-1958 compiled drawing of topographic information, showing ravine system before filling

-Copies of "Storm Sewer Capacity Analysis and Condition Assessment" reports for both study areas, completed in 2012, including all drawings

-Environmental Study Reports by Tulloch Environmental for both areas, dated December 1st, 2014.

-Copy of Stage 1 & 2 Archaeological Assessment by Horizon Archaeological Inc, for both areas

-Municipal Class E.A document for reference

-List of Alternatives with concepts/expected results

-Evaluation Criteria

71 Black Road, Unit 3
Sault Ste. Marie, ON
P6B 0A3
www.tulloch.ca

Phone: (705) 949.1457
Fax: (705) 945.5092
saultstemarie@tulloch.ca

-Evaluation Results Chart

-Preferred Conveyance and Storage Alternative Drawings, overlaid on "Google satellite image" for both areas

-Plan and Profile drawing for MacDonald Ave, showing proposed sewer work on the road, from Alworth Street easterly

-Information Bulletins for both projects as handouts, giving a summary of the EA process

-Sign in sheets, comment sheets

Summary:

Discussion took place with most visitors in a "one on one" format reviewing the flooding problems and discussing the referred alternatives, and their perspectives with regard impact on their homes or businesses. The wall mounted photos and the satellite images with the preferred alternatives were very useful in the discussions. The other alternatives that were reviewed and the reasons why they were not pursued were discussed. Everyone was asked to take a comment/question sheet and either fill it out that night, or to take it with them and return it (mail or emailed comments) to either Don Elliott or Pat McAuley.

Questions and area of interests were split between the two study areas.

Various comments/ issues that were raised:

- The YMCA has done considerable work flood proofing their building after several major basement flooding events. They drain various amounts of water daily from the pool into the storm sewer system behind the building, but have now put a valve on the outlet pipe.

- Discussion took place with the owner of The Canadian Motor Hotel once again (separate meeting was held with him on Oct 15th at the Civic Centre) He discussed his flooding damage from past floods and offered to sell his building for storm water storage. He asked about staging of the work on his property and ways to minimize the impact on his business.

- The owners of 159 Poplar Ave came to discuss foundation cracking/settling of their house adjacent to a former ravine. They had called on November 5 to discuss the notice received in the mail, and were encouraged to attend the open house to see the 1958 topo map showing the original ravines. Discussion centered on the possibility that part of the house's foundation may be on fill which was slowly settling. They had obtained a rough estimate to underpin the

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Sault Ste. Marie, ON
P6B 0A3
www.tulloch.ca

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house about 10 years ago. The need to replace the sewer south of thehouse was also discussed. In order to avoid any further settlement shoring or a trench box might be used, or the sewer may be relocated further south. An insurance inspection would be done before and after.

- The primary concern raised with the MacDonald Ave preferred solution was what effects the increased water would have on the ravine, including erosion potential, and loss of vegetation in the ravine

PMc

16/11/2015

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TULLOCH
ENGINEERING

71 Black Road
Unit 8
Sault Ste. Marie, ON
P6B 0A3

T. 705 949.1457
F. 705 949.9606
TF. 866 806.6602
saultstemarie@TULLOCH.ca
WWW.TULLOCH.ca

McNabb Street & MacDonald Avenue Environmental Assessments
Public Open House #2
Thursday November 12, 2015
Plummer Room Civic Centre

Thank you for attending today's open house concerning the flooding issues in the McNabb St and the MacDonald Ave areas.

Your comments or questions are appreciated and will be incorporated into the project file and final recommendations to the City of Sault Ste Marie. All questions will be responded to if contact information is provided (address and/or email).

Primary Area of Interest: McNabb St Study Area [✓]
MacDonald Ave Study Area [ ]

Comments/Questions?

Please forward contact information for the individual from MET to [illegible] and [illegible] .org

- Seems like an excellent solution for both areas.
-also seems very similar to how the City of Toronto currently controls flooding. -great info to use for future management on our end. -Regent Property

Contact Information (optional)

Name: _____

Address: _____

Email: _____

For more information, please contact:

Pat McAuley P. Eng.
Tulloch Engineering
71 Black Rd Unit 8
Sault Ste Marie ON.
P6B 0A3
Phone (705) 949 1457
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City of Sault Ste. Marie
99 Foster Drive
Sault Ste. Marie, ON
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Phone (705) 759-5329
d.elliott@cityssm.on.ca

To fulfill the requirements of the Environmental Assessment Act, we will keep all comments on file for use during the study, and include them in the project file. With the exception of personal information, all comments received will become part of the public record. Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act.*

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Primary Area of Interest: McNabb St Study Area [ ]
MacDonald Ave Study Area [ ]

Comments/Questions?

I believe you have answered most questions we have at this point.

Contact Information (optional)

Name: Carmen Marreeei

Address: 410 Pim St

Email: _____

For more information, please contact:

Pat McAuley P. Eng.
Tulloch Engineering
71 Black Rd Unit 8
Sault Ste Marie ON.
P6B 0A3
Phone (705) 949 1457
pat.mcauley@tulloch.ca

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APPENDIX 7

Preliminary Cost Estimates for Preferred Designs

Preferred Conveyance and Storage Alternative
McNabb Street Area Flooding

Preliminary Cost Estimate

Part A	**Gladstone Avenue to Pim Street**	
Item No.	**Description**	**Estimated Price**
1	Twin 900mm ϕ Conc. Culvert Crossing Gladstone	$62,000
2	2 STC 4000 Sediment Control Structures	$150,000
3	Dam/Outlet Control Structure	$255,000
4	Scour protection from Gladstone Ave. to Pim St	$61,100
5	Gladstone Ave. Restoration	$131,600
	Sub Total Part A	**$659,700**
Part B	**Storm Sewer Outlet at west side of Pim Street to McNabb Street**	
6	Storm sewer outlet/headwall to ravine	$49,500
7	Traffic control , signage, detours, temporary business access, etc. Allowance	$50,000
8	Sheet pile trench stabilization at the Canadian Hotel for storm sewer installation	$540,000
9	1500 mmϕ Concrete storm Sewer	$1,118,250
10	2400 mmϕ Maintenance Holes	$180,000
11	Pim Street Restoration	$280,000
12	Algoma Family Services Parking Lot Restoration	$123,000
13	McNabb Street Restoration	$30,000
14	Poplar Park Restoration (Topsoil and Hydroseed)	$30,000
	Sub Total Part B	**$2,400,750**
Part C	**450 mmϕ Storm Sewer from Poplar Avenue to the 1500 mmϕ Storm Sewer**	
15	450 mmϕ Storm Sewer	$54,100
16	Maintenance Holes	$12,300
17	Poplar Avenue Restoration	$28,000
18	Canadian Hotel Restoration (includes for 1500 mmϕ and 450 mmϕ Storm Sewer installation	$394,000
	Sub Total Part C	**$488,400**

Part D	**Contingencies**	
19	Contingencies - Replace potentially poor soil with engineered fill and allowance for easement purchase	$1,000,000
	Sub Total Part D	$1,000,000
	Summary	
	Part A	$659,700
	Part B	$2,400,750
	Part C	$488,400
	Total Estimated Construction Cost	**$3,548,850**
	Part D	$1,000,000
	Total Estimated Construction Cost Plus Contingency	**$4,548,850**
	PUC/Bell/Union Gas Allowance	$75,000
	Engineering (Geotechnical/Design/Contract Administration)	$532,328
	Total Estimated Project Cost	**$5,156,178**

FIGURE 1

Sketch of Initial Study Area

PROJECT: 13-1123-01 McNABB/PIM
DATE: Dec. 16, 2013
DRAWN BY: M. Nebesniuk
SCALE = 1:4000 ± (METRIC)

PROJECT LIMITS

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FIGURE 1

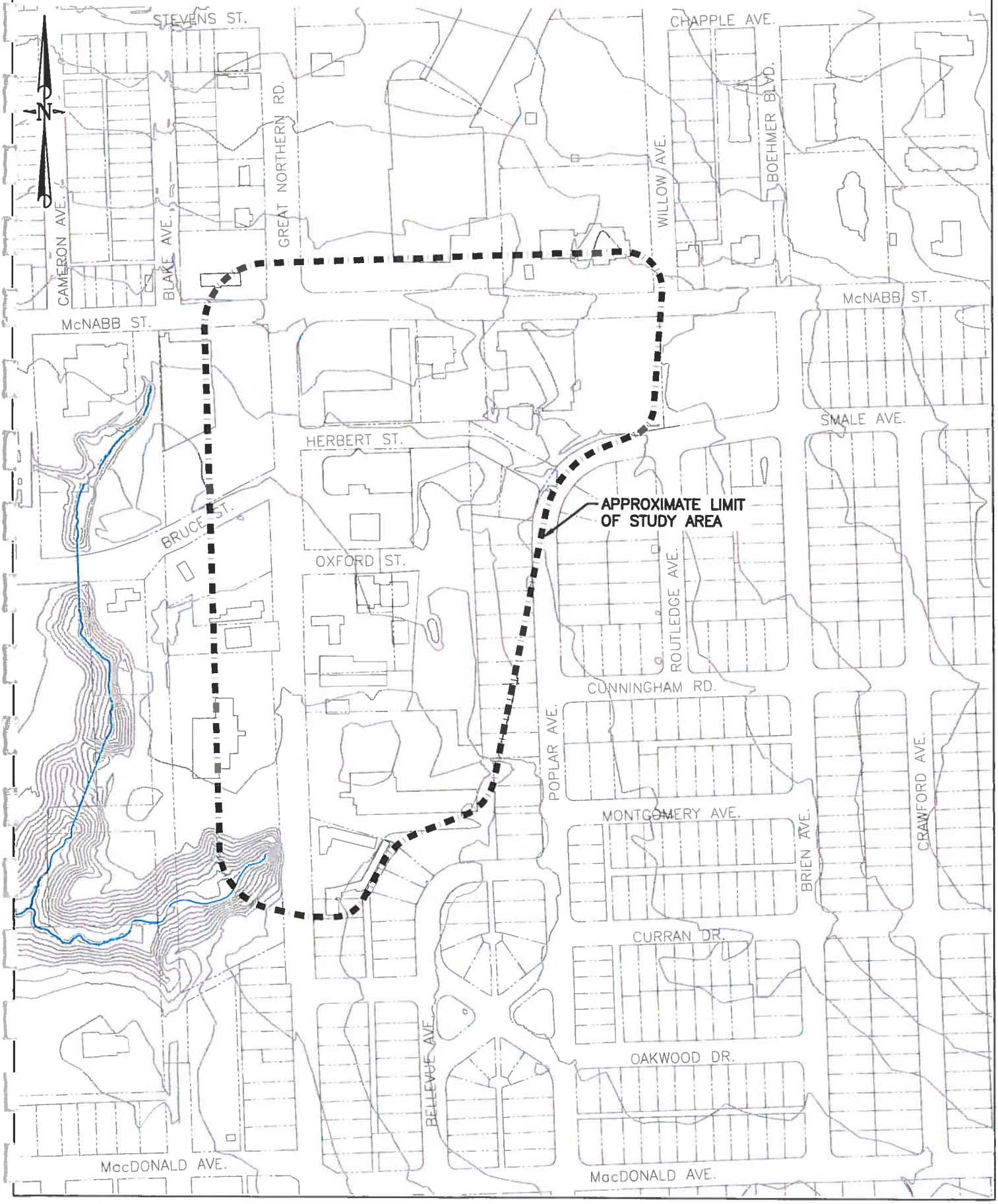

FIGURE 2

Sketch of Expanded Study Area

PROJECT: 13-1123-01 McNABB/PIM
DATE: Jan. 08, 2015
DRAWN BY: M. Nebesniuk
SCALE = 1:4000 ± (METRIC)

REVISED STUDY AREA 1

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FIGURE 2

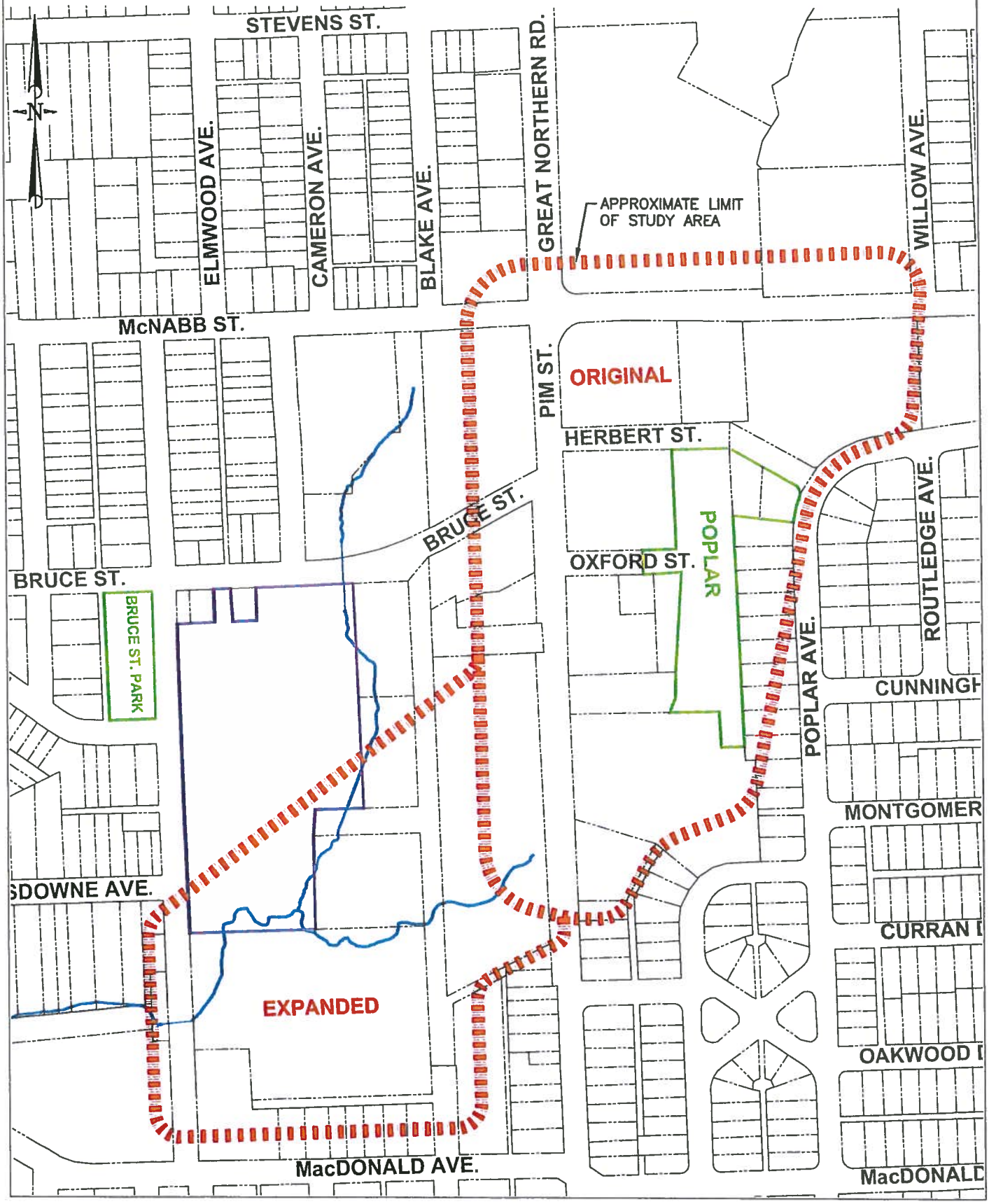
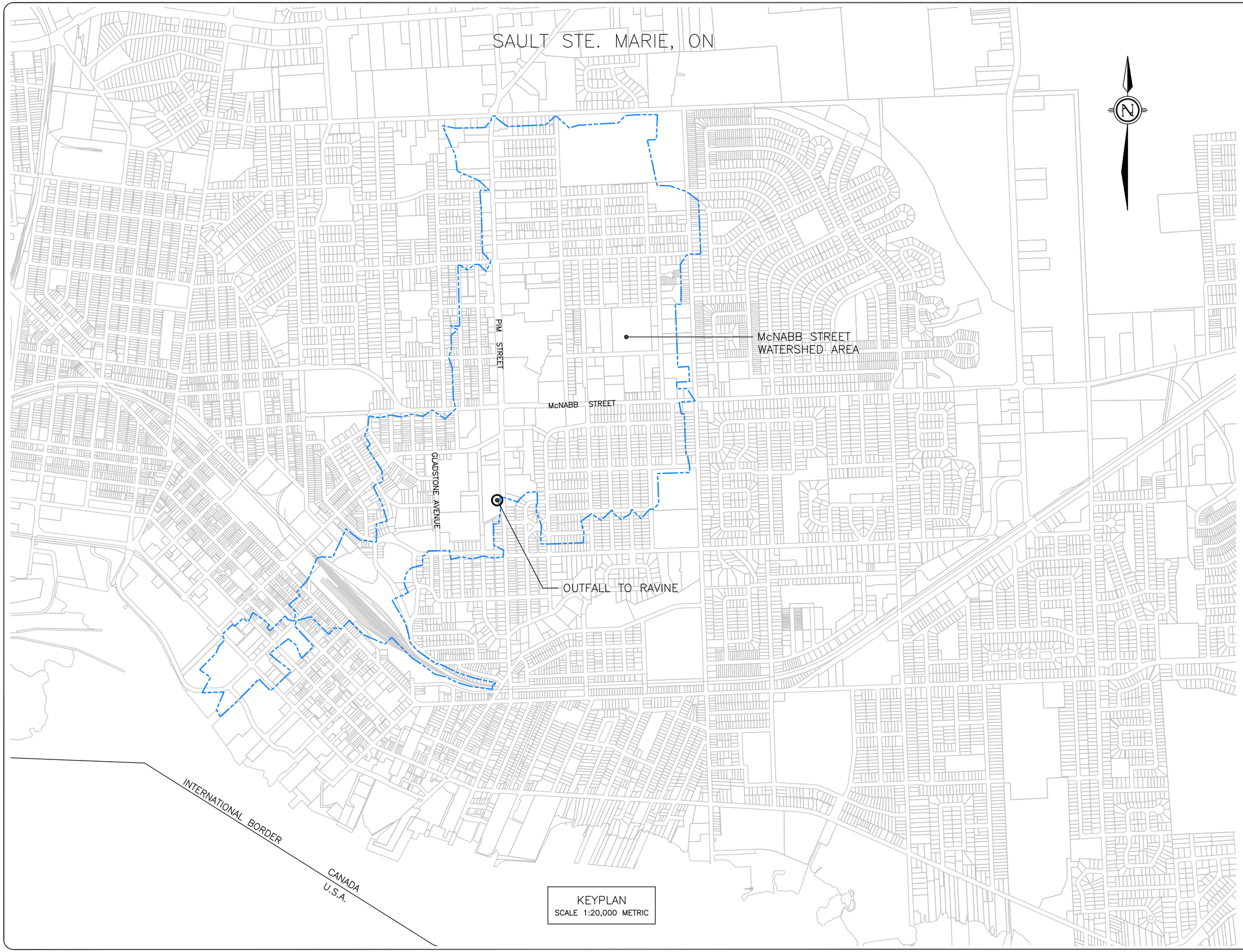


FIGURE 3

Drainage Area



KEYPLAN
SCALE 1:20,000 METRIC

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REVISIONS

No	DATE	REMARKS
0	16.01.04	ISSUED FOR REPORT

LEGEND

- INDEX CONTOUR (1.0m INTERVAL)
- PROPERTY LINE
- BUILDING OUTLINE
- EXISTING STORM
- EXISTING STORM UNDER REVIEW
- MAINTENANCE HOLE • 10
- STORM STUDY LIMITS McNABB ST. NETWORK

PROJECT TITLE
McNABB STREET FLOODING E.A.

DRAWING TITLE
WATERSHED AREA McNABB STREET STORM NETWORK

LOCATION
SAULT STE. MARIE, ONTARIO

DATE	JANUARY 2016
DRAWN	KTN
CHECKED	JVM
SCALE	AS SHOWN
ISSUED FOR TENDER	——
ISSUED FOR CONSTRUCTION	——

DWG. No.	PROJECT No.	REV. No.
3	13–1123	0

FIGURE 4

Storm Sewer Plan and Profile

FIGURE 4a

FIGURE 4b

FIGURE 4c

FIGURE 4d

LIMIT OF STUDY

WATERSHED AREA
McNABB STREET NETWORK
(CONTRIBUTING AREA=130.2 ha ±)

TULLOCH
ENGINEERING

REVISIONS

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0	16.01.04	ISSUED FOR REPORT

LEGEND

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- EXISTING STORM UNDER REVIEW
- MAINTENANCE HOLE # (• 10)
- STORM STUDY LIMITS McNABB ST. NETWORK

PROJECT TITLE
McNABB STREET FLOODING E.A.

DRAWING TITLE
McNABB STREET STORM NETWORK

LOCATION
SAULT STE. MARIE, ONTARIO

DATE JANUARY 2016
DRAWN KTN
CHECKED JVM
SCALE 1:6000
ISSUED FOR TENDER ——
ISSUED FOR CONSTRUCTION ——

DWG. No. 4a | PROJECT No. 13-1123 | REV. No. 0

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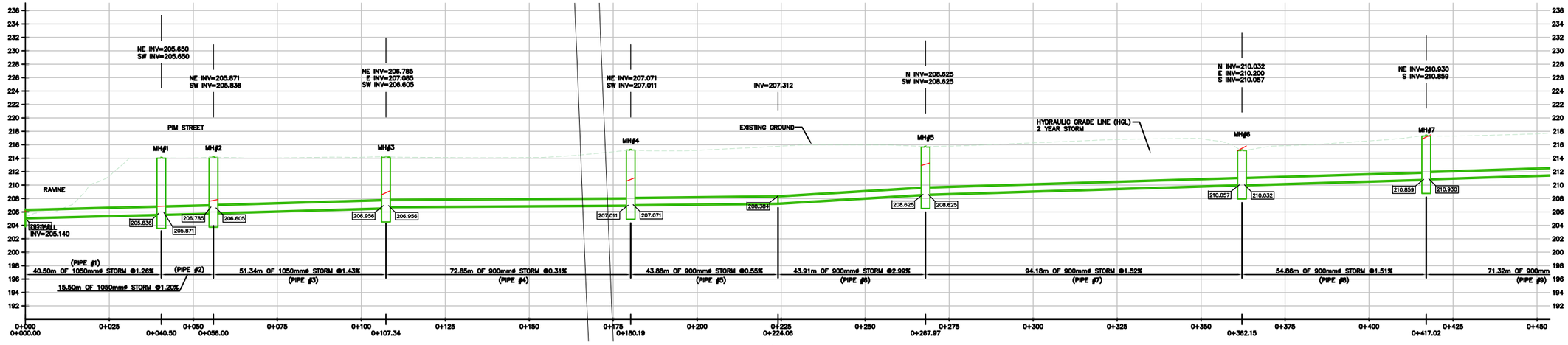

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1:600 VER.

Horizontal & Vertical Datum:
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TULLOCH ENGINEERING

REVISIONS

No	DATE	REMARKS
0	16.01.04	ISSUED FOR REPORT

LEGEND:

- INDEX CONTOUR (1.0m INTERVAL) — 210
- PROPERTY LINE
- BUILDING OUTLINE
- EXISTING STORM
- EXISTING STORM UNDER REVIEW
- CIVIC No. 195
- MAINTENANCE HOLE — MH
- HYDRAULIC GRADE LINE (HGL) 2 YR. STORM
- EXISTING GROUND
- WATERSHED BOUNDARY

GENERAL NOTES:

(PIPE #) REFERS TO THE NUMBER ASSOCIATED IN THE AUTOCAD HYDRAFLOW MODELING REPORTS.

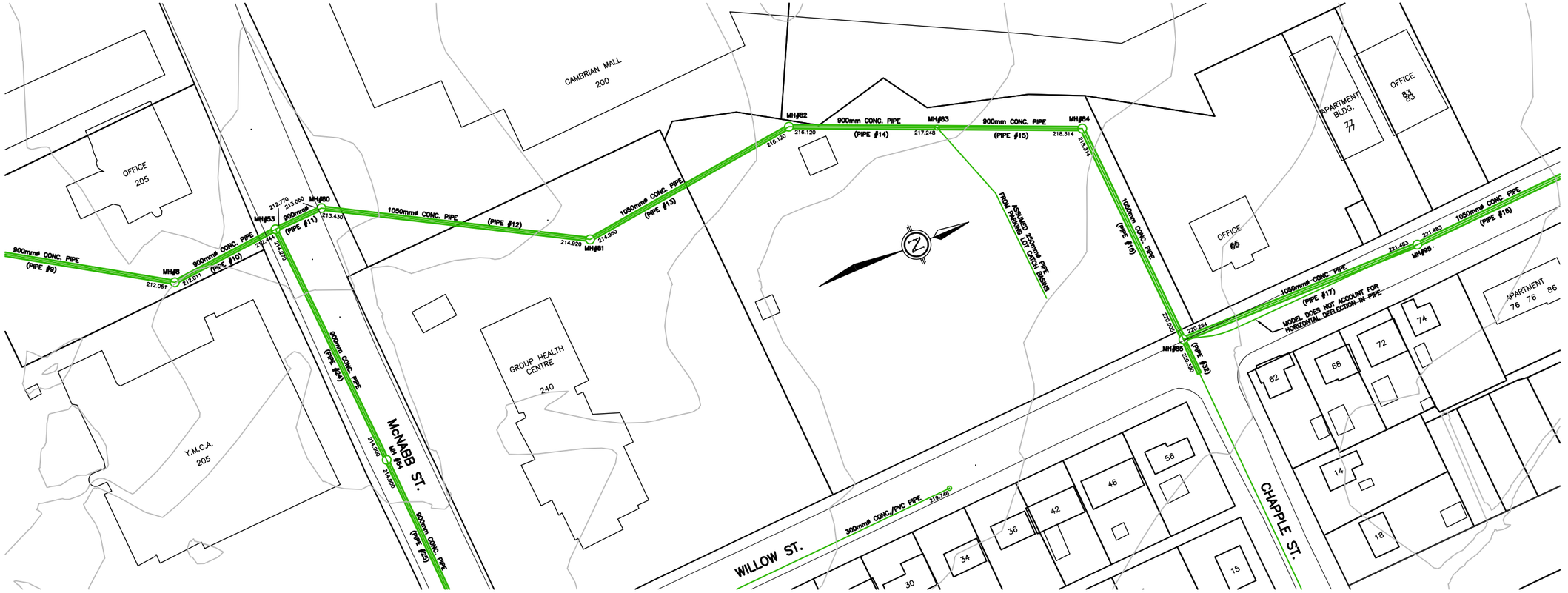
PROJECT TITLE
McNABB STREET FLOODING E.A.

DRAWING TITLE
STORM SEWER PLAN & PROFILE

LOCATION
SAULT STE. MARIE, ONTARIO

DATE	JANUARY 2016
DRAWN	KTN
CHECKED	JVM
SCALE	1:1200 HOR. 1:600 VER.
ISSUED FOR TENDER	
ISSUED FOR CONSTRUCTION	

DWG. No.	PROJECT No.	REV. No.
4b	13-1123	0



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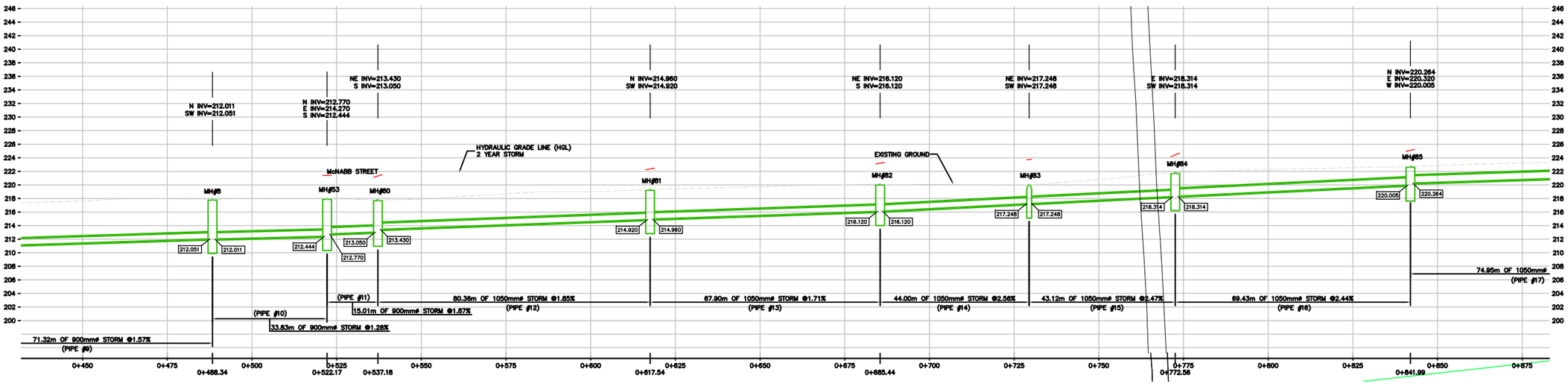

PROFILE
SCALE 1:1200 HOR.
1:600 VER.

Horizontal & Vertical Datum:
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TULLOCH ENGINEERING

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- EXISTING GROUND

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McNABB STREET FLOODING E.A.

DRAWING TITLE
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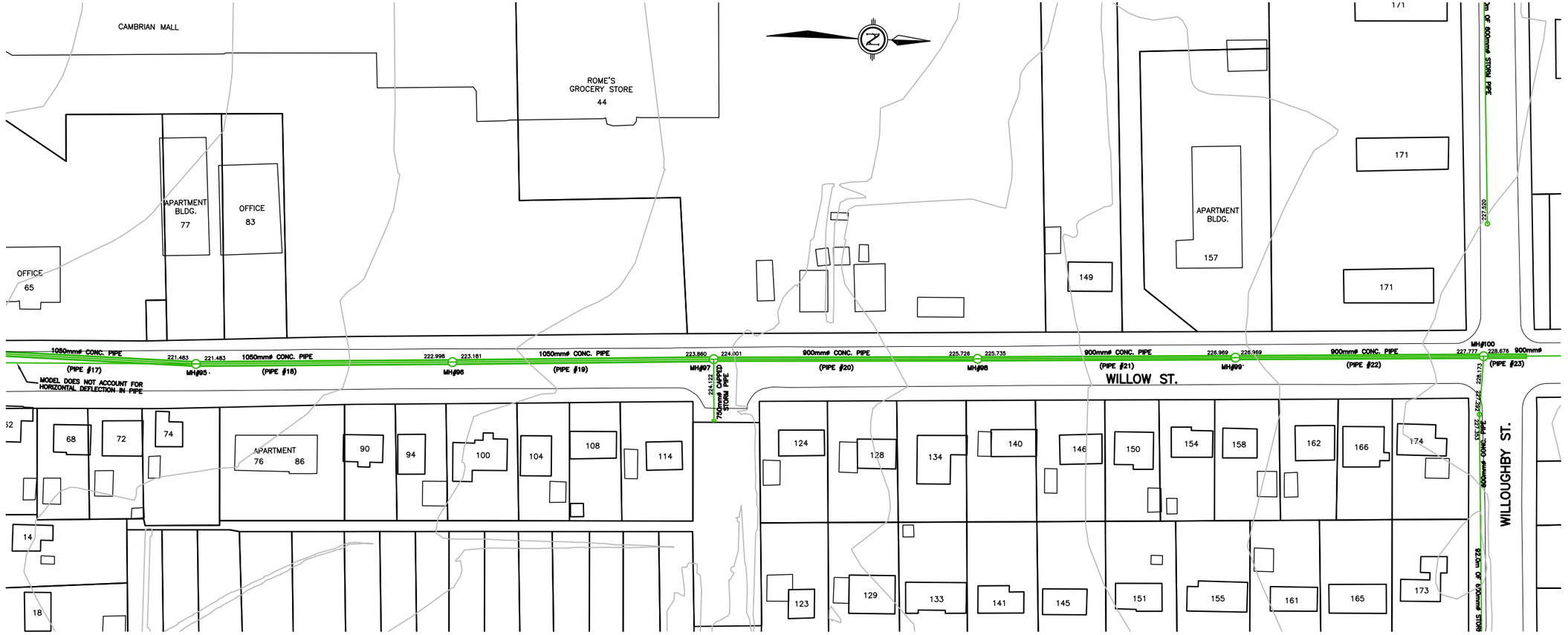
LOCATION
SAULT STE. MARIE, ONTARIO

DATE	JANUARY 2016
DRAWN	KTN
CHECKED	JVM
SCALE	1:1200 HOR. 1:600 VER.
ISSUED FOR TENDER	——
ISSUED FOR CONSTRUCTION	——

DWG. No.	PROJECT No.	REV. No.
4c	13-1123	0



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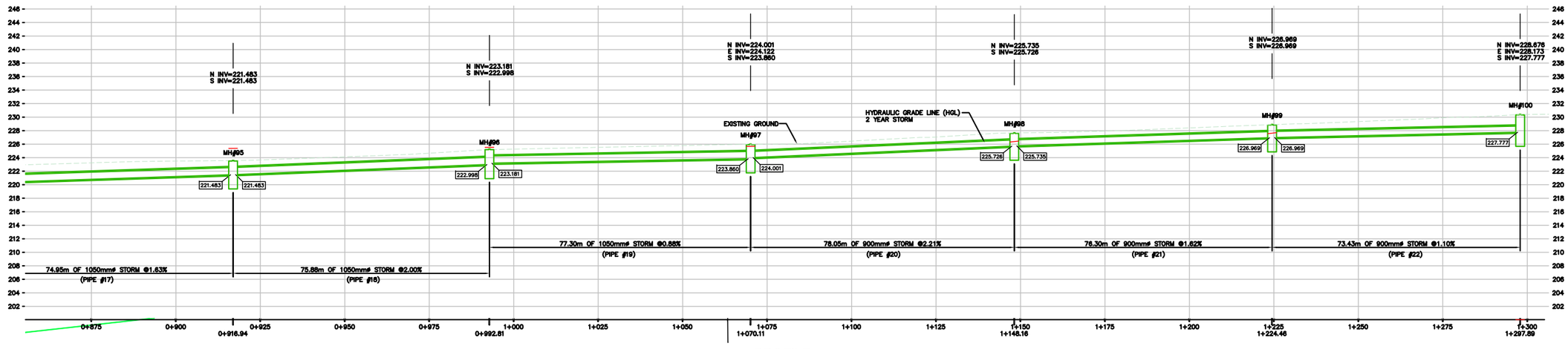

PROFILE
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1:600 VER.

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DRAWING TITLE
STORM SEWER PLAN & PROFILE

LOCATION
SAULT STE. MARIE, ONTARIO

DATE	JANUARY 2016
DRAWN	KTN
CHECKED	JVM
SCALE	1:1200 HOR. 1:600 VER.
ISSUED FOR TENDER	——
ISSUED FOR CONSTRUCTION	——

DWG. No.	PROJECT No.	REV. No.
4d	13-1123	0

PLAN
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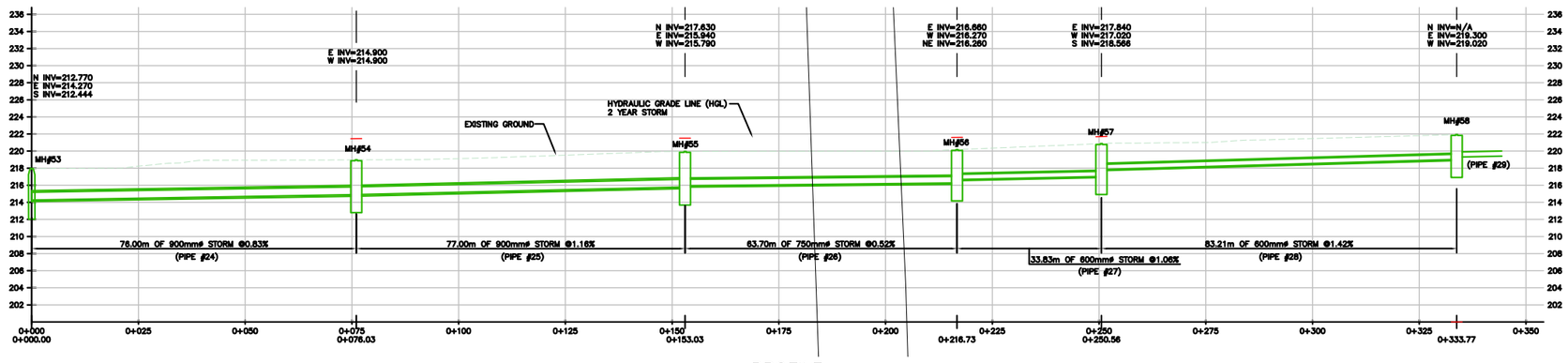

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1:300 VER.

Horizontal & Vertical Datum:
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LOCATION
SAULT STE. MARIE, ONTARIO

DATE	JANUARY 2016
DRAWN	KTN
CHECKED	JVM
SCALE	1:1200 HOR. 1:600 VER.
ISSUED FOR TENDER	——
ISSUED FOR CONSTRUCTION	——

DWG. No.	PROJECT No.	REV. No.
4e	13–1123	0

FIGURE 5

Plan of Preferred Design Concept

of Conveyance and Temporary Storage

PREFERRED CONVEYANCE & STORAGE ALTERNATIVE
McNABB STREET AREA FLOODING

NORTH

LEGEND:

PROPOSED STM. SEWER

EXISTING STM. SEWER

DATE	REV No.	REVISION	BY	APPD
15.11.12	0	ISSUED FOR MEETING	KN	PM

ENGINEER'S SEAL:

CLIENT:

CITY OF SAULT STE. MARIE

CONSULTANT:

TULLOCH ENGINEERING

PROJECT: STORM WATER MANAGEMENT

DRAWING TITLE:

PREFERRED CONVEYANCE & STORAGE ALTERNATIVE

McNabb St. Area Flooding

SCALE: N.T.S.

DATE: NOV. 12, 2015

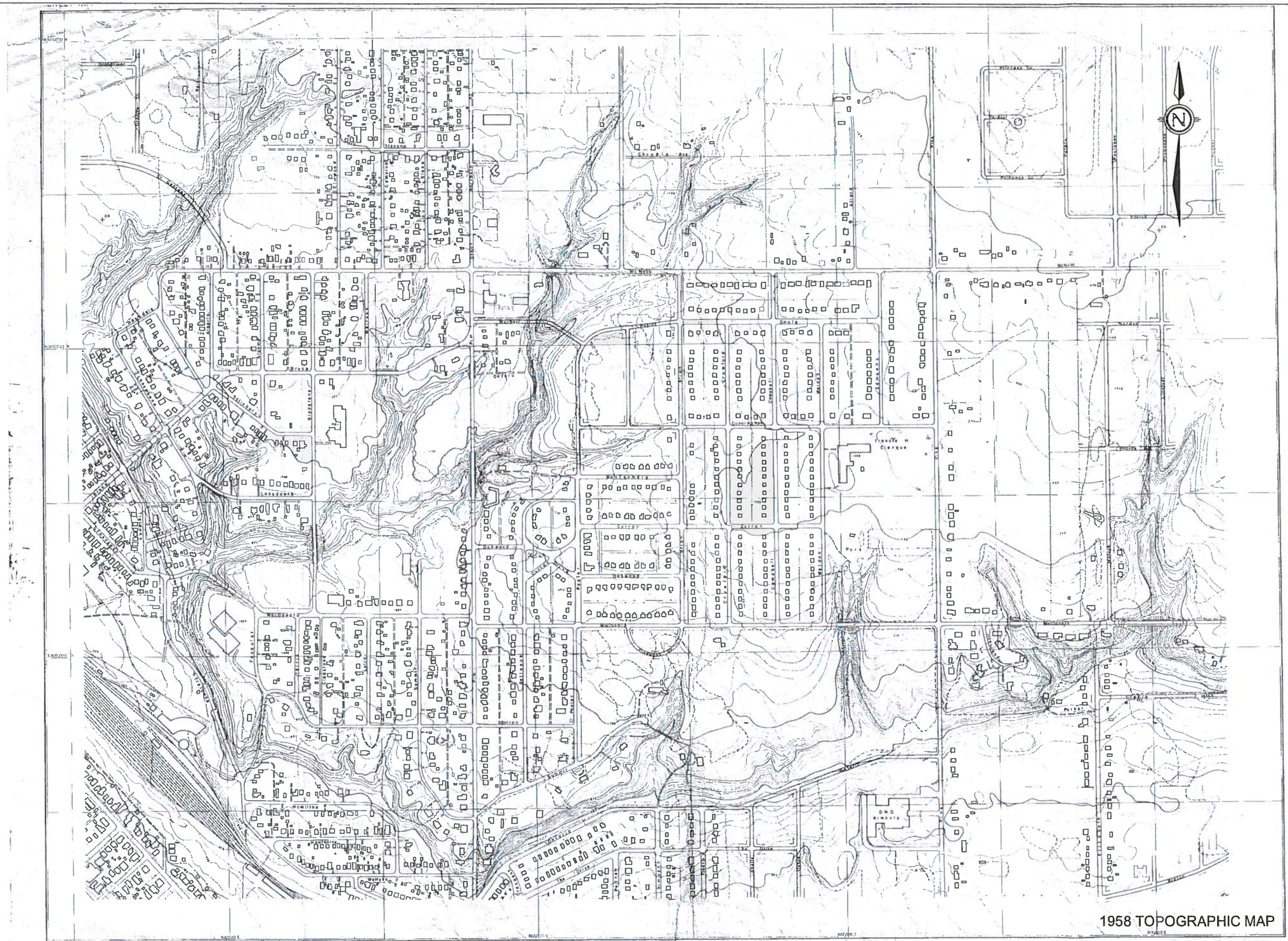
DRAWN	CHECKED	DRAWING	REV
KN	PM	P2	0

PROJECT No: 13-1123

CAD DRAWING: 13-1123 MacDonald and McNabb Ponds.dwg

FIGURE 6

1958 Topographic Map of Study Area



TULLOCH ENGINEERING

REVISIONS

No	DATE	REMARKS
0	16.01.04	ISSUED FOR REPORT

LEGEND

PROJECT TITLE
McNABB STREET FLOODING E.A.

DRAWING TITLE
TOPOGRAPHIC MAP YEAR 1958

LOCATION
SAULT STE. MARIE, ONTARIO

DATE	JANUARY 2016
DRAWN	KTN
CHECKED	JVM
SCALE	N.T.S.
ISSUED FOR TENDER	——
ISSUED FOR CONSTRUCTION	——

DWG. No.	PROJECT No.	REV. No.
6	13-1123	0