

Rural Municipality of  
**Alexander**  
Municipalité Rurale de

RURAL MUNICIPALITY OF ALEXANDER

**TRAVERSE BAY BOAT LAUNCH  
MANITOBA ENVIRONMENT ACT PROPOSAL**

FINAL

KGS Group 17-1274-003  
June 2018


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File No. 17-1274-003

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ATTENTION: Ms. Tracey Braun  
Director

RE: Environment Act Proposal  
Rural Municipality of Alexander – Traverse Bay Boat Launch

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Dear Ms. Braun:

On behalf of the Rural Municipality of Alexander, KGS Group is pleased to submit four (4) paper copies and one (1) electronic copy of the final Environment Act Proposal to obtain a licence for the proposed Traverse Bay Boat Launch. The proposed boat launch is required because the RM of Alexander no longer has access to the boat launch that was previously being used when it was transferred from federal to private operation. Based on discussions with Manitoba Sustainable Development, Environmental Approvals Branch the project is considered a Class 2 development under Manitoba Regulation 164/88 requiring completion of this environmental assessment for licencing under *The Environment Act* (Manitoba).

As part of the licensing process, an Environment Act Proposal Form with the \$7,500.00 application fee has been included with the Environmental Assessment report.

Please do not hesitate to contact the undersigned if you have any questions or require additional information.

Yours truly,

Shaun Moffatt, M.Sc.  
Senior Environmental Scientist

SM/jr  
Enclosure

cc: Scott Spicer, Rural Municipality of Alexander

## EXECUTIVE SUMMARY

Kontzamanis Graumann Smith MacMillan Inc. (KGS Group) was retained by the Rural Municipality (RM) of Alexander to prepare an Environment Act Proposal (EAP) for a boat launch into Lake Winnipeg. The proposed boat launch is required because the RM of Alexander no longer has access to the First Nation boat launch that was previously being used. Based on discussions with Manitoba Sustainable Development, Environmental Approvals Branch the project is considered a Class 2 development under Manitoba Regulation 164/88 requiring completion of this environmental assessment for licencing under *The Environment Act* (Manitoba). Project and environment interactions were assessed to identify potential environmental effects associated with the boat launch project.

The boat launch facility will consist of a 5 m wide access ramp (from the access road) with 1 m wide ditches on each side, a 10 m by 45 m staging and turn-around area, a 3 m wide boat launch ramp, a launching dock and two rockfill groynes (80 m and 145 m long) to provide protection from wind and wave action. While not proposed to be installed during initial construction, the facility design provides space to accommodate the installation of several pipe pile floating docks in the future. Assessment, design, and construction of an access road from Traverse Bay Road North to the proposed boat launch site and a parking area to accommodate up to 15 vehicles with trailers was completed in-house by the RM of Alexander.

Trees will be felled and the bank excavated to a stable slope for the access ramp and staging area with the material hauled off site for re-use or disposal. The in-situ soil base will be compacted and a geotextile placed followed by a 300-mm layer of gravel road surface. The reshaped slopes will be revegetated with appropriate native grasses and potentially tree planting to provide additional stability.

The boat launch will be designed for small and medium class motorboats and non-motorized boats. The in-water construction for the boat launch will be completed in the winter and entail dredging for the rock groynes, concrete launch pad, and future docks, as well as, potential shoreline protection (rip rap). Dredging will be completed using a backhoe with the material hauled off site for re-use or disposal. Rockfill riprap for the groynes will be placed starting at the shore and working out to provide a working platform.

Anticipated maintenance items outlined in the feasibility studies included seasonal repairs to the launch ramp or rock groyne structures (and docks in the future); marking hazard rocks; re-grading of the gravel parking lot and access road and ramp; dredging of the lake bed between the rock groynes to maintain the minimum channel depth; and general refuse cleanup.

Inquiries with various government bodies have indicated that there are no major environmental constraints such as rare species on the site. Species of conservation concern in the broader region that may use the project area include one fish (bigmouth buffalo) and several bird species (Canada warbler, eastern wood-pewee, olive-sided flycatcher and whip-poor-will), however no evidence of their presence was recorded or encountered at the project site.

Substrate conditions were consistent throughout the project area and were comprised of a band (~ 50 m) of larger substrate materials (gravels, cobble, and boulders) in shallow water along the shoreline and a narrow band (~ 25 m) of fine compacted sands occurring adjacent to and

offshore of the band of larger materials. It is expected that small bodied fish species use the cobble and boulder substrates occurring along the shoreline at the proposed Project site.

Key fish species of economic importance occurring in the Traverse Bay area include walleye, lake whitefish, northern pike and sauger. To mitigate effects to fish and fish habitat the in-water works are currently scheduled to be conducted during the winter unless lake whitefish are found to be spawning in the project area. The presence or absence of lake whitefish spawning at the project site will be confirmed during a survey to be completed during fall 2018 prior to the start of construction.

Manitoba Sport, Culture and Heritage, Historic Resources Branch noted that the proposed project has the potential to impact heritage resources because there are several trade posts situated at the mouth of the Winnipeg River as it enters Traverse Bay, suggesting the area was well travelled and visited by Past Peoples. As such, in accordance with The Heritage Resources Act, a Heritage Resource Impact Assessment (HRIA) and appropriate mitigation, if necessary, will be conducted prior to the start of construction.

Based on the available information on the project and the environment, the assessment of environmental effects outlined in this environmental assessment report, and the application of proposed mitigation measures and the conduct of required follow-up, the proposed boat launch will not likely result in any significant residual adverse environmental effects.

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## 1.0 INTRODUCTION

Kontzamanis Graumann Smith MacMillan Inc. (KGS Group) was retained by the Rural Municipality (RM) of Alexander to prepare an Environment Act Proposal (EAP) for a boat launch into Lake Winnipeg. The proposed boat launch is required because the RM of Alexander no longer has access to the boat launch that was previously being used when it was transferred from federal to private operation.

KGS Group previously completed high level feasibility assessments for six potential boat launch locations in Traverse Bay, as described in Section 2.5. Following completion of the latest desktop review and preliminary site inspections completed in 2017, the RM of Alexander has decided to proceed with a detailed assessment and design of a boat launch located approximately 100 m south of Traverse Bay Road East. This site, as shown in Figure 1, was deemed the most feasible site for a boat launch. Photographs of the site are provided in Appendix A.

The boat launch will be designed for small and medium class motorboats and non-motorized boats. The boat launch facility will consist of an access ramp (from the access road and parking area), a staging and turn-around area, a boat launch ramp, a launching dock and two rockfill groynes to provide protection from wind and wave action. While not proposed to be installed during initial construction, the facility design provides space to accommodate the installation of several pipe pile floating docks in the future.

Assessment, design, and construction of an access road from Traverse Bay Road North to the proposed boat launch site and a parking area to accommodate up to 15 vehicles with trailers was completed in-house by the RM of Alexander.

Based on KGS Group's discussion with Manitoba Sustainable Development (MSD) Environmental Approvals Branch the proposed project is considered a Class 2 Development under *The Environment Act* (Manitoba). Additional approvals will be required by Transport Canada under the *Navigation Protection Act* and Fisheries and Oceans Canada (DFO) under the *Fisheries Act*, as described in Section 2.8.

## **2.0 DESCRIPTION OF DEVELOPMENT**

The following sections have been structured to address the requirements of the Description of Development as outlined in the EAP Form.

### **2.1 STATUS OF TITLE**

The project is located within the Rural Municipality of Alexander approximately 90 km northeast of Winnipeg. The access road constructed by the RM of Alexander off of Traverse Bay Road North and the land portions of the boat launch are located within SP Lot 2 Plan 19436 WLTP in a portion of the west half of Section 30, Township 19, Range 8 EPM (W ½ 30-19-8E). A copy of the Status of Title showing the RM of Alexander as the owner is provided in Appendix B.

### **2.2 MINERAL RIGHTS**

The status of title does not indicate the owner of mineral rights beneath the subject property and therefore it is assumed to remain with the Crown.

### **2.3 EXISTING AND ADJACENT LAND USE**

Land use in the vicinity of the proposed project will not change as a result of the project. The proposed site and immediately adjacent land is currently undeveloped and forested, with the exception of the access road recently constructed by the RM of Alexander and an abandoned cabin on the property (Appendix A: Photos 1 and 2). Land use in the surrounding area is a mix of undeveloped forested land along with residential houses and recreational cabins of Traverse Bay with the supporting infrastructure.

The land use adjacent the property is as follows:

- North – forested and residential houses and recreational cabins along Traverse Bay Road E (Appendix A: Photo 3)
- West – the boat launch access road, forested and residential houses and recreational cabins along Traverse Bay Road N (Appendix A: Photo 4)
- East – Lake Winnipeg
- South – forested and residential houses and recreational cabins along Fisherman Wharf Road

## 2.4 LAND USE DESIGNATION AND ZONING

The property is owned by the Rural Municipality of Alexander and is located in an area zoned as Seasonal Residential. The proposed project can be constructed in this zoning in accordance with By-law No. 04/16 which permits the RM to construct, maintain and operation any public work anywhere in any zone.

## 2.5 PREVIOUS STUDIES AND ACTIVITIES

### **Traverse Bay Boat Launch Feasibility Assessment, KGS Group, February 12, 2016 <sup>(1)</sup>**

An assessment of three potential sites was investigated from a geotechnical, environmental, and municipal perspective. The feasibility assessment of each site was based upon the spatial requirements for required infrastructure (parking, boat launch, floating dock, rock groyne), accessibility of each site, site-specific additional construction works and construction cost estimates. The potential sites considered for the boat launch facility included the following:

- Site 1: Northeast corner of Martin Drive and Traverse Bay Road N
- Site 2: East end of Sunrise Road
- Site 3: 550 metres south of Sunrise Road

The study was intended only as a high-level feasibility assessment to determine general feasibility and order of magnitude costs for a conceptual boat launch, and to determine whether more detailed investigation of any of the three sites was warranted. The assessment concluded that none of the sites were ideal and would incur high costs. As well, due to the shallow water depths at the sites there may be insufficient water depth to accommodate safe boat passage without physically altering the lake bed. It was recommended that if any of these locations were considered further that a bathymetric survey be conducted to confirm feasibility regarding water depths.

Following completion of the feasibility assessment two Open Houses were held during June 2016, one in Winnipeg and one in the RM of Alexander. The intent of the Open Houses was to present the conceptual boat launch sites and their estimated costs to the public in order to receive feedback on whether there was support to develop a boat launch.

### **Traverse Bay Boat Launch Feasibility Assessment; Phase 1000 – Desktop Review and Preliminary Site Inspections, KGS Group, February 2017 <sup>(2)</sup>**

An assessment of three additional potential boat launch sites was assessed based on a preliminary site inspection and desktop review.

- Site 1 – North Site: Located approximately 200 m ± south of Traverse Bay Road East.
- Site 2 – Central Site: Located south of Fisherman Wharf Road.
- Site 3 – South Site: Located north of David Drive.

The site inspections were completed in November 2016 to identify existing infrastructure, access and site conditions such as topography, drainage, bank height and slopes. The desktop review was completed following the site inspection and included an assessment of existing geological maps, groundwater drill logs, LIDAR and aerial imagery at the proposed boat launch locations. The sites were evaluated considering access, protection from waves, slope stability, bathymetric slope and water depth and existing infrastructure.

Based on the assessment, the report recommended Site 1 as more favourable than Sites 2 and 3. Unstable ground conditions and artesian groundwater noted at Sites 2 and 3 would require substantial effort and cost for stabilization and drainage works to provide a functional boat launch.

### **Traverse Bay Boat Launch Assessment and Preliminary Design Report, KGS Group, April 2018 <sup>(3)</sup>**

This work was a continuation from the Phase 1000 activities and included Field Investigations (Phase 2000) and Preliminary Engineering Design (Phase 3000). The Field Investigations included a site reconnaissance, topographic and bathymetric survey and geotechnical drilling. Site visits were completed in November 2017 and April 2018 at the Traverse Bay site as well as other existing boat launches in surrounding communities to obtain general arrangement and geometric information of currently functional facilities with high seasonal usage. A topographic survey was completed by KGS Group in January 2018 to determine the existing layout of the site including limits of the existing parking lot, access road, property pins/lines, tree lines and bank geometry. A bathymetric survey was completed by North/South Consultants Inc. in October 2017 as part of the aquatic environment assessment. The resulting data was used to develop elevation contours of the lake bed as shown on Figure 1. A drilling and sampling program consisting of six (6) test holes was completed by KGS Group in January, 2018, with the location of the test holes shown on Figure 1. Representative soil samples were obtained in all test holes directly off the auger flights and visually classified in the field. Cohesive (clay, silt) samples were field tested with a Field Torvane to evaluate consistency and estimate the undrained shear strength. A diagnostic laboratory testing program was performed on select representative soil samples to determine the relevant engineering properties of the subsurface soils relative to the riverbank stability assessment.

## **2.6 PROPOSED DEVELOPMENT**

### **2.6.1 Construction**

The boat launch facility, as shown in Figure 1, will consist of a 5 m wide access ramp with a 10% grade from the access road and parking lot previously completed by the RM of Alexander down to the boat launch landing area at El. 219.0 m±. Ditches will be constructed on each side of the access ramp with a 3H:1V back slope and a 1 m base width and tie into the 6h:1V embankment slopes. The boat launch landing area for staging and turning around will be approximately 10 m wide by 45 m long. The boat launch ramp will likely be precast concrete

blocks approximately 3 m wide with a 15% grade from the launch landing area to the dredged lake bottom at El. 216.25 m±.

Two rockfill groynes will be constructed to provide protection from wind and wave action (Figure 1). The groynes will have 2H:1V side slopes and a 2.0 m wide crest to facilitate access for construction and future maintenance. The North Groyne will be approximately 145 m long with a crest at El. 221.0 m± and after 75 m from the shoreline curve to the south around the end of the South Groyne to provide protection to the entrance of the boat launch. The South Groyne will be approximately 80 m long with a crest at El. 220.5 m±. Where the two groins are parallel they will be separated by approximately 45 m to provide space to accommodate the installation of several pipe pile floating docks in the future. The selected crest elevations for the groynes are approximately equal to a 1 in 10 year return period for wind setup and wave run-up at the current ordinary high water lake elevation of El. 217.5 m.

Trees will be felled and the bank excavated to a stable slope of 6H:1V for the access ramp and staging area with the material hauled off site for re-use or disposal. After the surficial soils have been excavated to the subgrade design elevation the native soil subgrade will be proof-roll compacted. The top 150 mm of subgrade will then be scarified and re-compact to 95% of Standard Proctor Maximum Dry Density (SPMDD). Areas that exhibit unsuitable deflection should be sub-excavated an additional 600 mm and replaced with compacted granular subbase. A light weight, non-woven geotextile should be placed for separation at the surface of the prepared subgrade soil prior to placing the granular base material. Geogrid should be placed, as required, in areas exhibiting soft behavior or potential for increased impact loading from vehicles. A 300-mm layer of gravel road surface will be placed with granular base materials placed in maximum 150 mm thick lifts and compacted to 98% SPMDD. The access ramp, roads, and loading/unloading area should be graded to prevent ponded water and promote positive surface drainage. The access ramp and roads should be crowned from the centerline down to the shoulders at a minimum 2%. The reshaped embankments will be revegetated with appropriate native grasses and potentially tree planting to provide additional stability.

The boat launch will be designed for small and medium class motorboats and non-motorized boats. The in-water construction for the boat launch will entail dredging for the rock groynes, concrete launch pad, and future docks, as well as, potential shoreline protection (rip rap).

Dredging will be completed using a backhoe with the material hauled off site for re-use or disposal. Suction dredging is not possible as it does not work for coarse till materials that are present at the site. The lake bottom will be dredged to El. 216.25 m± to provide 1.25 m of water depth for boat operation at the current ordinary high water lake elevation of El. 217.5 m. Rockfill riprap for the groynes will be placed starting at the shore and working out to provide a working platform. At the 4H:1V slope transition between the existing lake bottom and the dredged lake bottom, a layer of granular surfacing will be placed followed by rockfill riprap with an average diameter ( $D_{50}$ ) of 0.3 m to bring the toe of the groyne level with the average lake elevation and provide a stable foundation for the groyne. The remainder of the groyne will be constructed of rockfill riprap with a  $D_{50}$  of 0.7 m, which has been sized to withstand the wave action forces.

## 2.6.2 Operation and Maintenance

Anticipated maintenance items outlined in the feasibility studies included seasonal repairs to the launch ramp or rock groyne structures (and docks in the future); marking hazard rocks; re-grading of the gravel parking lot and access road and ramp; dredging to maintain the minimum channel depth; and general refuse cleanup.

Future dredging maintenance between and at the tip of the groynes may be required to maintain sufficient draft for several reasons. The groyne crest elevations were designed approximately equal to a 1 in 10 year return period for wind setup and wave runup. Suspended sediments transported by wave action may eventually accumulate in the area protected by the groynes as a result of overtopping. Based on the analysis of future sedimentation potential and shoreline evolution resulting from the groyne structures, the longshore currents may develop a bypassing shoal around the tips of the groynes. Additionally, sediment may accumulate in the navigation channel between the groynes from southeasterly waves.

## 2.6.3 Schedule

The RM of Alexander, as previously noted, has already constructed the access road from Traverse Bay Road North and the parking lot. Construction works for the boat launch will begin as soon as the appropriate approvals are received and would start with clearing the trees and excavating the embankment to provide access for the in-water works.

The in-water works are currently scheduled to be conducted during the winter, likely starting January 2019 and being completed by the end of March 2019. If lake whitefish (*Coregonus clupeaformis*) are found to be spawning in the project area, the in-water work would be delayed until the June 30 to September 15, 2019 timing window. The presence or absence of lake whitefish spawning at the project site will be confirmed during a survey to be completed during fall 2018. Revegetating the embankments would be completed during the spring of 2019, which would be the end of construction. Maintenance activities would be conducted on an annual basis as required.

#### **2.6.4 Funding**

The project will be funded by the Rural Municipality of Alexander.

### **2.7 STORAGE OF GASOLINE AND ASSOCIATED PRODUCTS**

Gasoline and associated products will be used at the site during construction of the boat launch. Equipment will be refueled from a fuel truck such that fuel will not be stored on site during construction. While boat owners will have fuel storage in their boats during operation, there is no requirement for these products to be permanently stored at the site.

### **2.8 OTHER APPROVALS**

Lake Winnipeg is a scheduled waterway under *The Navigation Protection Act* and the project components are not considered to be a minor works under the Act. As such, a Notice to the Minister will be required. The role of TC will be to determine if the proposed boat launch will interfere significantly with navigation on Lake Winnipeg, and whether further authorization is required. The Notice of Works Form was submitted to TC on April 4, 2018.

*The Fisheries Act* requires that projects avoid causing “serious harm” to fish unless authorized by the Minister. As the rock groynes will extend above the ordinary high water mark (OHWM), this component, as well as the dredging operations, may be considered serious harm under the Act and require Authorization. A Request for Review (RFR) form was submitted to DFO on November 29, 2017, describing the physical features of the boat launch and the fish and fish

habitat potentially affected. This RFR will be used by the DFO biologist to determine if serious harm to fish can be avoided. While a determination has not been made yet, the KGS Group Project Team has begun to develop the requirements for the DFO Application for Authorization and the associated Offsetting Plan under the assumption it will be required.

### **3.0 PHYSICAL ENVIRONMENT**

#### **3.1 LOCATION, PHYSIOGRAPHIC SETTING AND CLIMATE**

The project is located within the Rural Municipality of Alexander approximately 90 km northeast of Winnipeg. The location of the proposed boat launch is within W ½ 30-19-8E.

The project area is located within the Stead Ecodistrict of the Lake of the Woods Ecoregion and Boreal Shield Ecozone <sup>(4)</sup>. The Stead Ecodistrict lies within the borders of the ancient glacial Lake Agassiz basin. The topographic relief varies from a level to depressional glaciolacustrine plain. Local relief near Lake Winnipeg can occur between 3 to 30 m along a series of sandy and gravelly ridges and uplands. The existing topography and bathymetry of the Traverse Bay site is shown in plan and cross section on Figure 1. In general, the bank slopes gently from El. 226.5 m± at the west end of the existing parking (near TH18-02) to the edge of top of bank at El. 224.0 m± (near TH18-01). The edge of top of bank is defined by an existing apparent headscarp with numerous additional scarps located downslope of El. 224.0 m±. The bank then slopes approximately at 4H:1V over 8.2 m± to a mid bank bench at El. 222.0 m±. The bench width extends up to 4.5 m± before dropping at a steep 1.3H:1V slope over 4.6 m± to the existing shoreline at El. 218.5 m±. The lake shoreline slopes very gently from the existing shoreline out into Traverse Bay indicating that the water depth is relatively shallow (<1.0 m depth) for a distance of 75 m± from the shoreline.

The ecodistrict is within the Subhumid Low Boreal Ecoclimatic Region which is characterized by short, warm summers and long, cold winters <sup>(4)</sup>. The project is located approximately 20 km northwest of Pine Falls where the nearest climate data is recorded, and within the same ecodistrict. In Pine Falls, mean monthly air temperatures range from 19.3°C in July to -19.1°C in January <sup>(4)</sup>. The average annual precipitation reported in Pine Falls is 522.5 mm, with 414.3 mm falling as rain <sup>(4)</sup>.

#### **3.2 GEOLOGY AND HYDROGEOLOGY**

The regional surface geology consists of calcareous diamicton which is composed of a fine grained matrix with a high percentage of Paleozoic carbonate bearing clasts. As well, the

surface geology consists of shoreline sediments (beaches): a mix of sand and gravel approximately 1 to 2 m thick that is formed by waves at the margins of Lake Winnipeg <sup>(5)</sup>. Bedrock in the region is from the Pre Archean Era and consists of metamorphosed early intrusive rocks, such as gneisses and migmatites <sup>(5)</sup> from the Superior and Churchill province and Superior Boundary Zone. The bedrock subunits include tonalitic, minor granodiorite, and related gneiss, and the unit is tonalite gneiss <sup>(5)</sup>.

The variety of materials and drainage conditions in the Stead Ecodistrict has shaped the development of the soils in the area. Typical soils found in the depressional lowland area are poorly drained peaty Gleysol and Typic and Terric mesisols. Upland soils consist of imperfectly drained Dark Gray Chernozems that are developed on calcareous, sandy to loamy, thin and discontinuous veneers overlying calcareous, loamy to clayey, water-worked glacial till <sup>(4)</sup>. Luvisol soils are typically found in the areas with loamy, calcareous till uplands and Dark Gray Chernozems and Eutric Brunisols are typically found in areas with calcareous sandy till and sandy and gravelly glaciofluvial materials <sup>(4)</sup>.

Local geology was assessed based on five water well records within the vicinity (<600 m) of the project <sup>(6)</sup> (Appendix C). Well logs show surficial soils consisting of sand, clay, and/ or till layers to a depth of approximately 30 m. Granitic bedrock is identified beneath the surficial soils between depths of 30.8 m to 44.2 m <sup>(6)</sup>. Groundwater in the region is identified as artesian. Of the five wells closest to the project site, three were for domestic use and two were test wells. Piezometric monitoring completed by KGS Group at the site indicates that in general, the groundwater conditions within the upper bank area of the site (TH18-01) are interpreted to be static through the clay and till at an approximate elevation of El. 222.0 m± <sup>(3)</sup>. Groundwater levels fluctuate seasonally with lake levels and following precipitation events; therefore, the actual water level at the time of construction may differ from those in this report.

In general, the soil stratigraphy at the site has been interpreted by KGS Group to consist of high plasticity silty clay underlain by glacial sandy silt till <sup>(3)</sup>. Towards the center of the existing gravel parking lot (TH18-02), sandy gravel fill and a layer of silt was observed above the high plasticity silty clay. The glacial till was encountered at approximate elevations ranging from El. 216.3 to 219.8 m± with termination of the test holes occurring within the till at approximate elevations ranging from El. 206.0 to 216.8 m±.

### 3.3 SURFACE WATER

The Stead Ecodistrict is part of two drainage divisions. The west side is part of the Lake Winnipeg drainage division and the east side, and the subject property, is part of the Winnipeg River division. Both drainage divisions ultimately are part of the Nelson River drainage system<sup>(2)</sup>. The proposed Project location on Traverse Bay lies in close proximity to the mouth of the Winnipeg River where it enters the south basin of Lake Winnipeg. The Winnipeg River provides the largest flow inputs to Lake Winnipeg and, consequently, the aquatic environment at the Project location is influenced by physical processes and chemical conditions occurring in both waterbodies.

Water Survey of Canada maintains a gauge on Lake Winnipeg at Victoria Beach (Station #05SA003) located approximately 7 km overland from the project site. Historical data at this station illustrates the lakes annual pattern of rising in the spring with the spring freshet, peaking in the summer, and falling during the fall and winter months<sup>(7)</sup>. Lake Winnipeg has been regulated by Manitoba Hydro since 1976 under the terms of the Manitoba Water Power Act license. The operating range for the lake is 216.7 m to 217.9 m. Depending on hydrologic conditions; water levels can exceed or fall below the operating range for extended periods. During high inflow when the lake rises, Manitoba Hydro will maintain maximum outflow in order to return the lake to below 217.9 m. During times of drought outflow of the lake is determined by Manitoba Sustainable Development<sup>(8)</sup>.

Baseline water quality at the proposed Project site in Traverse Bay is anticipated to reflect the combined characteristics of Lake Winnipeg waters and those entering Traverse Bay from the Winnipeg River. Lake Winnipeg water is alkaline and characterized by high nutrient concentrations, particularly in the south basin due to input from the Red River. In contrast, water entering Traverse Bay from the Winnipeg River water is clearer and has lower nutrient concentrations than the Lake Winnipeg south basin.

Water quality data from 1999 to 2007 for the south basin of Lake Winnipeg had a mean summer water temperature of approximately 22 °C and mean open-water concentrations of dissolved oxygen, total phosphorus (TP) and total nitrogen (TN) greater than 8.4 mg/L, 0.113 mg/L and 0.869 mg/L, respectively<sup>(9)</sup>. Shallow water depth and wind driven mixing typically result in

uniform water temperature and dissolved oxygen concentrations throughout the water column, while the mean annual concentration of total suspended sediments (TSS) during the open-water season ranged from 7.7 to 17.4 mg/L<sup>(9)</sup>. Water quality data collected from 2008 to 2013 as part of the Coordinated Aquatic Monitoring Program (CAMP) indicates that mean TSS values in the Winnipeg River range from 3.8 to 4.9 mg/L, while summer TP and TN mean values ranged from 0.022 to 0.026 mg/L and 0.46 to 0.49 mg/L, respectively<sup>(10)</sup>.

### 3.4 VEGETATION

Vegetation within the Stead Ecodistrict generally varies with the surficial materials and drainage. Imperfectly drained sites, such as poorly drained clayey soils have vegetation species like meadow grasses, sedges, meadow prairie grasses and tall prairie grasses, while trees grow along streambanks. Parts of the natural terrain in the ecodistrict have been converted to agricultural land. Fen and bog peatlands are present in the ecodistrict. Fen peatlands consist of sedge-dominated vegetation with minor components of tamarack and shrubs, and bog peatlands are composed of black spruce, shrub, and moss vegetation<sup>(4)</sup>.

The Manitoba Conservation Data Centre (CDC) has developed a list of species of conservation concern that have been documented within the Lake of the Woods Ecoregion<sup>(11)</sup> (Appendix D). While there are several plant species considered rare in Manitoba and may be vulnerable to extirpation most of the listed species are globally secure and abundant. Additionally, the Biodiversity Information Manager, Manitoba CDC completed a search of the CDC rare species database and found no occurrences of provincially or federally listed species (*The Endangered Species and Ecosystem Act* [ESEA] and *Species At Risk Act* [SARA]) in the project area<sup>(12)</sup> (Appendix E). The vegetation at the proposed site consists of common species such as white spruce, birch, green ash, black spruce, trembling aspen, jack pine, cedar, dogwood and equisetum.

### 3.5 MAMMALS

Mammal species typical of the Lake of the Woods Ecoregion include black bear, wolf, lynx and snowshoe hare<sup>(4)</sup>. During a site visit in November 2017 wildlife or wildlife signs (ex: tracks, scat) observed included coyote. Other workers conducting geotechnical investigations have also

encountered black bear near the project site. During the November 2017 site visit several river otters were observed near the project site.

The star-nosed mole is the only mammal species tracked for this Ecoregion and while it is uncommon throughout its range in the province it is globally secure and abundant. As previously noted, the Biodiversity Information Manager, Manitoba CDC completed a search of the CDC rare species database and found no occurrences of provincially or federally listed mammal species (Appendix E).

### 3.6 BIRDS

Birds in the Lake of the Woods Ecoregion include ruffed grouse, hooded merganser, pileated woodpecker, bald eagle, turkey vulture, herring gull as well as many waterfowl and songbird species<sup>(4)</sup>. During the September 2017 site visit, avian species observed included a bald eagle. To provide additional site specific information about birds at the project site, the Manitoba Breeding Bird Atlas (MBBA) was reviewed. The project is within square 14PB71 of Region 5 of the MBBA. A total of 126 bird species have been recorded within this square (Appendix F). Of these bird species recorded in the area, 16 are considered species of conservation concern within the Lake of the Woods Ecoregion (see Appendix D for full list) and ten (10) of which are classified by the federal SARA as Schedule 1 species, described as follows;

- Bank swallow is provincially widespread (S5B) but is listed as Threatened under SARA. It is insectivorous and breeds in a wide variety of natural and artificial sites with vertical banks, including riverbanks, lake and ocean bluffs, aggregate pits, road cuts, and stock piles of soil. Breeding sites tend to be somewhat ephemeral due to the dynamic nature of bank erosion. Breeding sites are often situated near open terrestrial habitat used for aerial foraging such as grasslands, meadows, pastures, and agricultural cropland<sup>(13)</sup>.
- Barn swallow is provincially widespread (S4B) but is listed as Threatened under SARA. Nesting habitats are on artificial structures, including barns and other outbuildings, garages, houses, bridges, and road culverts<sup>(14)</sup>.
- Canada warbler is provincially uncommon (S3B) and is listed as Threatened under both ESEA and SARA. It uses a wide range of deciduous, coniferous and mixed forests, with a well-developed shrub layer and a structurally complex forest floor. It is most abundant in moist, mixed forests. It also occurs in riparian shrub forest on slopes and in ravines, in stands regenerating after natural and anthropogenic disturbances and in old-growth forests with canopy openings and a well-developed shrub layer<sup>(15)</sup>.

- Common nighthawk is provincially uncommon (S3B) and is listed as Threatened under ESEA and SARA. The breeding habitat is varied and includes open habitats where the ground is devoid of vegetation, such as sand dunes, beaches, logged areas, burned-over areas, forest clearings, rocky outcrops, rock barrens, prairies, peatbogs and pastures. It can also be found in urban areas where it uses flat gravel roofs for nesting<sup>(16)</sup>.
- Eastern wood-pewee is provincially widespread (S4B) and listed as Special Concern under SARA. In Canada, the eastern wood-pewee is mostly associated with the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in forest stands of intermediate age and in mature stands with little understory vegetation<sup>(17)</sup>.
- Golden-winged warbler is provincially uncommon (S3B) and is listed as Threatened under MESEA and SARA. The breeding habitats in general are areas that are logged, burned, and intermittently farmed. Preferred habitat examples include hydro/ utility right-of-ways, field edges, recently logged areas, and beaver marshes<sup>(18)</sup>.
- Olive-sided flycatcher is provincially uncommon (S3B) and is listed as Threatened under MESEA and SARA. The preferred habitat consists of open areas containing tall trees or snags for perching, such as forest openings, forest edges near natural openings (muskegs, rivers, bogs, or swamps) or human-made openings (logged areas), burned forest or open mature forest stands<sup>(19)</sup>.
- Western grebe is provincially widespread (S4B) and listed as Special Concern under SARA. The preferred nesting area consists of marshes and lakes with stands of emergent vegetation, stable water levels, large areas of open water, and ample populations of prey fish<sup>(20)</sup>.
- Whip-poor-will is provincially uncommon (S3B) and listed as Threatened under MESEA and SARA. Whip-poor-will breeding habitat is dependent upon forest structure rather than composition, although common tree associations in both summer and winter are pine and oak. The species avoids both wide-open spaces and closed-canopy forests. Semi-open forests or patchy forests with clearings, such as barrens or forests that are regenerating following major disturbances, are preferred as nesting habitat<sup>(21)</sup>.
- Yellow rail is provincially uncommon (S3B) and listed as Special Concern under SARA. Relatively little is known about this small, secretive rail. It is primarily restricted to shallow, dense, grassy marshes and wet meadows. Most of its breeding range (about 90%) is in Canada. It is relatively uncommon in most areas. Yellow rails nest in wet marshy areas of short, grass-like vegetation, usually sedge, that have an overlying dry mat of dead vegetation that they use to roof their nests<sup>(22)</sup>.

The six species identified as Threatened (eastern whip-poor-will, olive sided flycatcher, bank swallow, barn swallow, golden winged warbler, and Canada warbler) under SARA Schedule 1 are federally protected. As previously noted, a search of the CDC rare species database found no occurrences of provincially or federally listed birds in the project area (Appendix E).

### 3.7 AMPHIBIANS AND REPTILES

Reptile and amphibian species typical of the Lake of the Woods Eco-region include the northern leopard frog, wood frog, American toad, Cope's gray treefrog, boreal chorus treefrog, spring peeper, blue spotted salamander, red sided garter snake, common snapping turtle, and western painted turtle <sup>(23)</sup>. The northern leopard frog and common snapping turtle are provincially listed as a species of conservation concern (Appendix D) and are federally listed under the SARA as a species of special concern. As previously noted, a search of the CDC rare species database found no occurrences of provincially or federally listed amphibians or reptiles in the project area (Appendix E).

The northern leopard frog (*Lithobates pipiens*) is provincially widespread (S4) and globally secure (G5) but is federally listed as a species of special concern under SARA as it has experienced a considerable contraction of range and the loss of populations in the past, particularly in the west <sup>(24)</sup>. It is not provincially listed under ESEA. The population decline has been accompanied by increased isolation of remaining populations, which fluctuate widely in size, with some showing signs of recovery. The northern leopard frog uses a variety of habitats to meet its needs. They overwinter in well-oxygenated water bodies which do not freeze solid <sup>(24)</sup>. Breeding and larval life generally occurs in pools, ponds, marshes and lakes between April and June. A typical breeding pond is 30 to 60 m in diameter and 1.5 to 2.0 m deep which have abundant vegetation and no fish. Moist upland meadows and native prairie are used during the summer <sup>(24)</sup>. The species is adversely affected <sup>(24)</sup> by habitat conversion, including wetland drainage and eutrophication, game fish introduction, collecting, pesticide contamination and habitat fragmentation that curtails recolonization and rescue of declining populations.

The snapping turtle (*chelydra serpentina serpentina*) is provincially uncommon throughout its range or in the province (S3) and globally secure (G5) but is federally listed as a species of special concern under SARA. While the species is widespread, it is susceptible to anthropogenic threats due to its breeding pattern (late maturity, great longevity, low recruitment, lack of density-dependent responses) and dependence on long, warm summers to complete incubation <sup>(25)</sup>. It is not provincially listed under ESEA. The snapping turtle occupy a wide variety of habitats, however, the preferred habitat consists of slow-moving water with a soft mud bottom and dense aquatic vegetation. They overwinter in water bodies which do not freeze solid in lotic,

lentic, and mud environments <sup>(25)</sup>. Breeding is most common in the spring and fall with the female laying eggs between late May and late June. Eggs are laid in sand and gravel banks near water, in areas where vegetation is sparse <sup>(25)</sup>.

### 3.8 FISH AND AQUATIC HABITAT

Fish habitat at the Project site was assessed by North South Consultants on October 31, 2017 through digital photographs, hydroacoustic survey and substrate samples. The full aquatic environment description is provided in Appendix G, with the fish and fish habitat summarized in the following sub-sections.

#### 3.8.1 Fish

It is assumed that species occurring in Lake Winnipeg and the Winnipeg River could occur at the Project site. Stewart and Watkinson identified 70 fish species in Lake Winnipeg and 74 from the Winnipeg River, of which 60 are native to Lake Winnipeg and 61 are native to the Winnipeg River <sup>(26)</sup>. The rest of the species occurring in each waterbody are those that have recently colonized the area through naturally occurring shifts in range distribution or were accidentally or purposefully transplanted.

Based on observations from fish collections at other locations along the south shore in Traverse Bay, it is expected that all life stages of small bodied species such slimy sculpin (*Cottus cognatus*), mottled sculpin (*C. bairdi*), trout-perch (*Percopsis omiscomaycus*) and longnose dace (*Rhinichthys cataractae*), as well as juvenile burbot (*Lota lota*) can be found in the cobble and boulder substrates occurring along the shoreline at the proposed Project site. Species likely occurring in nearshore areas with fine grained substrates include logperch (*Percina caprodes*), blackside darter (*Percina maculata*), and johnny darter (*Etheostoma nigrum*). Emerald shiner (*Notropis atherinoides*) and spottail shiner (*Notropis hudsonius*) are expected to be common in nearshore areas, as are young-of-the-year stages of walleye (*Sander vitreus*), sauger (*Sander canadensis*), and white bass (*Morone chrysops*). Juvenile stages of pelagic predatory species such as walleye, sauger, and white bass occupy deeper habitat characterized by fine sand substrates such as those occurring farther offshore at the Project site. It is expected that other

predatory species such as rock bass (*Ambloplites rupestris*) may occur along the periphery of nearshore areas characterized by cobble and boulder substrates.

Key species of economic importance occurring in the Traverse Bay area include walleye, lake whitefish, northern pike (*Esox lucius*) and sauger. Each is an integral component of the Lake Winnipeg commercial fishery<sup>(27, 28)</sup>, and walleye are targeted in large recreational fisheries occurring in Traverse Bay and the Winnipeg River downstream of Pine Falls.

A search of the CDC rare species database found no occurrences of provincially or federally listed aquatic species in the project area (Appendix E). Aquatic species at risk maps produced by DFO suggest that only the bigmouth buffalo (*Ictiobus cyprinellus*), which is designated as Special Concern under SARA (Schedule 3), may occur in the vicinity of the Project<sup>(29)</sup>. The carmine shiner (*Notropis percobromus*), which is listed as Threatened under SARA, is unlikely to occur at the Project site as its distribution in Manitoba is limited to the Winnipeg River at the base of Whitemouth Falls and its tributaries.

### 3.8.2 Fish Habitat

Shoreline conditions at the Project site were characterized by steep banks approximately 3 m in height and a narrow beach comprised of mixed gravel and cobble interspersed with boulders (Appendix A, Photo 1). The shoreline has been armoured with large boulders along the fronts of some residential properties in the area and, at two locations immediately to the north of the Project site, the remnants of previously placed rock groins occur. Water depth at the site increased gradually to an approximate mean depth of 2.0 m about 325 m offshore. Substrate conditions were consistent throughout the survey area and were comprised of a band (~ 50 m) of larger substrate materials (gravels, cobble, and boulders) in shallow water along the shoreline and a narrow band (~ 25 m) of fine compacted sands occurring adjacent to and offshore of the band of larger materials (Appendix G - Figure 5). Substrates farther offshore were comprised exclusively of fine uncompacted sands (Appendix G - Figures 5 and 6). No aquatic macrophytes were observed, but small amounts of plant material were observed in a single substrate sample collected at the northern extent of the survey area.

### 3.9 SOCIOECONOMIC

The RM of Alexander stretches from the eastern shores of Lake Winnipeg east into the Whiteshell Provincial Park and north into the Canadian Shield. The 1,521 km<sup>2</sup> region is serviced by six modern highways, offers parkland, beaches, forest, agriculture, industry and the amenities of both urban and rural settings, and is the hydro power centre of Manitoba.

The RM of Alexander had a population of 3,333 according to the 2016 census<sup>(30)</sup> living in 1,602 of its 4,144 private dwellings, but the population grows to more than 20,000 in the summer. The Belair Provincial Forest can be found in the westernmost part of the RM and the northern half of Brightstone Sand Hills Provincial Forest in its central part. There are eight independent water facilities servicing the RM of Alexander and three waste disposal sites. All primary roads are paved. Secondary roads are graded, graveled and have dust control applied in some areas.

Within approximately 15 km of the site there are several small recreational beach communities including Grand Marais, Lester Beach, Belair, Hillside Beach, Victoria Beach, Wanasing Beach and Albert Beach. Lac du Bonnet which is an incorporated urban centre is the nearest large town, approximately 50 km southeast of the proposed site and approximately 80 km northeast of Winnipeg just off of Provincial Trunk Highway #11. Lac du Bonnet is a major rural service centre in southeastern Manitoba and has several grocery stores, a pharmacy, a post office, a community resource centre, and several banks. There is a Health Centre and a Royal Canadian Mounted Police detachment. Lac du Bonnet has an elementary school for kindergarten to grade 6 and a high school for grades 7 to 12.

The Birch Landing Indian Reserve (Parcel A), which is undeveloped land held by the Brokenhead Ojibway Nation, is the nearest Aboriginal land approximately 7 km west of the proposed Project<sup>(31)</sup>. The Brokenhead Ojibway Nation is located approximately 34 km south of the Project and has a registered population of 2,094<sup>(31)</sup>. The Fort Alexander First Nation (IR No. 3) is located approximately 8.5 km southeast of the Project and has a registered population of 7,939<sup>(31)</sup>. The Black River First Nation (IR No. 9) is located approximately 19.5 km northeast of the Project and has a registered population of 1,404<sup>(31)</sup>. The Brokenhead Ojibway Nation and Black River First Nation are both part of the Southeast Resource Development Council. Several

other First Nations are located on or near the shoreline of Lake Winnipeg, however, they are all greater than 30 km from the Project.

The proposed project is located on private land within an area zoned as Seasonal Residential, as noted in Section 2.4, and therefore Aboriginal treaty rights of hunting and trapping are already not permitted and therefore will not be affected. Similarly the proposed project will not affect the Aboriginal treaty right of fishing in Lake Winnipeg based on the assessment described in Section 4.9.

### **3.10 HERITAGE RESOURCES**

The Heritage Resources Registrar of the Manitoba department of Culture, Heritage, and Tourism, Historic Resources Branch, examined Branch records, which contain data pertaining to previously reported heritage sites and resources, and indicated that there are no known archaeological or heritage resources in the project area (Appendix E). Historic Resources Branch completed a heritage screening and noted that the proposed project has the potential to impact heritage resources because there are several trade posts situated at the mouth of the Winnipeg River as it enters Traverse Bay, suggesting the area was well travelled and visited by Past Peoples (Appendix E). As such, in accordance with The Heritage Resources Act, a Heritage Resource Impact Assessment (HRIA) and appropriate mitigation, if necessary, will be conducted prior to the start of construction.

## **4.0 POTENTIAL ENVIRONMENTAL EFFECTS ASSESSMENT**

An environmental effect includes any change that the project may cause to the environment (biological, physical, social and economic). Environmental effects were identified from interactions between project activities and environmental components. Because the proposed boat launch is replacing a previously used boat launch (in another area that is no longer accessible), with the exception of dredging the boat launch area during maintenance, there will generally be no change in effects associated with operation of the boat launch. As such the effects assessment described in the following sections focuses on potential effects associated with construction activities. Additionally, maintenance dredging would be done, as required, during the winter time when the ice is frozen to the lake bed and therefore effects would be similar to the initial construction effects described herein. Mitigation measures and follow-up activities were identified for environmental effects determined to be adverse.

### **4.1 AIR QUALITY**

Construction activities will result in temporary increases in fugitive dust levels, greenhouse gases and vehicle emissions in the local area. Dust may be generated during construction activities such as tree clearing, grubbing, excavating, and spreading and compaction of gravel materials as well as from vehicle and construction equipment accessing the site. Increased volatile organic carbon (VOC) levels will result from fuels and other hazardous substances used during construction activities. It is unlikely that Manitoba's air quality guidelines would be exceeded during construction and any effects would be very short term. Therefore the potential adverse effects on air quality were assessed to be negligible. The effects will be mitigated by using an approved dust suppressant such as water, controlling construction vehicle speeds, limiting construction activities during high wind events, and re-establishing vegetation on disturbed areas. Mitigation measures to control increased greenhouse gases and vehicle emissions include requiring a high standard of maintenance for construction equipment and vehicles, limiting unnecessary long-term idling, using low sulphur-containing fuels, and limiting fueling of vehicles and equipment on-site.

## 4.2 SOILS

Soils in the project area may become contaminated during construction from leaks and accidental spills or releases of fuels or other hazardous substances and waste. Potential spills would be restricted to a small area and immediately cleaned up. The potential adverse effects on soil quality were assessed to be minor. Proposed mitigation includes preventing leaks, spills and releases by using an approved fuel truck for refuelling, requiring drip trays for equipment, providing fuel handling training for operators, providing spill clean-up equipment and materials, complying with provincial fuel storage and dispensing regulations, storing hazardous materials in approved containers, providing an emergency (spill) response plan and periodic inspection for leaks, spills and releases. If a spill should occur the contractor would be responsible to notify the MSD Emergency Response Program (204-944-4888) and the appropriate clean-up would be determined according to the size of spill and quantity of contamination. Small spills could be treated on site with regular working of the soil to aerate. Larger spills, however, would be assessed and delineated following Phase III Environmental Site Assessment standards and a remediation program would be developed to ensure that the site is cleaned to meet MSD soil remediation criteria.

## 4.3 GROUNDWATER

Groundwater in the project area may become contaminated during site preparation and construction from leaks, accidental spills, or releases of fuels or other hazardous substances. Groundwater quality at the site has not been tested for hydrocarbons. Potential spills would be restricted to a small area and immediately cleaned up. The soil in the area generally consists of high plasticity silty clay underlain by glacial sandy silt till restricting groundwater migrations. Groundwater in the region is identified as artesian with an upward gradient, although it is not flowing at the site. The nearest domestic well is approximately 150 m southwest of the site but it likely obtains water from the deep bedrock aquifer below the clay till aquaclude. As it is very unlikely that a spill would reach any groundwater before it is cleaned up the potential adverse effects on groundwater quality were assessed to be negligible. The mitigation measures outlined in Section 4.2 above for soil contamination will also mitigate groundwater contamination from leaks, spills and releases.

#### **4.4 SURFACE WATER**

Surface water in the project area may become contaminated during construction from leaks and accidental spills or releases of fuels or other hazardous substances. Vegetation removal and improper construction practices can result in erosion of soils that may result in the transport of sediment to Lake Winnipeg. Additionally, in-water work (dredging and placing rockfill) can increase turbidity levels and the transport of suspended sediments. Equipment refueling will be completed at least 100 m from Lake Winnipeg. In-water components of the project are proposed to be completed during the winter when the ice is frozen to the lake bottom so that the affected area is isolated from flowing water. The potential adverse effects on water quality were assessed to be moderate. The mitigation measures outlined in Section 4.2 above to reduce the potential effects to soil from leaks, spills or releases of fuel and hazardous materials would also mitigate potential effects to surface water quality. Any spill in a waterbody or watercourse would be reported to MSD immediately by calling the 24-hour emergency spill number. Excavated embankment and dredged lakebed materials will be disposed of off-site. Any erodible materials temporarily stockpiled on-site will be located a minimum 100 m from Lake Winnipeg. Exposed embankment soils (i.e. until revegetated) and road building materials will be monitored, particularly following major rain events, to ensure erosion is not resulting in the transport of material to Lake Winnipeg. If transport of material is observed, appropriate sediment and erosion control measures will be implemented (silt fence, straw wattles). Likewise if in-water work has to be conducted during the summer, as discussed in Section 2.6.3, then a turbidity curtain would be placed around the construction site to isolate the in-water work.

#### **4.5 VEGETATION**

The project will result in the permanent loss of a small amount of vegetation due to clearing for the access ramp. Additionally the vegetation will be cleared for the embankment stabilization but this area will be re-vegetated. Vegetation which will be removed consists of undisturbed forest; however, as no rare or protected plant species were identified in the project area and the overall project footprint is small the potential adverse effects on vegetation were assessed to be negligible. Mitigation measures include minimizing disturbance of vegetation by limiting construction activities to designated and previously disturbed areas as much as possible and re-vegetating disturbed or reclaimed areas after construction.

#### 4.6 MAMMALS

Construction of the boat launch facility will result in the loss and disturbance of vegetation and mammal habitat. Given that the CDC found no occurrences of rare or endangered plant and wildlife species at the project area, and the overall project footprint is small, the potential adverse effects on mammals were assessed to be negligible. Mitigation measures include minimizing loss and disturbance of vegetation and mammal habitat by limiting construction activities to designated and previously disturbed areas as much as possible, and re-vegetating disturbed or reclaimed areas after construction.

#### 4.7 BIRDS

Construction of the boat launch facility will result in the loss and disturbance of vegetation and avian habitat. In particular the access ramp and embankment stabilization will require clearing a small area of undisturbed forest which provides habitat for a variety of bird species. As discussed in Section 3.6, a review of the MBBA identified the presence of 10 species of conservation concern within the Lake of the Woods Ecoregion which are classified by the federal SARA as Schedule 1 species, including the bank swallow, barn swallow, Canada warbler, common nighthawk, eastern wood-pewee, gold-winged warbler, olive-sided flycatcher, western grebe, whip-poor-will and yellow rail. Based on habitat requirements previously discussed for these 10 species of conservation concern, only Canada warbler, eastern wood-pewee, olive-sided flycatcher and whip-poor-will could use the project area. However, the CDC found no occurrences of rare or endangered bird species at the project area (Appendix E). Therefore the potential effects on birds as a result of the project are expected to be minor. Mitigation measures to implement include minimizing loss and disturbance of vegetation and avian habitat by limiting construction activities to designated and previously disturbed areas as much as possible and re-vegetating disturbed or reclaimed areas after construction. In particular, tree clearing will be completed in the winter in accordance with the *Migratory Birds Convention Act*, specifically outside of critical nesting and rearing periods of mid-April to late-August for nesting zone C4.

#### **4.8 AMPHIBIANS AND REPTILES**

Construction of the boat launch facility will result in the loss and disturbance of forested vegetation and dredging of the lakebed that may provide habitat for amphibians and reptiles. The areas that will be disturbed do not provide appropriate habitat for either the northern leopard frog or common snapping turtle, as described in Section 3.7. Additionally the CDC found no occurrences of rare or endangered amphibian or reptile species in the project area. Due to the lack of suitable habitat, the limited project footprint, and the project schedule, the impact of the Project on amphibians and reptiles was assessed to be negligible. Mitigation measures will include minimizing loss and disturbance of vegetation, limiting construction activities to designated areas, reporting sightings of rare species, installing sediment and erosion control measures as required, and re-vegetating disturbed and reclaimed areas to restore potential habitat.

#### **4.9 FISH AND AQUATIC HABITAT**

Introduction of deleterious substances into watercourses from spills or releases of fuel or hazardous materials associated with construction equipment can reduce surface water quality, resulting in toxic effects to aquatic organisms, including fish. Hydrocarbons (ex: oil, fuel, gasoline, lubricants, or hydraulic fluids) can enter watercourses during the use, maintenance and fuelling of construction vehicles and machinery near watercourses. Deleterious substances may kill fish or other aquatic biota directly, or may result in impaired health, vigor, or productive capacity. The effect of the Project on fish from introduction of deleterious substances was assessed to be minor. The mitigation measures outlined in Section 4.2 above to reduce the potential effects to soil from leaks, spills or releases of fuel and hazardous materials would also mitigate potential effects to surface water quality and associated effects to aquatic organisms. Additionally equipment refueling will be completed at least 100 m from Lake Winnipeg.

Erosion and sedimentation from construction activities causing suspension and deposition of sediments may decrease surface water quality, as described in Section 4.4. There are multiple negative effects associated with increased levels of suspended and deposited sediment, including effects to primary producers, invertebrates and fish. A decrease in light penetration due to higher turbidity (suspended sediment) can lead to decreased photosynthesis by primary

producers and affect the food chain for higher trophic levels, such as invertebrates and fish. Large influxes of deposited sediment can bury aquatic invertebrates, an important food item for many fish species, resulting in reduced invertebrate species diversity and abundances. Fine sediment deposition over existing larger substrates may result in habitat loss for invertebrate species that anchor to coarse substrates. Sedimentation may also result in the loss of spawning habitats and/or decreased spawning success for some fish species. Infilling of existing coarse or rocky substrates with finer materials may create unsuitable spawning habitat for some fish species, smother deposited eggs or inhibit larval emergence from spawning substrates. The effect of the Project on fish and fish habitat from increased erosion and sedimentation was assessed to be moderate. In-water components of the project are proposed to be conducted during the winter when the ice is frozen to the lake bottom so that the affected area is isolated from flowing water. Excavated embankment and dredged lakebed materials will be disposed of off-site. Any erodible materials temporarily stockpiled on-site will be located a minimum 100 m from Lake Winnipeg. Exposed embankment soils (i.e. until revegetated) and road building materials will be monitored, particularly following major rain events, to ensure erosion is not resulting in the transport of material to Lake Winnipeg. If transport of material is observed, appropriate sediment and erosion control measures will be implemented (silt fence, straw wattles). Likewise if in-water work has to be conducted during the summer, as discussed in Section 2.6.3, then a turbidity curtain would be placed around the construction site to isolate the in-water work and a fish salvage conducted prior to starting the in-water work.

The Project would result in the alteration and loss of fish habitat along the shorelines associated with the in-water components including dredging and the rockfill groynes. The DFO Fisheries Protection Biologist indicated that DFO uses the 80<sup>th</sup> percentile Lake Winnipeg water level (217.5 masl or 713.6 ft) as the Ordinary High Water Mark (OHWM) to define fish habitat. Approximately 2,016 m<sup>2</sup> of fish habitat will be permanently lost (infilled) below the OHWM associated with construction of the rockfill groynes. An additional 2,611 m<sup>2</sup> of fish habitat will be altered associated with construction of the rockfill groynes (755 m<sup>2</sup>) and dredging of the lake bottom (1,856 m<sup>2</sup>). These areas lost and altered, will however, be partially offset by approximately 678 m<sup>2</sup> of fish habitat created by excavating and dredging the area currently above the OHWM to provide the depth required for the boat launch. The habitat being lost or altered consists of larger substrate materials (gravels, cobble, and boulders) in shallow water along the shoreline followed by fine compacted sands transitioning into uncompacted sands

further from the shoreline. These habitat conditions are not unique or limiting as they occur along the entire shoreline of Traverse Bay. Regardless, because fish habitat is federally protected the loss and alteration of fish habitat was assessed as moderate. Where habitat loss is unavoidable and where required by DFO, an offsetting plan would be developed and implemented as approved by DFO.

The use of equipment in water during construction could increase the risk to spread aquatic invasive species (ex: zebra mussels). The introduction and spread of invasive species can reduce the diversity and populations of native species and can modify habitat <sup>(32)</sup>. Aquatic invasive species, in particular zebra mussels, are already present in Lake Winnipeg and therefore could be transported from the Project area on construction machinery and equipment to other waterbodies. Equipment of particular concern includes water tanks, tank trucks, pumps, hoses, intake screens, boats and motors as well as fish and water monitoring equipment. Because the in-water work is scheduled to be conducted during the winter time it is anticipated that invasive species on the equipment would not survive. Therefore construction of the proposed Project poses no additional risk of transporting aquatic invasive species. Regardless, to mitigate against the potential spread of aquatic invasive species, any equipment which has previously been in contact with an aquatic ecosystem in Manitoba with known aquatic invasive species and any equipment used during construction of this project that comes in contact with Lake Winnipeg must be properly cleaned so as to prevent the spread of aquatic invasive species. This equipment must be cleaned, drained, dried and inspected before and after in-water work.

#### **4.10 EMPLOYMENT / ECONOMY**

The overall scale of the project is relatively small, however the project may create temporary construction employment opportunities and increase the economy in the local and surrounding areas associated with purchase of construction materials, fuel, supplies and lodgings. Construction of the boat launch will also contribute positively to the employment and economy in the immediate area as it provides increased recreational opportunities. As the effect is positive, no mitigation or follow-up has been proposed.

#### **4.11 HUMAN HEALTH AND WELL BEING**

Soil, surface water and groundwater in the project area may become contaminated during construction activities, from leaks and accidental spills or releases of hazardous substances, which could adversely affect human health. Any potential spills would be immediately cleaned up as previously described with no migration off-site or potential to impact groundwater. Therefore the potential adverse effects of the project on human health were assessed to be negligible. The mitigation measures outlined in Section 4.2 above to reduce the potential effects to soil, surface water and groundwater from leaks, spills or releases of fuel and hazardous materials would also mitigate potential effects to human health.

#### **4.12 PUBLIC AND WORKER SAFETY**

The potential hazards to public and worker health and safety include use of heavy machinery and handling and storage of fuels and hazardous materials (ex: greases and lubricants). The nearest residence is approximately 150 m southwest of the site and public access to the construction area will be limited. The potential hazard to worker safety will only be for a short construction period. Therefore the potential effect to health and safety was assessed as minor. In addition to restricting public access to the site during construction proposed mitigation includes providing appropriate personal protective equipment (PPE) for workers, providing fuel handling training for operators, complying with provincial fuel storage and dispensing regulations, storing hazardous materials in approved containers, complying with *The Workplace Safety and Health Act* (Manitoba) and regulations, conducting safety briefings with workers and providing employee training.

#### **4.13 HERITAGE RESOURCES**

The Heritage Resources Registrar at the Manitoba department of Culture, Heritage, and Tourism, Historic Resources Branch examined Branch records, which contain data pertaining to previously reported heritage sites and resources, and indicated that there are no known archaeological or heritage resources in the project area (Appendix E). The proposed access ramp and embankment stabilization will only require a small amount of excavation or removal of soils with part of the area previously disturbed when the RM of Alexander constructed the

access road and parking lot. Historic Resources Branch completed a heritage screening and noted that the proposed project has the potential to impact heritage resources because there are several trade posts situated at the mouth of the Winnipeg River as it enters Traverse Bay, suggesting the area was well travelled and visited by Past Peoples (Appendix E). As such, in accordance with The Heritage Resources Act, a HRIA and appropriate mitigation, if necessary, will be conducted prior to the start of construction. The HRIA will identify and log any archaeological or heritage artifacts at the site, however, if any additional items are uncovered during the project, work will be stopped and the proponent will contact the Historic Resources Branch for further direction.

## 5.0 ENVIRONMENTAL MANAGEMENT PRACTICES

Environmental management practices proposed to be employed to prevent or mitigate environmental effects that were determined to be adverse, as described in Section 4.0, are summarized in the following sections. Mitigation is defined under the *Canadian Environmental Assessment Act* as the elimination, reduction and control of the adverse effects of a project and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means. Mitigation measures must be technically and economically feasible, and implemented.

### 5.1 AIR QUALITY

Applying an approved dust suppressant such as water, controlling construction vehicle speeds, limiting construction activities during high wind events, and re-establishing vegetation on disturbed areas will mitigate increased fugitive dust levels generated during construction activities. By controlling fugitive dust levels it is unlikely that Manitoba's air quality guidelines would be exceeded during construction activities.

Requiring a high standard of maintenance for construction equipment and vehicles, limiting unnecessary long-term idling, using low sulfur-containing fuels and limiting fueling of vehicles and equipment on-site, will mitigate increased levels of greenhouse gases and vehicle emissions from equipment and increased VOC levels from fuels and other substances during construction activities.

### 5.2 SOILS

Preventing leaks, spills and releases by using an approved fuel truck for refuelling, requiring drip trays for equipment, providing fuel handling training for operators, providing spill clean-up equipment and materials, complying with provincial fuel storage and dispensing regulations, storing hazardous materials in approved containers, providing an emergency (spill) response plan and periodic inspection for leaks, spills and releases will mitigate potential soil contamination from leaks and accidental spills during construction.

### **5.3 GROUNDWATER**

The mitigation measures outlined in Section 5.2 above for soil contamination will also mitigate groundwater contamination from leaks, spills and releases.

### **5.4 SURFACE WATER**

The mitigation measures outlined in Section 5.2 to reduce the potential effects to soil from leaks, spills or releases of fuel and hazardous materials would also mitigate potential effects to surface water quality. Excavated embankment and dredged lakebed materials will be disposed of off-site and any erodible materials temporarily stockpiled on-site will be located a minimum 100 m from Lake Winnipeg. If construction activities result in erosion of soils, erosion and sediment control measures will be implemented (ex: silt fence, straw wattles) to mitigate release of sediments to surface water. Likewise if in-water work has to be conducted during the summer, as discussed in Section 2.6.3, then a turbidity curtain would be placed around the construction site to isolate the in-water work.

### **5.5 VEGETATION**

Limiting the area cleared during construction, limiting construction activities to designated and previously disturbed areas as much as possible, and re-vegetating disturbed or reclaimed areas after construction will minimize loss and disturbance of vegetation and mitigate effects on vegetation.

### **5.6 MAMMALS**

Limiting the area cleared during construction, limiting construction activities to designated and previously disturbed areas as much as possible, and re-vegetating disturbed or reclaimed areas after construction will mitigate effects on mammals and mammal habitat.

## 5.7 BIRDS

Minimizing the loss and disturbance of vegetation by limiting construction activities to designated and previously disturbed areas as much as possible and re-vegetating disturbed or reclaimed areas after construction will mitigate effects to birds and bird habitat. For areas that have to be cleared tree clearing will be completed in the winter in accordance with the *Migratory Birds Convention Act*, specifically outside of critical nesting and rearing periods of mid-April to late-August for nesting zone C4.

## 5.8 AMPHIBIANS AND REPTILES

Limiting the area cleared during construction, limiting construction activities to designated and previously disturbed areas as much as possible, installing sediment and erosion control measures as required, and re-vegetating disturbed or reclaimed areas after construction will minimize loss and disturbance to amphibians and reptiles and their habitat.

## 5.9 FISH AND AQUATIC HABITAT

The mitigation measures outlined in Section 5.2 to reduce the potential effects to soil from leaks, spills or releases of fuel and hazardous materials would also mitigate potential effects to surface water quality and associated effects to aquatic organisms. Additionally equipment refueling will be completed at least 100 m from Lake Winnipeg.

In-water components of the project will be constructed during the winter when the ice is frozen to the lake bottom so that the construction site is isolated from fish and flowing water that would transport sediments. Excavated embankment and dredged lakebed materials will be disposed of off-site and any erodible materials temporarily stockpiled on-site will be located a minimum 100 m from Lake Winnipeg. If construction activities result in erosion of soils, erosion and sediment control measures will be implemented (ex: silt fence, straw wattle) to mitigate release of sediments to surface water and associated impacts on fish and fish habitat. Likewise if in-water work has to be conducted during the summer, as discussed in Section 2.6.3, then a turbidity curtain would be placed around the construction site to isolate the in-water work.

Mitigation measures to reduce the alteration and loss of shoreline and in-water habitat includes minimizing vegetation clearing and disturbance as well as reclamation of disturbed areas following construction. Machinery access for in-water work would be limited to the boat launch access ramp. Where habitat loss is unavoidable and where required by DFO, an offsetting plan would be developed and implemented as approved by DFO. Potential offsetting options listed below are based on our consultation with North/South Consultants Inc. and our recent in-house experience with fish habitat offsetting works on other projects of this nature. The potential offsetting options below are under consideration at this time.

- Provide boulder areas on the exterior and deeper section of the groynes to provide / support habitat diversity in the vicinity of the launch.
- Provide boulder areas / reefs in deeper water to provide / support habitat diversity in the vicinity of the launch.
- Remediation of watercourse constraints within the RM of Alexander, including the removal of obstacles to fish passage (ex: abandoned culverts) and fish habitat enhancements in local watercourses that are currently limiting to fish productivity.
- Restoration of natural drainage patterns, flow and habitat enhancement, where applicable.
- Naturalization of drainage channels in the study area.
- Improvements in shoreline stability along upstream watercourses using plant based approaches including site restoration and reforestation to reduce sedimentation and nutrient loading which have been identified as detrimental to the health of Lake Winnipeg.
- Invest in data collection and scientific research related to maintaining or enhancing the productivity of commercial, recreational or Aboriginal fisheries.
- Conduct study of zebra mussel colonization on the new groynes or benthic invertebrate abundance in the Winnipeg River downstream of Pine Falls to support Lake Sturgeon recovery efforts.

To mitigate against the potential spread of aquatic invasive species, any equipment which has previously been in contact with an aquatic ecosystem in Manitoba with known aquatic invasive species and any equipment used during construction of this project that comes in contact with Lake Winnipeg must be properly cleaned so as to prevent the spread of aquatic invasive species. This equipment must be cleaned, drained, dried and inspected before and after in-water work.

## 5.10 HUMAN HEALTH AND WELL-BEING

The mitigation measures outlined in Section 5.2 to 5.4 related to soil, surface water and groundwater contamination from leaks, spills and releases will also mitigate human health and well-being concerns.

## 5.11 PUBLIC AND WORKER SAFETY

Restricting public access to the site during construction will mitigate public safety. Providing appropriate PPE for workers, providing fuel handling training for operators, complying with provincial fuel storage and dispensing regulations, storing hazardous materials in approved containers, complying with *The Workplace Safety and Health Act* (Manitoba) and regulations, conducting safety briefings with workers and providing employee training will mitigate the threat to worker health and safety during construction.

## 5.12 RESIDUAL ENVIRONMENTAL EFFECTS

The significance of residual environmental effects, the effects remaining after the implementation of mitigation measures, was evaluated following procedures outlined in the Canadian Environmental Assessment Agency, Operation Policy Statement “Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects under the *Canadian Environmental Assessment Act, 2012*”<sup>(33)</sup>. The degree of change from the existing conditions and the value of the environmental components being affected determine the significance of an adverse effect. Criterion for this determination include:

- **Societal value** of the affected environmental components – includes nature and degree of protection provided
- **Ecological value** – includes rarity and uniqueness, fragility, importance within ecosystem, importance to scientific studies
- **Duration** – length of time the project activity will last
- **Frequency** – rate of reoccurrence of the project activity causing the effect
- **Geographic extent** – area over which the effect will occur

- **Magnitude** – predicted disturbance compared to existing conditions
- **Timing** – when the predicted disturbance may occur (ex: at critical life stages)
- **Reversibility** – time the environmental component will take to recover after the source of the effect ceases

Based on the available information on the project and the environment, the assessment of environmental effects outlined in this environmental assessment report, and the application of proposed mitigation measures and the conduct of required follow-up, the proposed boat launch will not likely result in any significant residual adverse environmental effects.

## 6.0 FOLLOW-UP ACTIVITIES

Follow-up is defined under the *Canadian Environmental Assessment Act* as a program to verify the accuracy of the environmental assessment of a project and determine the effectiveness of measures taken to mitigate the adverse environmental effects of the project. Follow-up activities include monitoring, surveillance, inspection, and may include data collection, analysis, evaluation, and reporting. Monitoring of implementation of the standard mitigation measures identified for environmental effects determined in Section 4.0 to be adverse (minor, moderate or major) are described in the following sections.

### 6.1 SOILS

Follow-up proposed during construction includes periodic inspections of equipment and storage containers for leaks, spills and releases, periodic observation for potential soil contamination, and adherence to contract specifications.

### 6.2 SURFACE WATER

Follow-up proposed includes periodic inspection for leaks, spills and releases during construction, as per Section 6.1 above. Periodic inspections will also occur for erosion, with erosion and sediment control measures implemented as required.

### 6.3 BIRDS

Follow-up proposed include monitoring to ensure that construction activities remain restricted to designated and previously disturbed areas as much as possible, ensuring that tree clearing occurs outside of the critical nesting and rearing period in accordance with *Migratory Birds Convention Act*, reporting sightings of rare species, and ensuring that reclaimed sites are appropriately revegetated.

## **6.4 FISH AND AQUATIC HABITAT**

Follow-up proposed includes periodic inspection for leaks, spills and releases during construction, as per Section 6.1 above. Periodic inspections will also occur for erosion, with erosion and sediment control measures implemented as required. Through discussion with DFO it will be determined if additional monitoring is required to assess the effectiveness of any offsetting measures implemented.

## **6.5 PUBLIC AND WORKER SAFETY**

Follow-up proposed includes recording any occurrence of workplace accidents, confirming compliance with provincial fuel storage and dispensing regulations and updating training and safety guidelines as required.

## **7.0 STATEMENT OF LIMITATIONS**

### **7.1 THIRD PARTY USE OF REPORT**

This report has been prepared for the Rural Municipality of Alexander to whom this report has been addressed and any use a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. KGS Group accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions undertaken based on this report.

### **7.2 ENVIRONMENTAL STATEMENT OF LIMITATIONS**

KGS Group prepared the environmental conclusions and recommendations for this report in a professional manner using the degree of skill and care exercised for similar projects under similar conditions by reputable and competent environmental consultants. The information contained in this report is based on the information that was made available to KGS Group during the investigation and upon the services described, which were performed within the time and budgetary requirements of the Rural Municipality of Alexander. As the report is based on the available information, some of its conclusions could be different if the information upon which it is based is determined to be false, inaccurate or contradicted by additional information. KGS Group makes no representation concerning the legal significance of its findings or the value of the property investigated.

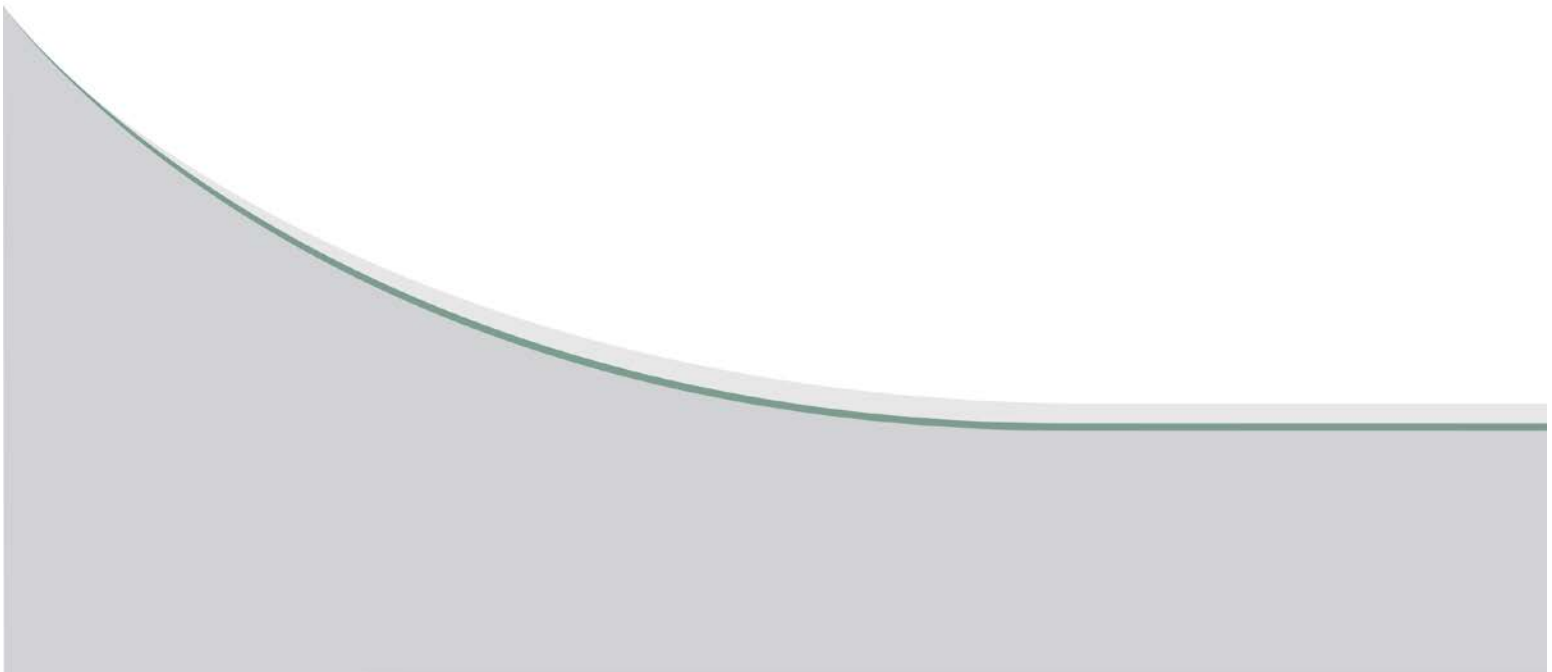
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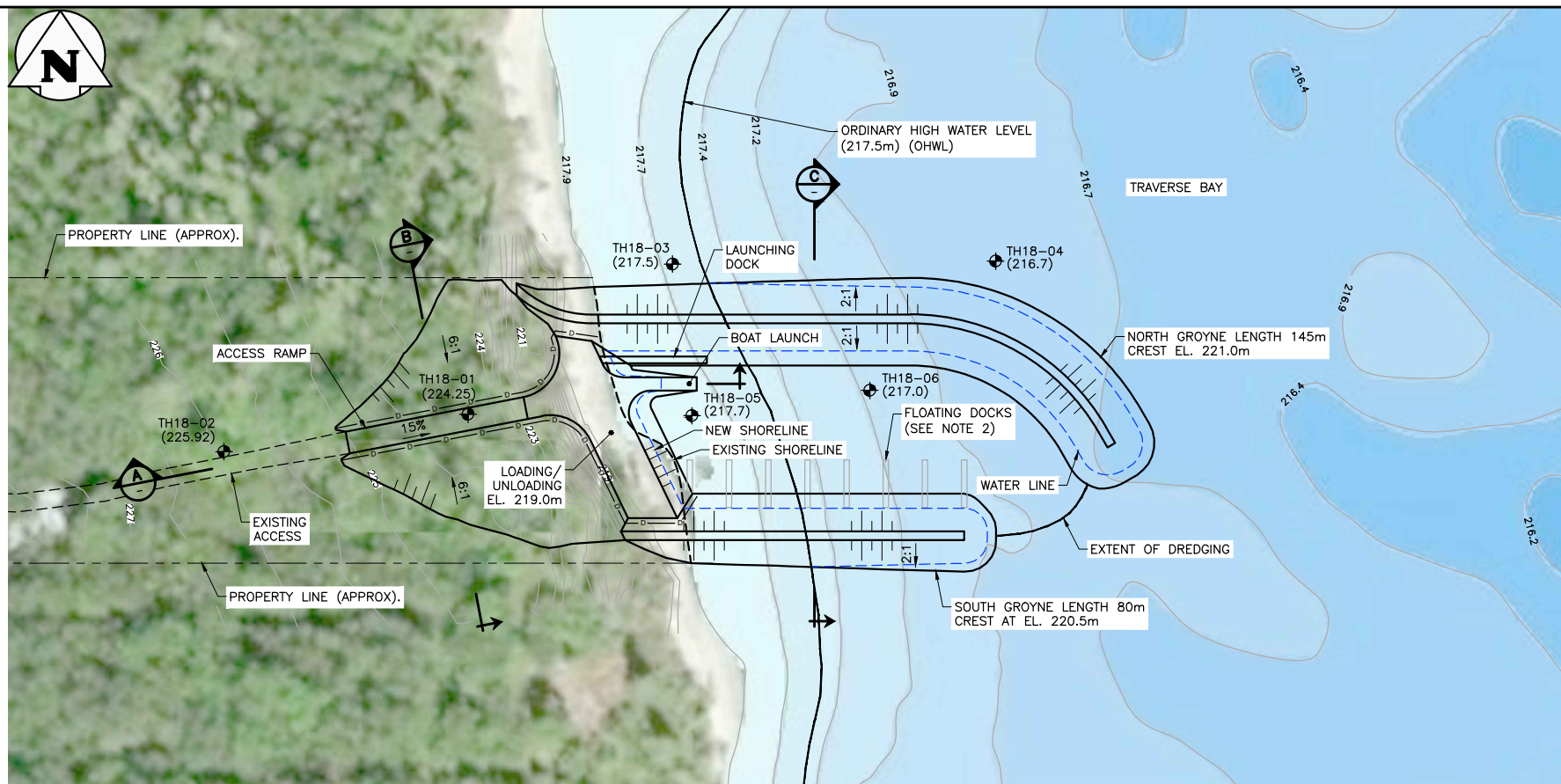
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**FIGURE**



File name: U:\VMS\17-1274-003\17-1274-003\_FIGURE 01 Rev1 - Tab:FIG 01 Plotted By: tomwnt 18/05/18 [Fr 10:58am] 11"x17" PLOT SCALE: 1"=2'



**BOAT LAUNCH PLAN**  
SCALE: 1:1500 (11"x17")

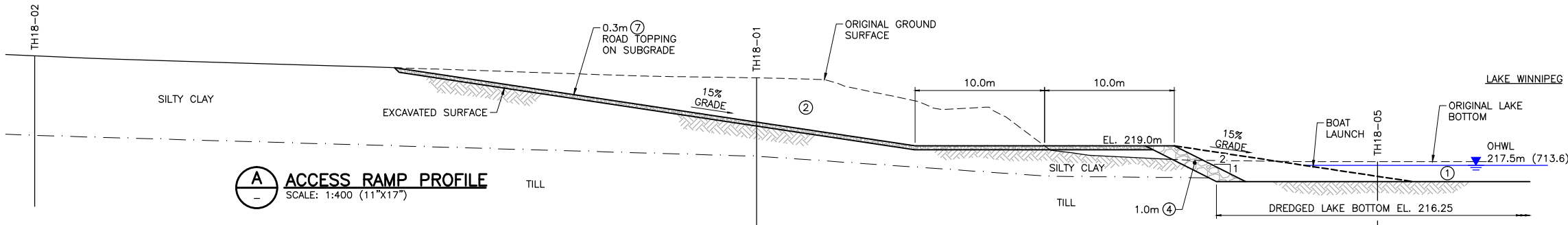


**LOCATION PLAN**  
SCALE: 1:10000 (11"x17")

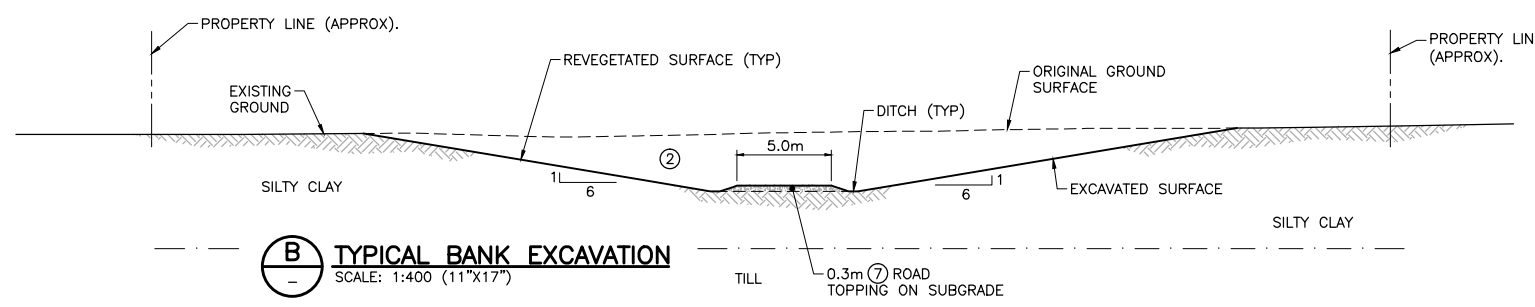


- KEY MAP**
- LEGEND:**
- ① DREDGED MATERIAL
  - ② COMMON EXCAVATION
  - ③ GRANULAR SURFACING
  - ④ ROCKFILL RIPRAP TYPE 1 (D<sub>50</sub> = 0.3m)
  - ⑤ ROCKFILL RIPRAP TYPE 2 (D<sub>50</sub> = 0.7m)
  - ⑥ ROCKFILL RIPRAP TYPE 3 (D<sub>50</sub> = 1.0m)
  - ⑦ ROAD SURFACING 0.3m THICK
  - ◆ TEST HOLE (KGS GROUP JAN. 2018)
  - ◆ TH18-06 HOLE NUMBER (216.7)
  - GROUND ELEVATION

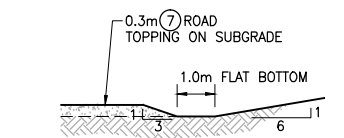
- WATER LEVELS:**
- 1:200 YEAR WATER LEVEL (INCLUDES WIND SETUP) = 219.7m
  - 1:25 YEAR WATER LEVEL (INCLUDES WIND SETUP) = 219.4m
  - TOP OF OPERATING RANGE = 217.9m
  - ORDINARY HIGH WATER LEVEL OHWL (1976 TO PRESENT) = 217.5m
  - BOTTOM OF OPERATING RANGE = 216.7m



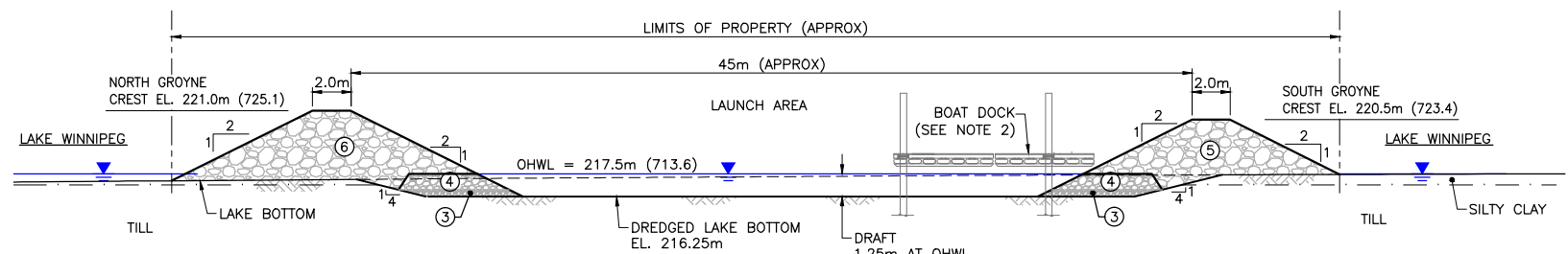
**A ACCESS RAMP PROFILE**  
SCALE: 1:400 (11"x17")



**B TYPICAL BANK EXCAVATION**  
SCALE: 1:400 (11"x17")



**1 TYPICAL DITCH DETAIL**  
SCALE: 1:200 (11"x17")



**C TYPICAL GROIN SECTION**  
SCALE: 1:400 (11"x17")

QUANTITIES	
MATERIAL	VOLUME m <sup>3</sup>
①	4000
②	3800
③	500
④	1250
⑤	1900
⑥	5000
⑦	240

- NOTE:**
1. THIS DRAWING IS FOR CONCEPTUAL PURPOSES AND PLANNING ONLY.
  2. THE FLOATING DOCKS ILLUSTRATED ARE NOT PART OF THIS PHASE OF THE DESIGN WORK AND ARE SHOWN ONLY TO PROVIDE A CONCEPTUAL VIEW FOR PLANNING PURPOSES.

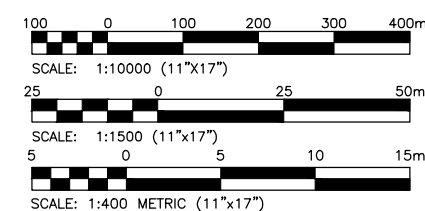
**PRELIMINARY**  
NOT TO BE USED FOR CONSTRUCTION

NO.	YY/MM/DD	DESCRIPTION	ISSUED BY	CHECK BY
1	18/05/16	REVISED OHWL 217.5m	js	RMD
0	18/03/20	ISSUED FOR INFORMATION	js	RMD

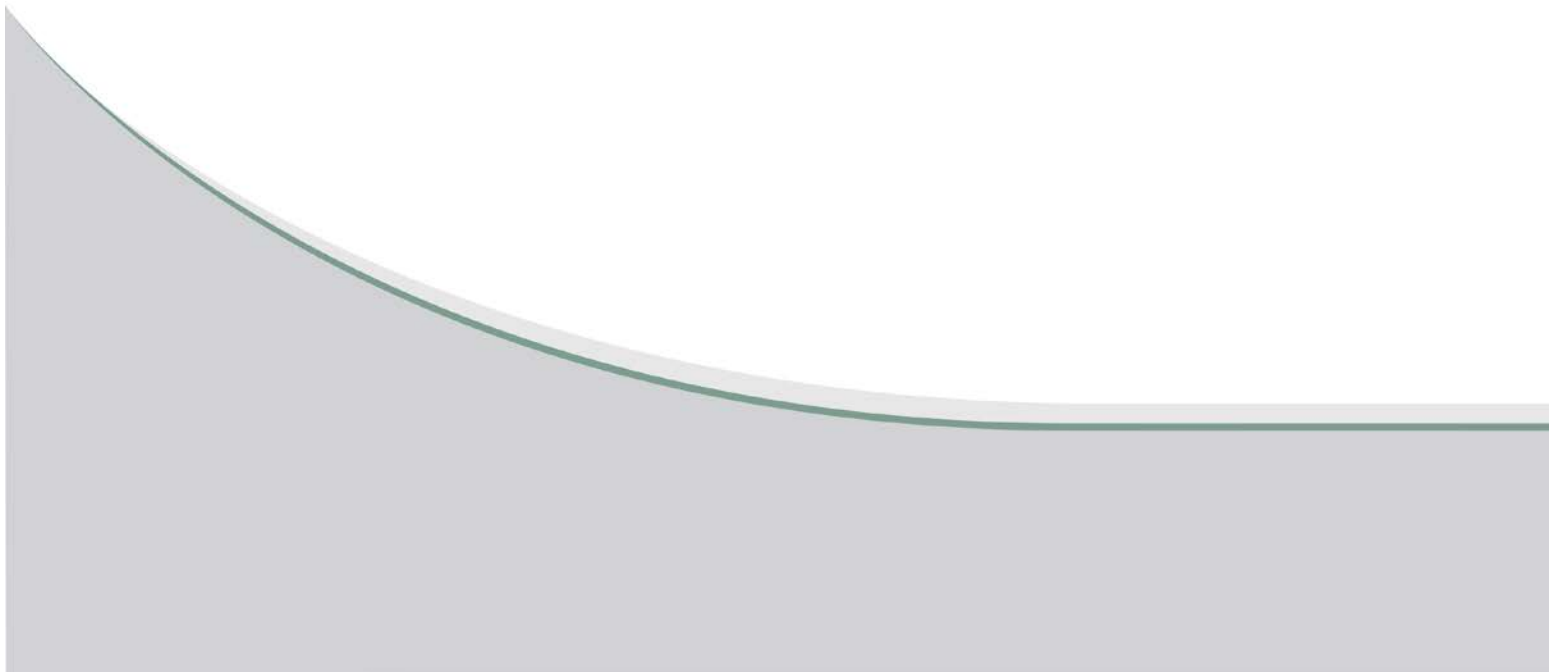
**REVISIONS / ISSUE**

**KGS GROUP**  
CONSULTING ENGINEERS

**RM OF ALEXANDER**



**APPENDIX A**  
**SITE PHOTOGRAPHS**





**Photo 1 – Forested land and shoreline conditions at proposed boat launch site (looking northwest).**



**Photo 2 – Parking lot (foreground) and access road to boat launch constructed by RM of Alexander (looking west).**

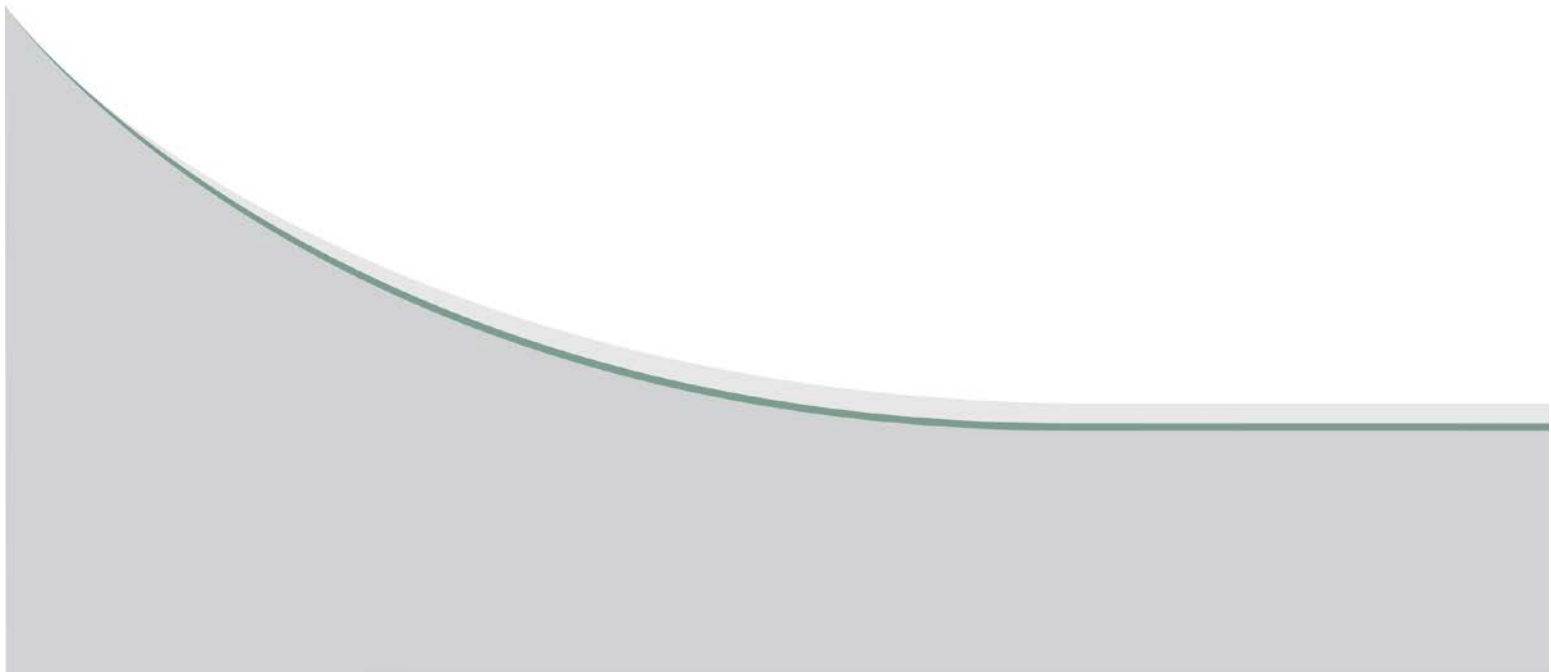


**Photo 3 – Intersection of access road with Traverse Bay Road N, west of boat launch (looking west).**



**Photo 4 – Forested land and residences/cabins along Traverse Bay Road E, north of site (looking northwest).**

**APPENDIX B**  
**STATUS OF TITLE**



## STATUS OF TITLE

Title Number **2916639/1**  
Title Status **Accepted**  
Client File **113452-0067**

## The Property Registry

A Service Provider for the Province of Manitoba



### 1. REGISTERED OWNERS, TENANCY AND LAND DESCRIPTION

RURAL MUNICIPALITY OF ALEXANDER

IS REGISTERED OWNER SUBJECT TO SUCH ENTRIES RECORDED HEREON  
IN THE FOLLOWING DESCRIBED LAND

SP LOT 2 PLAN 19436 WLTO  
SUBJECT TO THE RESERVATIONS AND PROVISOS CONTAINED IN THE GRANT FROM  
THE CROWN  
IN FRAC W 1/2 OF SECTION 30-19-8 EPM

The land in this title is, unless the contrary is expressly declared, deemed to be subject to the reservations and restrictions set out in section 58 of *The Real Property Act*.

### 2. ACTIVE INSTRUMENTS

No active instruments

### 3. ADDRESSES FOR SERVICE

RURAL MUNICIPALITY OF  
ALEXANDER  
BOX 100  
ST. GEORGES MB  
ROE 1V0

### 4. TITLE NOTES

No title notes

### 5. LAND TITLES DISTRICT

Winnipeg

### 6. DUPLICATE TITLE INFORMATION

Duplicate not produced

### 7. FROM TITLE NUMBERS

2371984/1      All

### 8. REAL PROPERTY APPLICATION / CROWN GRANT NUMBERS

No real property application or grant information

**9. ORIGINATING INSTRUMENTS**

**Instrument Type: Transfer Of Land**  
**Registration Number: 4881817/1**

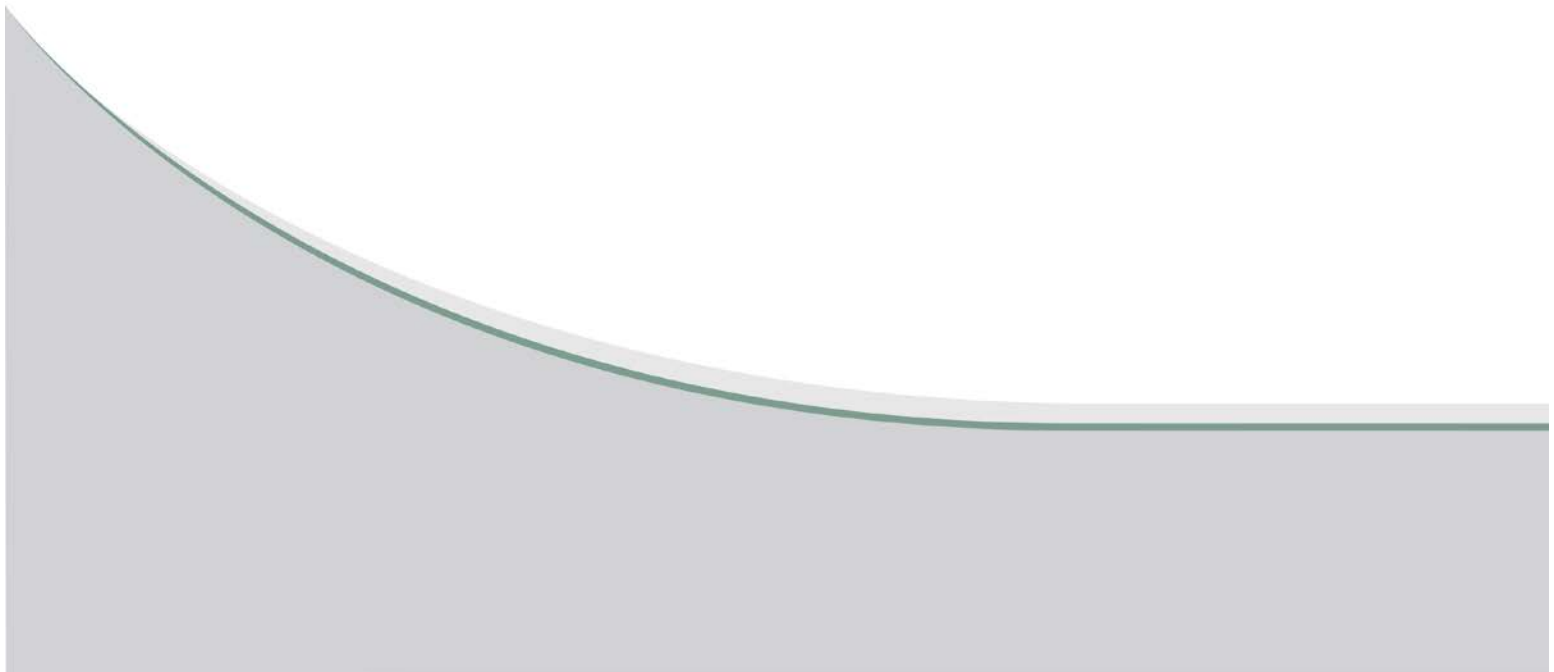
**Registration Date: 2017-09-06**  
**From/By: MYRON TRONIAK AND MICHAEL PINTEA**  
**To: RURAL MUNICIPALITY OF ALEXANDER**  
**Consideration: \$120,000.00**

**10. LAND INDEX**

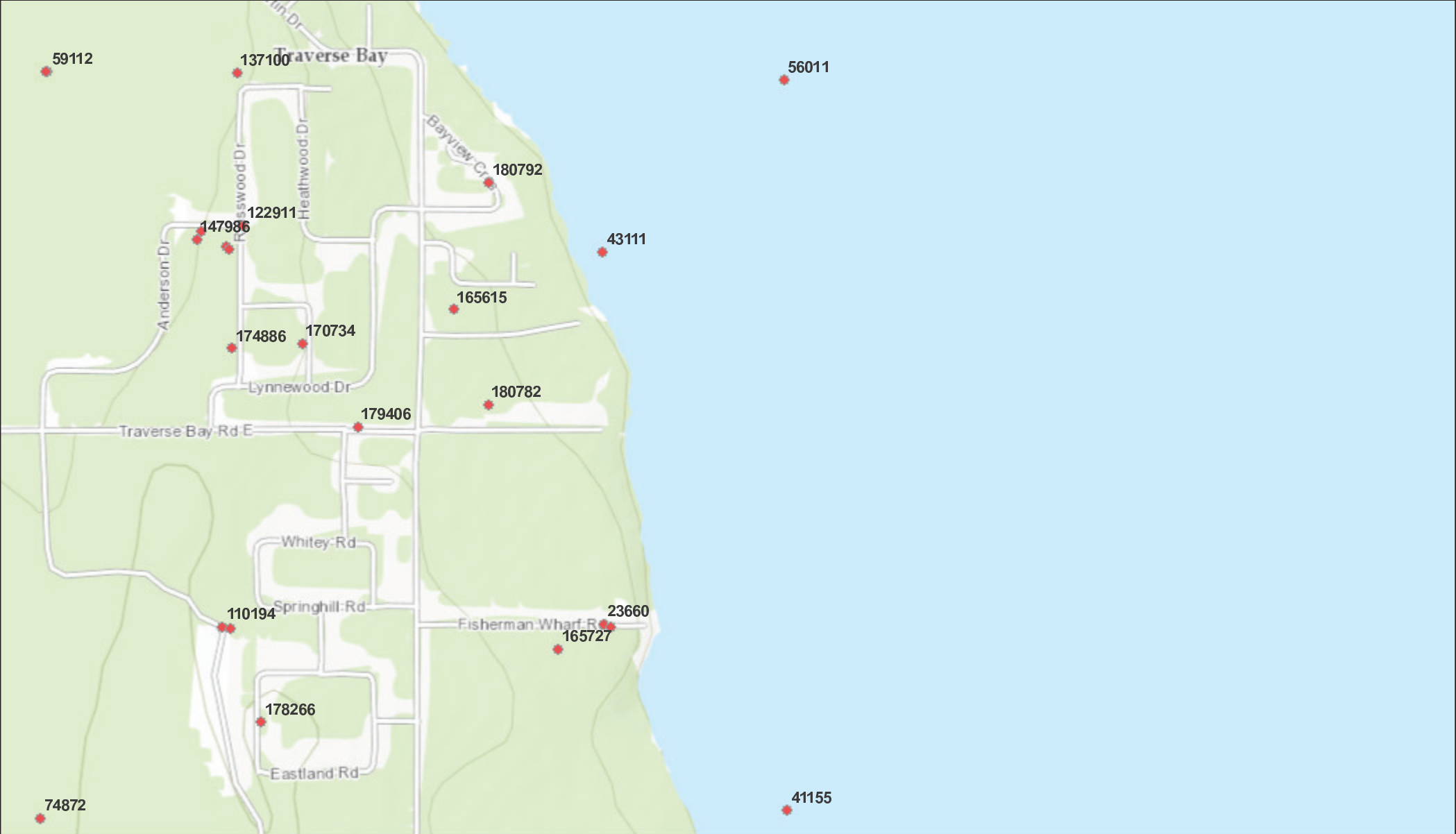
**Lot 2 Plan 19436**  
**EX RES**

**CERTIFIED TRUE EXTRACT PRODUCED FROM THE LAND TITLES DATA STORAGE  
SYSTEM OF TITLE NUMBER 2916639/1**

**APPENDIX C**  
**GW DRILL LOGS**



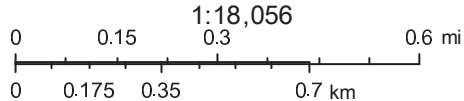
# GW Drill Well Locations



November 8, 2017

**GW Drill**

- PRODUCTION
- TEST WELL



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Location: SW31-19-8E

Well\_PID: **180782**

Owner: JON SCHELLENBERG

Driller: Echo Drilling Ltd.

Well Name:

Well Use: PRODUCTION

Water Use: Domestic

UTMX: 677962.023

UTMY: 5615740.283

Accuracy XY: 1 EXACT [<5M] [GPS]

UTMZ: 227

Accuracy Z: 4 FAIR - Shuttle at Centroid

Date Completed: 2013 Oct 15

#### WELL LOG

From (ft.)	To (ft.)	Log
0	5.0	SAND
5.0	110.0	CLAY
110.0	114.0	FINE SILTY SAND
114.0	500.0	GRANITE BEDROCK

#### WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	118.0	CASING		5.50		INSERT	PVC
118.0	500.0	OPEN HOLE			4.80		
10.0	100.0	CASING GROUT					BENTONITE

Top of Casing: 2.000 ft. above ground

#### PUMPING TEST

Date: 2013 Oct 15

Pumping Rate: 2.995 Imp. gallons/minute

Water level before pumping: 3.0 ft. below ground

Pumping level at end of test: 180.0 ft. below ground

Test duration: 1 hours, minutes

Water temperature: ?? degrees F

#### REMARKS

40020 TRAVERSE BAY ROAD EAST, WEST OF HOUSE

Location: SW-31-19-8E

Well\_PID: **43111**

Owner: ARTESIAN WATER LTD

Driller: Paul Slusarchuk Well Drilling LTd.

Well Name: HOLE 1

Well Use: TEST WELL

Water Use:

UTMX: 678200.126

UTMY: 5616081.69

Accuracy XY: UNKNOWN

UTMZ:

Accuracy Z:

Date Completed: 1981 Mar 17

#### WELL LOG

From (ft.)	To (ft.)	Log
0	7.0	CLAY
7.0	50.0	TILL
50.0	51.0	LAYER SILTY SAND
51.0	58.0	TILL
58.0	59.0	LAYER SILTY SAND
59.0	72.0	TILL
72.0	73.0	LAYER SILTY SAND
73.0	90.9	TILL
90.9	100.9	SOFT CLAY
100.9	103.9	GRANITE

#### WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	21.5	casing	6.00			T & C	BLACK IRON
21.5	91.4	casing		4.50		INSERT	GALVANIZED
91.4	103.4	perforations		4.50	0.015	WIRE WOUND	S. S.
86.9	103.9	gravel pack					

Top of Casing: 2.000 ft. below ground

#### PUMPING TEST

Date: 1981 Mar 24

Pumping Rate: 1.003 Imp. gallons/minute

Water level before pumping: 0 ft. below ground

Pumping level at end of test: ?? ft. below ground

Test duration: 1 hours, 30 minutes

Water temperature: ?? degrees F

Location: SW31-19-8E  
Well\_PID: **179406**  
Owner: GERALD HIENRICHS  
Driller: Maple Leaf Enterprises LTd.  
Well Name: 146  
Well Use: PRODUCTION  
Water Use: Domestic  
UTMX: 677678  
UTMY: 5615681  
Accuracy XY: 1 EXACT [<5M] [GPS]  
UTMZ: 227  
Accuracy Z: 4 FAIR - Shuttle at Centroid  
Date Completed: 2013 Oct 09

#### WELL LOG

From (ft.)	To (ft.)	Log
0	1.0	FILL
1.0	9.0	FINE SAND AND SILT
9.0	20.0	CLAY
20.0	43.0	MEDIUM GREY SANDY CLAY
43.0	49.0	GRAVELLY TILL
49.0	79.0	GREY CLAY TILL WITH RUBBERY LAYERS
79.0	90.0	SOFT TILL
90.0	118.0	STICKY RUBBERY TILL
118.0	142.0	SILTY TILL
142.0	145.0	GRAVELLY
145.0	146.0	GRANITE

#### WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	140.0	CASING	5.00			INSERT	PVC
140.0	145.0	PERFORATIONS		4.00			WIRE WOUND STAINLESS STEEL
130.0	145.0	GRAVEL PACK				NO. 20-40	SILICA S.
10.0	60.0	CASING GROUT					CEMENT/BENTONITE

Top of Casing: 1.000 ft. above ground

#### PUMPING TEST

Date:  
Pumping Rate: 0.501 Imp. gallons/minute  
Water level before pumping: 13.0 ft. below ground  
Pumping level at end of test: 80.0 ft. below ground  
Test duration: 12 hours, minutes  
Water temperature: ?? degrees F

REMARKS: 39 LYNWOOD, TRAVERSE BAY

Location: NW30-19-8E

Well\_PID: **165727**

Owner: STAN MIKE

Driller: Perimeter Drilling Ltd.

Well Name:

Well Use: PRODUCTION

Water Use:

UTMX: 678134

UTMY: 5615212

Accuracy XY: 1 EXACT [<5M] [GPS]

UTMZ: 228

Accuracy Z: 4 FAIR - Shuttle at Centroid

Date Completed: 2010 Aug 17

#### WELL LOG

From (ft.)	To (ft.)	Log
0	100.0	GREY CLAY
100.0	118.0	TILL
118.0	144.0	GRANITE

#### WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	120.0	CASING	5.00			INSERT	PVC
0	144.0	OPEN HOLE	4.80				
		CASING GROUT					

Top of Casing: 2.000 ft. above ground

#### PUMPING TEST

Date: 2010 Aug 17

Pumping Rate: 40.000 Imp. gallons/minute

Water level before pumping: 6.0 ft. below ground

Pumping level at end of test: 25.0 ft. below ground

Test duration: ??? hours, ?? minutes

Water temperature: ?? degrees F

#### REMARKS

TRAVERSE BAY 112-113. WELL IS NEAR NW CORNER OF HOUSE.

Location: NW-30-19-8E

Well\_PID: **23660**

Owner: TRAVERSE BAY COOP

Driller: M & M Drilling Rivers Ltd.

Well Name: TH.2

Well Use: TEST WELL

Water Use:

UTMX: 678229.941

UTMY: 5615271.07

Accuracy XY: UNKNOWN

UTMZ:

Accuracy Z:

Date Completed: 1975 May 14

#### WELL LOG

From (ft.)	To (ft.)	Log
0	21.0	SAND; FINE TO MEDIUM
21.0	24.0	CLAY; DARK GREY
24.0	26.0	CLAY; LIGHT GREY

#### WELL CONSTRUCTION

From (ft.)	To (ft.)	Casing Type	Inside Dia.(in)	Outside Dia.(in)	Slot Size(in)	Type	Material
0	5.0	casing		2.00			
5.0	21.0	perforations		2.00			

Top of Casing: 0 ft. below ground

#### PUMPING TEST

Date:

Pumping Rate: 5.000 Imp. gallons/minute

Water level before pumping: 9.0 ft. below ground

Pumping level at end of test: 19.0 ft. below ground

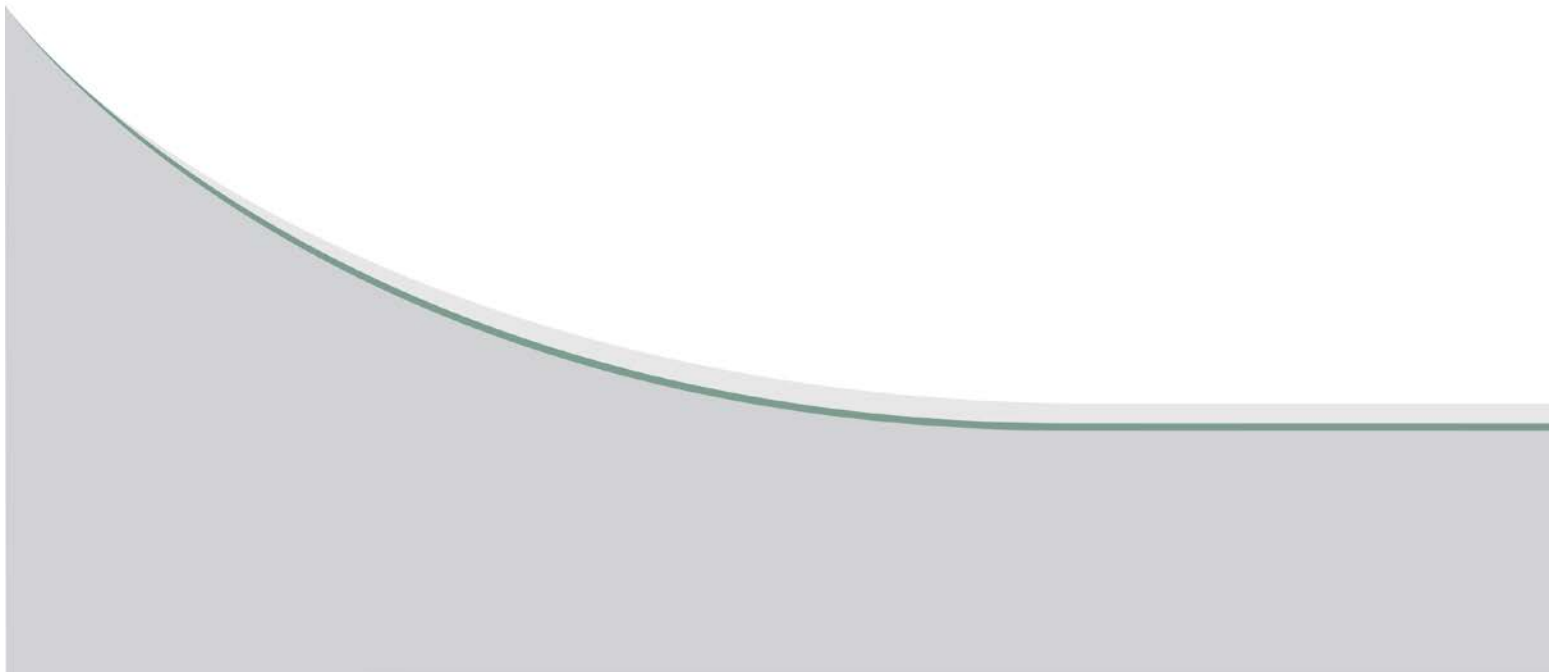
Test duration: hours, 45 minutes

Water temperature: ?? degrees F

#### REMARKS

COMM.WELL PROGRAM,800FT.W.OF DOCK,S.SIDE RD. COMMUNITY WELL  
PROGRAM,800FT.E.OF FISH SHED + S.SIDE RD.,EC=410MM,  
NACL=12MG/L,HARD=14GPG,FE=0.8MG/L

**APPENDIX D**  
**SPECIES OF CONSERVTION CONCERN**






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- [Coastal Hudson Bay Lowland](#)
- [Hayes River Upland](#)
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- [Kazan River Upland](#)
- [Lac Seul Upland](#)
- [Lake of the Woods](#)**
- [Lake Manitoba Plain](#)
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## Occurrence of Species by Ecoregion Lake of the Woods

Updated December 1, 2016

Category	Scientific Name	Common Name	Rank
Amphibian	<i>Ambystoma laterale</i>	Blue-spotted Salamander	S3S4
Amphibian	<i>Ambystoma tigrinum</i>	Eastern Tiger Salamander	S2?
Amphibian	<i>Lithobates pipiens</i>	Northern Leopard Frog	S4
Amphibian	<i>Lithobates septentrionalis</i>	Mink Frog	S3
Animal Assemblage	Gull Colony		SNR
Animal Assemblage	Snake Hibernaculum	Snake Hibernaculum	SNR
Animal Assemblage	Tern Colony		SNR
Bird	<i>Accipiter cooperii</i>	Cooper's Hawk	S4B
Bird	<i>Aechmophorus occidentalis</i>	Western Grebe	S4B
Bird	<i>Ammodramus bairdii</i>	Baird's Sparrow	S1B
Bird	<i>Ammodramus savannarum</i>	Grasshopper Sparrow	S3B
Bird	<i>Antrostomus vociferus</i>	Whip-poor-will	S3B
Bird	<i>Ardea herodias</i>	Great Blue Heron	S5B
Bird	<i>Asio flammeus</i>	Short-eared Owl	S2S3B
Bird	<i>Cardellina canadensis</i>	Canada Warbler	S3B
Bird	<i>Chaetura pelagica</i>	Chimney Swift	S2B
Bird	<i>Charadrius melodus</i>	Piping Plover	S1B
Bird	<i>Chordeiles minor</i>	Common Nighthawk	S3B
Bird	<i>Contopus cooperi</i>	Olive-sided Flycatcher	S3B
Bird	<i>Contopus virens</i>	Eastern Wood-pewee	S4B
Bird	<i>Coturnicops noveboracensis</i>	Yellow Rail	S3B
Bird	<i>Cygnus buccinator</i>	Trumpeter Swan	S1B
Bird	<i>Dolichonyx oryzivorus</i>	Bobolink	S4B
Bird	<i>Hirundo rustica</i>	Barn Swallow	S4B
Bird	<i>Ixobrychus exilis</i>	Least Bittern	S2B
Bird	<i>Larus argentatus</i>	Herring Gull	S4B
Bird	<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	S3B
Bird	<i>Phalacrocorax auritus</i>	Double-crested Cormorant	S5B
Bird	<i>Riparia riparia</i>	Bank Swallow	S5B
Bird	<i>Setophaga americana</i>	Northern Parula	S4B
Bird	<i>Setophaga pinus</i>	Pine Warbler	S3B
Bird	<i>Sterna hirundo</i>	Common Tern	S5B
Bird	<i>Strix nebulosa</i>	Great Gray Owl	S4
Bird	<i>Strix varia</i>	Barred Owl	S4
Bird	<i>Vermivora chrysoptera</i>	Golden-winged Warbler	S3B
Fish	<i>Coregonus zenithicus</i>	Shortjaw Cisco	S2
Fish	<i>Fundulus diaphanus</i>	Banded Killifish	S2
Fish	<i>Ichthyomyzon castaneus</i>	Chestnut Lamprey	SU
Fish	<i>Ichthyomyzon fossor</i>	Northern Brook Lamprey	SU

Fish	<i>Ichthyomyzon unicuspis</i>	Silver Lamprey	SU
Fish	<i>Myoxocephalus thompsoni</i>	Deepwater Sculpin	S3S4
Fish	<i>Notropis percobromus</i>	Carmine Shiner	S2
Invertebrate	<i>Amblema plicata</i>	Threeridge	S3
Invertebrate	<i>Erynnis lucilius</i>	Columbine Dusky Wing	S3
Invertebrate	<i>Erynnis martialis</i>	Mottled Dusky Wing	S1
Invertebrate	<i>Euphydryas phaeton</i>	Baltimore	S2
Invertebrate	<i>Fusconaia flava</i>	Wabash Pigtoe	S3
Invertebrate	<i>Lasmigona complanata</i>	White Heelsplitter	S3
Invertebrate	<i>Lasmigona costata</i>	Flutedshell	S2
Invertebrate	<i>Ligumia recta</i>	Black Sandshell	S3
Invertebrate	<i>Strophitus undulatus</i>	Creeper	S5
Mammal	<i>Condylura cristata</i>	Star-nosed Mole	S3
Other	<i>Leptogium rivulare</i>	Flooded Jellyskin Lichen	S1
Plant	<i>Adlumia fungosa</i>	Climbing Fumitory	SH
Plant	<i>Agalinis tenuifolia</i>	Narrow-leaved Agalinis	S2S3
Plant	<i>Amorpha fruticosa</i>	False Indigo	S1S2
Plant	<i>Anemone americana</i>	Liverleaf	S1
Plant	<i>Antennaria plantaginifolia</i>	Plantain-leaved Everlasting	S1S2
Plant	<i>Arethusa bulbosa</i>	Dragon's-mouth	S2
Plant	<i>Arisaema triphyllum</i> ssp. <i>triphyllum</i>	Jack-in-the-pulpit	S1S2
Plant	<i>Asarum canadense</i>	Wild Ginger	S3S4
Plant	<i>Bidens beckii</i>	Water-marigold	S3
Plant	<i>Botrychium simplex</i>	Least Grapefern	S1
Plant	<i>Brasenia schreberi</i>	Water-shield	S1S2
Plant	<i>Bromus porteri</i>	Porter's Chess	S2S3
Plant	<i>Calopogon tuberosus</i>	Swamp-pink	S2
Plant	<i>Calystegia spithamea</i>	Low Bindweed	SH
Plant	<i>Canadanthus modestus</i>	Large Northern Aster	S2
Plant	<i>Carex arctata</i>	Black Sedge	S1
Plant	<i>Carex castanea</i>	Chestnut Sedge	S2S3
Plant	<i>Carex crinita</i>	Long-haired Sedge	S1
Plant	<i>Carex douglasii</i>	Douglas Sedge	S2
Plant	<i>Carex emoryi</i>	Emory's Sedge	S2?
Plant	<i>Carex gracillima</i>	Slender Sedge	S2S3
Plant	<i>Carex intumescens</i>	Swollen Sedge	S3
Plant	<i>Carex livida</i>	Livid Sedge	S3
Plant	<i>Carex merritt-fernaldii</i>	Merritt Fernald's Sedge	S1
Plant	<i>Carex pauciflora</i>	Few-flowered Sedge	S3
Plant	<i>Carex pedunculata</i>	Stalked Sedge	S3
Plant	<i>Carex prairea</i>	Prairie Sedge	S3S4
Plant	<i>Carex projecta</i>	Necklace Sedge	S3?
Plant	<i>Carex tetanica</i>	Rigid Sedge	S3
Plant	<i>Carex vulpinoidea</i>	Fox Sedge	S3
Plant	<i>Caulophyllum thalictroides</i>	Papoose-root	S2
Plant	<i>Ceanothus herbaceus</i>	New Jersey Tea	S2S3
Plant	<i>Chelone glabra</i>	Turtlehead	S2
Plant	<i>Circaea canadensis</i> ssp. <i>canadensis</i>	Large Enchanter's-nightshade	S2
Plant	<i>Cladium mariscoides</i>	Twig Rush	S2S3
Plant	<i>Collinsia parviflora</i>	Blue-eyed Mary	S1
Plant	<i>Corispermum americanum</i> var. <i>americanum</i>	American Bugseed	S3
Plant	<i>Corispermum villosum</i>	Hairy Bugseed	S1S2
Plant	<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	S3
Plant	<i>Cyperus houghtonii</i>	Houghton's Umbrella-sedge	S2S3
Plant	<i>Cypripedium arietinum</i>	Ram's Head Lady's-slipper	S2S3
Plant	<i>Dicentra cucullaria</i>	Dutchman's-breeches	S1
Plant	<i>Diphasiastrum tristachyum</i>	Ground-cedar	S3
Plant	<i>Drosera linearis</i>	Slender-leaved Sundew	S2?
Plant	<i>Dryopteris fragrans</i>	Fragrant Shield Fern	S3S4
Plant	<i>Dulichium arundinaceum</i>	Three-way Sedge	S2

Plant	<i>Eleocharis obtusa</i>	Blunt Spike-rush	S1
Plant	<i>Elymus hystrix</i>	Bottle-brush Grass	S2
Plant	<i>Epigaea repens</i>	Mayflower	S3
Plant	<i>Eriocaulon aquaticum</i>	White-buttons	S1
Plant	<i>Eriophorum scheuchzeri</i>	Scheuchzeri's Cotton-grass	S2?
Plant	<i>Eurybia macrophylla</i>	White Wood Aster	S1
Plant	<i>Fraxinus nigra</i>	Black Ash	S2S3
Plant	<i>Galium aparine</i>	Cleavers	S3
Plant	<i>Gaultheria procumbens</i>	Teaberry	S3S4
Plant	<i>Gentiana rubricaulis</i>	Closed Gentian	S3
Plant	<i>Glyceria canadensis</i>	Canada Manna Grass	S1
Plant	<i>Goodyera tessellata</i>	Tesselated Rattlesnake Plantain	S2
Plant	<i>Helianthus nuttallii</i> ssp. <i>rydbergii</i>	Tuberous-rooted Sunflower	S2
Plant	<i>Heteranthera dubia</i>	Water Star-grass	S2S3
Plant	<i>Hudsonia tomentosa</i>	False Heather	S3
Plant	<i>Huperzia lucidula</i>	Shining Club-moss	SH
Plant	<i>Huperzia selago</i>	Mountain Club-moss	S2S3
Plant	<i>Juncus vaseyi</i>	Big-head Rush	S4
Plant	<i>Lechea intermedia</i>	Pinweed	S1?
Plant	<i>Leersia oryzoides</i>	Rice Cutgrass	S3
Plant	<i>Leucophysalis grandiflora</i>	Large White-flowered Ground-cherry	S3S4
Plant	<i>Liparis loeselii</i>	Yellow Twayblade	S3S4
Plant	<i>Lycopodium clavatum</i>	Running-pine	S3S4
Plant	<i>Maianthemum racemosum</i> ssp. <i>racemosum</i>	False Spikenard	S1
Plant	<i>Malaxis monophyllos</i>	White Adder's-mouth	S2?
Plant	<i>Malaxis unifolia</i>	Green Adder's-mouth	S2?
Plant	<i>Menispermum canadense</i>	Canada Moonseed	S3
Plant	<i>Micranthes pensylvanica</i>	Swamp Saxifrage	S1
Plant	<i>Myriophyllum alterniflorum</i>	Water-milfoil	S1S3
Plant	<i>Myriophyllum farwellii</i>	Farwell's Water-milfoil	S1
Plant	<i>Nymphaea odorata</i>	Fragrant Water-lily	S2?
Plant	<i>Nymphaea odorata</i> ssp. <i>odorata</i>	Fragrant Water-lily	S2
Plant	<i>Nymphaea odorata</i> ssp. <i>tuberosa</i>	Tubreous White Water-lily	S1
Plant	<i>Nymphaea tetragona</i>	Small Water-lily	S2?
Plant	<i>Onoclea sensibilis</i>	Sensitive Fern	S3?
Plant	<i>Ophioglossum pusillum</i>	Northern Adder's-tongue	S1
Plant	<i>Osmorhiza claytonii</i>	Hairy Sweet Cicely	S2?
Plant	<i>Osmunda claytoniana</i>	Interrupted Fern	S2S3
Plant	<i>Ostrya virginiana</i>	Hop-hornbeam	S2
Plant	<i>Pellaea glabella</i> ssp. <i>glabella</i>	Smooth Cliffbrake	S1?
Plant	<i>Persicaria sagittata</i>	Arrow-leaved Tear-thumb	S3
Plant	<i>Pinus resinosa</i>	Red Pine	S2S3
Plant	<i>Pinus strobus</i>	Eastern White Pine	S2
Plant	<i>Platanthera hookeri</i>	Hooker's Orchid	S2S3
Plant	<i>Platanthera lacera</i>	Fringed Orchid	S1S2
Plant	<i>Platanthera orbiculata</i>	Round-leaved Bog Orchid	S3S4
Plant	<i>Platanthera psycodes</i>	Small Purple-fringed Orchid	S1
Plant	<i>Pogonia ophioglossoides</i>	Rose Pogonia	S1
Plant	<i>Populus grandidentata</i>	Large-tooth Aspen	S1S2
Plant	<i>Potamogeton amplifolius</i>	Large-leaved Pondweed	S3
Plant	<i>Potamogeton illinoensis</i>	Illinois Pondweed	S1?
Plant	<i>Potamogeton robbinsii</i>	Robbin's Pondweed	S2S3
Plant	<i>Potamogeton spirillus</i>	Fennel-leaved Pondweed	S1
Plant	<i>Pyrola americana</i>	Round-leaved Pyrola	S2?
Plant	<i>Ranunculus fascicularis</i>	Early Buttercup	S1
Plant	<i>Ranunculus hispidus</i> var. <i>caricetorum</i>	Bristly Buttercup	S2
Plant	<i>Rhynchospora alba</i>	White Beakrush	S3
Plant	<i>Rhynchospora capillacea</i>	Horned Beakrush	S2S3
Plant	<i>Sagittaria rigida</i>	Sessile-fruited Arrowhead	S2?

Plant	<i>Sanguinaria canadensis</i>	Blood-root	S2
Plant	<i>Sceptridium multifidum</i>	Leathery Grape-fern	S3
Plant	<i>Sceptridium oneidense</i>	Blunt-lobed Moonwort	S1
Plant	<i>Scutellaria parvula</i> var. <i>missouriensis</i>	Small Skullcap	S1?
Plant	<i>Selaginella selaginoides</i>	Low Spike-moss	S3S4
Plant	<i>Sisyrinchium campestre</i>	White-eyed Grass	S3
Plant	<i>Solidago juncea</i>	Sharp-toothed Goldenrod	S1S2
Plant	<i>Solidago uliginosa</i>	Bog Goldenrod	S3
Plant	<i>Sparganium glomeratum</i>	Clustered Burreed	S1S2
Plant	<i>Spiranthes magnicamporum</i>	Great Plains Ladies'-tresses	S1S2
Plant	<i>Streptopus amplexifolius</i>	Clasping Twisted-stalk	S2?
Plant	<i>Symphyotrichum sericeum</i>	Western Silvery Aster	S2S3
Plant	<i>Taxus canadensis</i>	Canada Yew	S3
Plant	<i>Thermopsis rhombifolia</i>	Golden Bean	S2S3
Plant	<i>Torreyochloa pallida</i> var. <i>fernaldii</i>	Pale Manna Grass	S2
Plant	<i>Uvularia sessilifolia</i>	Small Bellwort	S2
Plant	<i>Vaccinium caespitosum</i>	Dwarf Bilberry	S3
Plant	<i>Viola labradorica</i>	Early Blue Violet	S3
Plant	<i>Vitis riparia</i>	Riverbank Grape	S3S4
Plant	<i>Woodsia alpina</i>	Northern Woodsia	S2
Plant	<i>Woodsia glabella</i>	Smooth Woodsia	S2
Reptile	<i>Chelydra serpentina</i>	Snapping Turtle	S3
Reptile	<i>Storeria occipitomaculata</i>	Northern Redbelly Snake	S3S4
Reptile	<i>Thamnophis sirtalis sirtalis</i>	Eastern Garter Snake	S3S4

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**APPENDIX E**  
**GOVERNMENT CORRESPONDENCE**

## Loni Andres

---

**From:** Friesen, Chris (SD) [Chris.Friesen@gov.mb.ca]  
**Sent:** Tuesday, May 15, 2018 11:48 AM  
**To:** Loni Andres  
**Subject:** RE: CDC Data Request - Traverse Bay Boat Launch

Hi Lori  
Yes, my previous response still applies. Thanks for checking.

Chris Friesen  
Coordinator  
Manitoba Conservation Data Centre  
204-945-7747  
chris.friesen@gov.mb.ca  
<http://www.manitoba.ca/sd/cdc/>

---

**From:** Loni Andres [mailto:landres@ksgsgroup.com]  
**Sent:** May-14-18 2:00 PM  
**To:** Friesen, Chris (SD) <Chris.Friesen@gov.mb.ca>  
**Subject:** RE: CDC Data Request - Traverse Bay Boat Launch

Hi Chris,  
  
This project is moving slowly. Can you please confirm that the information you provided me in November is up to date?

Regards,

Loni

**Loni Andres**  
*Geo-Environmental Scientist*



**KGS Group Consulting Engineers & Project Managers**  
3<sup>rd</sup> Flr – 865 Waverley Street  
Winnipeg, Manitoba  
R3T 5P4  
Tel: (204) 896-1209 Ext. 288  
Fax: (204) 896-0754  
Email: [landres@ksgsgroup.com](mailto:landres@ksgsgroup.com)

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---

**From:** Friesen, Chris (SD) [<mailto:Chris.Friesen@gov.mb.ca>]  
**Sent:** Monday, November 20, 2017 10:37 AM  
**To:** 'Loni Andres'  
**Subject:** RE: CDC Data Request - Traverse Bay Boat Launch

Lori

Thank you for your information request. I completed a search of the Manitoba Conservation Data Centre's rare species database and found no occurrences at this time for your area of interest.

The information provided in this letter is based on existing data known to the Manitoba Conservation Data Centre at the time of the request. These data are dependent on the research and observations of CDC staff and others who have shared their data,

and reflect our current state of knowledge. **An absence of data in any particular geographic area does not necessarily mean that species or ecological communities of concern are not present;** in many areas, comprehensive surveys have never been completed. Therefore, this information should be regarded neither as a final statement on the occurrence of any species of concern, nor as a substitute for on-site surveys for species as part of environmental assessments.

Because the Manitoba CDC's Biotics database is continually updated and because information requests are evaluated by type of action, any given response is only appropriate for its respective request. Please contact the Manitoba CDC for an update on this natural heritage information if more than six months pass before it is utilized.

Third party requests for products wholly or partially derived from Biotics must be approved by the Manitoba CDC before information is released. Once approved, the primary user will identify the Manitoba CDC as data contributors on any map or publication using Biotics data, as follows as: Data developed by the Manitoba Conservation Data Centre; Wildlife & Fisheries Branch, Manitoba Sustainable Development.

**This letter is for information purposes only - it does not constitute consent or approval of the proposed project or activity, nor does it negate the need for any permits or approvals required by the Province of Manitoba.**

We would be interested in receiving a copy of the results of any field surveys that you may undertake, to update our database with the most current knowledge of the area.

If you have any questions or require further information please contact me directly at (204) 945-7747.

Chris Friesen  
Coordinator  
Manitoba Conservation Data Centre  
204-945-7747  
[chris.friesen@gov.mb.ca](mailto:chris.friesen@gov.mb.ca)  
<http://www.manitoba.ca/sd/cdc/>

---

**From:** Loni Andres [<mailto:LAndres@kgsgroup.com>]  
**Sent:** November-07-17 1:04 PM  
**To:** Friesen, Chris (SD) <[Chris.Friesen@gov.mb.ca](mailto:Chris.Friesen@gov.mb.ca)>  
**Subject:** CDC Data Request - Traverse Bay Boat Launch

Chris:

KGS Group is performing engineering services designing and tendering a boat launch in Traverse Bay which will extend into Lake Winnipeg. We are requesting information regarding the locations of any plant, wildlife or aquatic Species at Risk occurrences on or near the project land. The information will be used to assess potential project impacts on species at risk and their habitat (if any) and to develop appropriate mitigation measures and follow-up.

The project location is shown in the pink rectangle on the attached pdf (centered at 14U 678279E, 5615586N) and is also defined in the attached shape file.

Our preference is to receive the data by email and for the data to be presented in Microsoft Excel Spreadsheet (providing the location of each occurrence).

Thanks,

**Loni Andres**  
*Geo-Environmental Scientist*



**KGS Group Consulting Engineers & Project Managers**

3<sup>rd</sup> Flr – 865 Waverley Street

Winnipeg, Manitoba

R3T 5P4

Tel: (204) 896-1209 Ext. 288

Fax: (204) 896-0754

Email: [landres@ksgsgroup.com](mailto:landres@ksgsgroup.com)

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## Loni Andres

---

**From:** McClean, Heather (SCH) [Heather.McClean@gov.mb.ca]  
**Sent:** Tuesday, November 07, 2017 2:18 PM  
**To:** 'Loni Andres'  
**Subject:** RE: Heritage Data Request - Traverse Bay Boat Launch

Hi Loni – a search of the database reveals that there are no known heritage or archaeological resources located within the study area.

Thank you.

## Heather McClean

**Heritage Resources Registrar  
Historical Assessment Services  
Historic Resources Branch  
Main Floor, 213 Notre Dame Avenue  
Winnipeg MB R3B 1N3  
[Heather.McClean@gov.mb.ca](mailto:Heather.McClean@gov.mb.ca)  
Phone: (204) 945-7146  
Fax: (204) 948-2384**

---

**From:** Loni Andres [<mailto:LAndres@kgsgroup.com>]  
**Sent:** November-07-17 1:04 PM  
**To:** McClean, Heather (SCH) <[Heather.McClean@gov.mb.ca](mailto:Heather.McClean@gov.mb.ca)>  
**Subject:** Heritage Data Request - Traverse Bay Boat Launch

Heather:

KGS Group is performing engineering services designing and tendering a boat launch in Traverse Bay which will extend into Lake Winnipeg. We are requesting a location and description of any known heritage or archaeological resources located on or near the project land. The information will be used to assess potential project impacts on heritage and archaeological resources (if any) and to develop appropriate mitigation measures and follow-up.

The project location is shown in the pink square of the attached pdf (centered at 14U 522275E, 5511562N) and is also defined in the attached shape file.

Our preference is to receive the data by email and for the data to be in Excel or ArcView format (or PDF mapsheet).

If you have any questions don't hesitate to contact me, thanks.

Cheers,

**Loni Andres**

*Geo-Environmental Scientist*



**KGS Group Consulting Engineers & Project Managers**  
3<sup>rd</sup> Flr – 865 Waverley Street  
Winnipeg, Manitoba  
R3T 5P4  
Tel: (204) 896-1209 Ext. 288  
Fax: (204) 896-0754  
Email: [landres@kgsgroup.com](mailto:landres@kgsgroup.com)

**DATE:** 2018-06-07

**TO: Gene SENIOR**  
Environmental Scientist  
865 Waverley Street  
Winnipeg, MB R3T 5P4

**FROM: Suyoko Anne TSUKAMOTO**  
**Impact Assessment Archaeologist**  
Historic Resources Branch  
Main Floor – 213 Notre Dame Avenue  
Winnipeg, Manitoba, R3B 1N3

PHONE NO: (204) 945-2118  
FAX: (204) 948-2384  
E-MAIL: [Suyoko.Tsukamoto@gov.mb.ca](mailto:Suyoko.Tsukamoto@gov.mb.ca)

**SUBJECT: Screening request – Traverse Bay Boat Launch**  
**HRB File #: AAS-18-13166**

Concerns.

Further to your e-mail regarding the above-noted heritage screening, the Historic Resources Branch has examined the location in conjunction with Branch records for areas of potential concern. The boat launch is on the lakeshore of Traverse Bay/Lake Winnipeg – an ancient waterway wherein there are several trade posts situated at the mouth of the Winnipeg River as it enters Traverse Bay, suggesting the area was well travelled and visited by Past Peoples. The development is also in the vicinity of a previously reported archaeological site. These factors suggest that any future planned development within the area has the potential to impact heritage resources, therefore, the Historic Resources Branch has concerns.

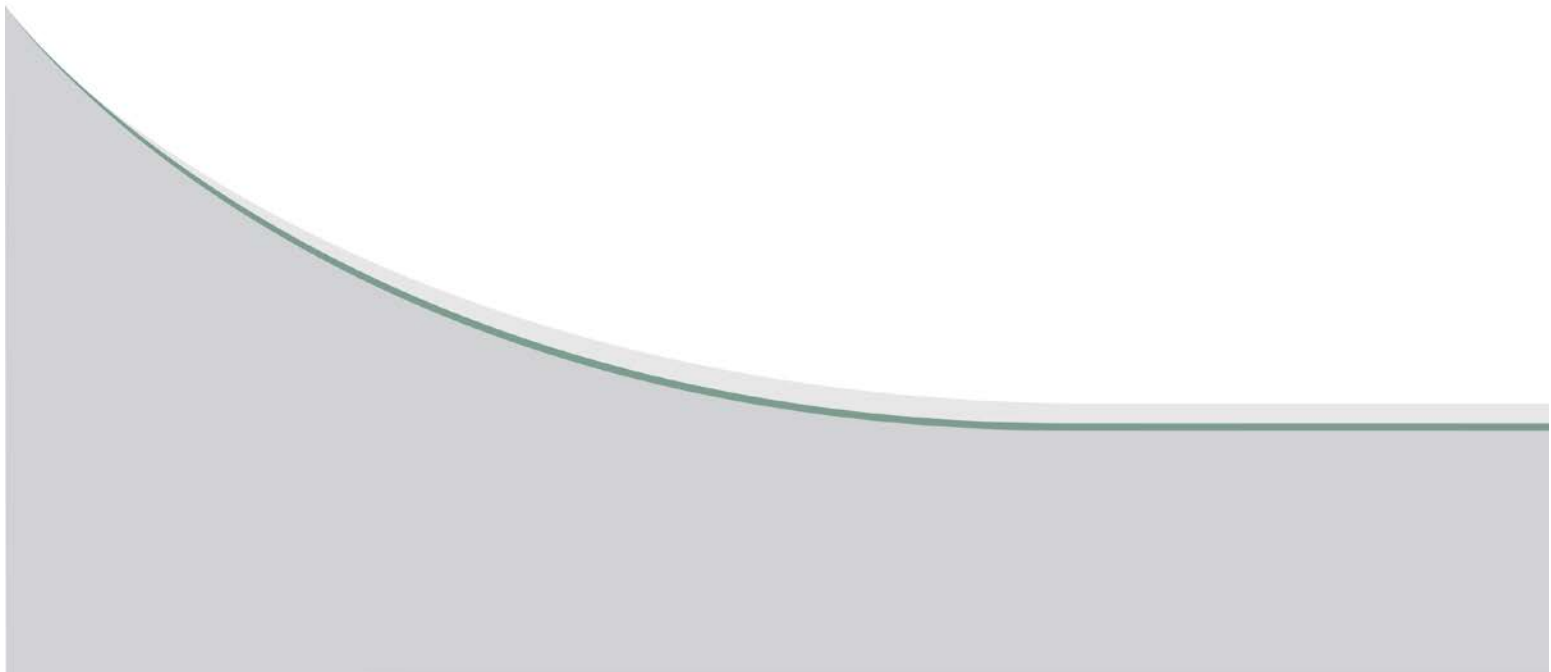
Under Section 12(2) of The Heritage Resources Act, if the Minister of Sport, Culture and Heritage has reason to believe that heritage resources or human remains are known, or thought likely to be present, on lands that are to be developed, then the owner/developer is required to conduct at his/her own expense, a heritage resource impact assessment (HRIA) and mitigation, if necessary, prior to the project's start.

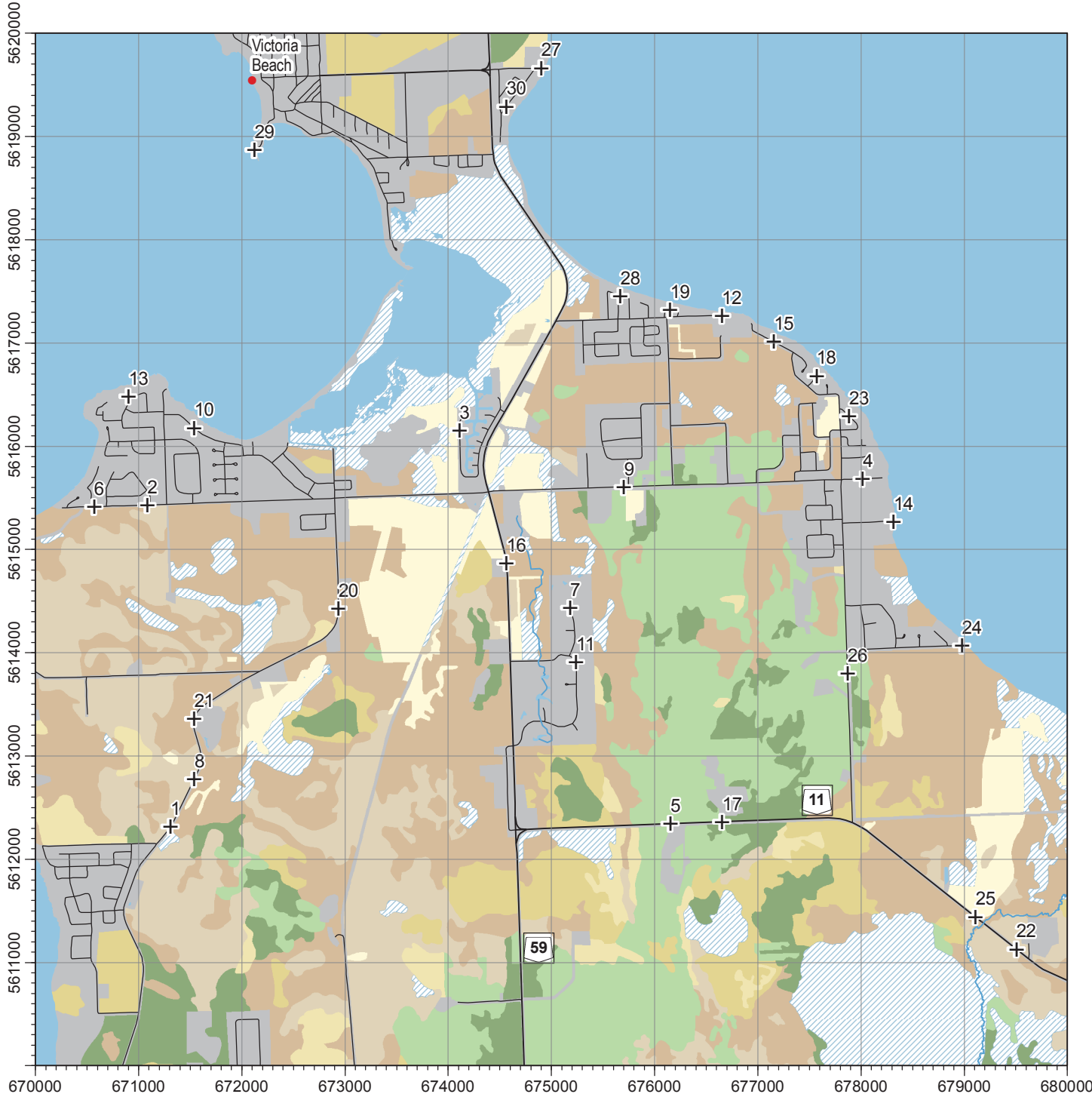
The developer must contract a qualified archaeological consultant to conduct a Heritage Resources Impact assessment (HRIA) of the proposed development location, in order to identify and assess any heritage resources that may be negatively impacted by development. If desirable, the Branch will work with the developer/land owners and its consultant to draw up terms of reference for this project.

If you have any further questions or comments, please feel free to contact the Branch as above.

Manitoba Historic Resources Branch  
Archaeological Assessment Services

**APPENDIX F**  
**MANITOBA BREEDING BIRD ATLAS**





**Predefined point count coordinates**  
**Coordonnées des points d'écoute prédéterminés**

POINT	EASTING UTM Est	NORTHING UTM Nord
1	671309	5612316
2	671083	5615433
3	674110	5616155
4	678018	5615685
5	676155	5612345
6	670570	5615415
7	675183	5614435
8	671541	5612775
9	675703	5615607
10	671541	5616178
11	675241	5613913
12	676654	5617267
13	670902	5616484
14	678317	5615273
15	677157	5617015
16	674567	5614870
17	676655	5612365
18	677571	5616683
19	676152	5617323
20	672938	5614431
21	671541	5613363
22	679507	5611131
23	677886	5616293
24	678983	5614072
25	679111	5611444
26	677870	5613798
27	674904	5619667
28	675671	5617457
29	672124	5618871
30	674567	5619293

Legend	Légende
Expressway or highway	Autoroute ou route nationale (asphaltée)
Regional or local road	Route régionale ou locale (asphaltée ou non)
Rail line	Chemin de fer
Utility corridor	Ligne de transport d'énergie
Watercourse	Rivière ou ruisseau
Mature broadleaf forest	Forêt de feuillus (mature)
Young broadleaf forest	Forêt de feuillus (jeune)
Mature coniferous forest	Forêt de conifères (mature)
Young coniferous forest	Forêt de conifères (jeune)
Mature mixed forest	Forêt mixte (mature)
Young mixed forest	Forêt mixte (jeune)
Shrubland / other	Milieu arbustif / autre
Open wetland	Milieu humide (marais)
Agriculture / open country	Milieu agricole
Urban / unclassified	Milieu urbanisé / non classifié
Water	Eau

Topographic data: © Government of Manitoba, © Natural Resources Canada  
 Données topographiques: © Gouvernement du Manitoba, © Ressources naturelles Canada

Cartographic production by Bird Studies Canada  
 Production cartographique par Études d'oiseaux Canada

Note: This map is only for use by atlas participants in the context of the project. The project partners are in no way responsible for any inaccuracies, mistakes or omissions in the information that appears on this map.

Avis : cette carte ne doit être utilisée que par les participants au projet de l'Atlas des oiseaux nicheurs du Manitoba, et uniquement dans le cadre du projet. Les responsables du projet d'atlas ne peuvent être tenus responsables de toute inexactitude, erreur ou omission concernant les informations apparaissant sur cette carte.

6° Universal Transverse Mercator (UTM) Projection; Zone 14, Central Meridian -99°; North American Datum 1983 (NAD 83)  
 Projection universelle transverse de Mercator (UTM) 6° Zone 14, méridien central -99°;  
 Système de référence géodésique nord-américain 1983 (NAD 83)





**Square Summary (14PB71)**

#species				#hours	#pc done	
poss	prob	conf	total		road	offrd
37	55	34	126	72.2	25	0

**Region summary (#5: Nopiming / Winnipeg River)**

#squares	#sq with data	#species	#pc done	target #pc
145	114	192	1548	543

**Target number of point counts in this square:** 14 road side, 1 off road (Open Wetland: 1). Please try to ensure that each off-road station is located such that the entire 100m radius circle is within the prescribed habitat.

**Approximate time allocation for general atlassing:** Young broadleaf forest: 11%, Mature broadleaf forest: 25%, Young coniferous forest: 12%, Mature coniferous forest: 5%, Young mixed forest: 2%, Mature mixed forest: 6%, Open Wetland: 10%, Agriculture / open country: 5%, Urban / unclassified: 21%. Refer to the atlas PDF maps and online resources to locate habitats.

SPECIES	Code	%	SPECIES	Code	%	SPECIES	Code	%
Canada Goose	FY	70	American White Pelican §		11	Solitary Sandpiper ‡	P	10
Trumpeter Swan †		14	Double-cr. Cormorant §	H	12	Greater Yellowlegs ‡¶		1
Wood Duck	H	34	American Bittern	T	34	Willet ‡		<1
Gadwall		3	Least Bittern †		0	Lesser Yellowlegs ‡¶		0
American Wigeon		5	Great Blue Heron §		22	Upland Sandpiper ‡		0
Mallard	T	81	Great Egret ‡¶		0	Marbled Godwit		10
Blue-winged Teal	T	25	Black-crown. N.-Heron §		0	Wilson's Snipe	M	72
Northern Shoveler	H	8	Turkey Vulture	H	71	American Woodcock	M	57
Northern Pintail		4	Osprey	NY	21	Wilson's Phalarope		1
Green-winged Teal	H	35	Bald Eagle	T	67	Bonaparte's Gull ‡		4
Canvasback ‡		0	Northern Harrier	H	41	Franklin's Gull §		0
Redhead ‡		1	Sharp-shinned Hawk	H	20	Ring-billed Gull §	H	27
Ring-necked Duck	T	43	Cooper's Hawk	T	7	Herring Gull §	H	31
Lesser Scaup	P	7	Northern Goshawk		2	Caspian Tern §		2
Bufflehead		16	Broad-winged Hawk	T	59	Black Tern §		3
Common Goldeneye	FY	55	Swainson's Hawk ‡		0	Common Tern §	P	17
Hooded Merganser	H	34	Red-tailed Hawk	H	43	Forster's Tern §	P	2
Common Merganser	P	31	American Kestrel	T	50	Rock Pigeon	P	18
Ruddy Duck ‡		<1	Merlin	AE	40	Mourning Dove		36
Gray Partridge		3	Peregrine Falcon ◻		0	Black-billed Cuckoo	S	40
Ruffed Grouse	FY	79	Yellow Rail ◻	S	7	Eastern Screech-Owl ‡		0
Spruce Grouse		12	Virginia Rail		7	Great Horned Owl		25
Sharp-tailed Grouse		16	Sora	S	28	Northern Hawk Owl ◻		16
<u>Common Loon</u>		54	American Coot		1	Barred Owl ◻	NE	29
Pied-billed Grebe	H	10	Sandhill Crane	P	57	Great Gray Owl ◻		19
Horned Grebe ◻		0	Piping Plover †		<1	Long-eared Owl ◻	P	22
Red-necked Grebe §		3	Killdeer	T	54	Short-eared Owl ◻		6
Eared Grebe ‡§		<1	American Avocet ‡		0	Boreal Owl ◻		21
Western Grebe ‡§	D	2	Spotted Sandpiper	T	47	Northern Saw-whet Owl	S	47

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## Manitoba Breeding Bird Atlas - Summary Sheet for Square 14PB71 (page 2 of 3)

SPECIES	Code	%	SPECIES	Code	%	SPECIES	Code	%
Common Nighthawk ♂	M	28	Black-billed Magpie	NY	38	European Starling		42
Whip-poor-will ♂	T	34	American Crow	NY	80	Sprague's Pipit ‡		0
Chimney Swift ♂		<1	Common Raven	NY	88	Cedar Waxwing	CF	83
Ruby-throated Hummingbird	CF	45	Horned Lark		4	Golden-winged Warbler ‡	S	7
Belted Kingfisher	H	46	Purple Martin §		11	Tennessee Warbler	T	63
Red-headed Woodpecker ♂		7	Tree Swallow	AE	58	Orange-crowned Warbler	H	13
Yellow-bellied Sapsucker	T	78	North. Rgh-wing Swallow		3	Nashville Warbler	M	92
Downy Woodpecker	D	45	Bank Swallow §	AE	14	Northern Parula ♂		42
Hairy Woodpecker	T	75	Cliff Swallow §	NY	22	Yellow Warbler	NY	83
Am. Three-toed Woodp.		10	Barn Swallow	NY	67	Chestnut-sided Warbler	T	89
Black-backed Woodpecker		24	Black-capped Chickadee	D	83	Magnolia Warbler	P	83
Northern Flicker	A	85	Boreal Chickadee		23	Cape May Warbler	P	33
Pileated Woodpecker	T	74	Red-breasted Nuthatch	CF	77	Yellow-rumped Warbler	FY	78
Olive-sided Flycatcher ♂	H	26	White-breasted Nuthatch	CF	26	Black-thr. Green Warbler	S	35
Eastern Wood-Pewee	T	30	Brown Creeper	H	36	Blackburnian Warbler	M	72
Yellow-bellied Flycatcher	H	45	House Wren	NY	37	Pine Warbler †	S	4
Alder Flycatcher	T	79	Winter Wren	S	66	Palm Warbler	P	21
Least Flycatcher	T	93	Sedge Wren	S	50	Bay-breasted Warbler		18
Eastern Phoebe	NY	70	Marsh Wren	S	14	Blackpoll Warbler ‡		0
Great Crested Flycatcher	D	36	Golden-crowned Kinglet		35	Black-and-white Warbler	CF	87
Western Kingbird	H	10	<u>Ruby-crowned Kinglet</u>		77	American Redstart	FY	73
Eastern Kingbird	T	55	Eastern Bluebird	P	28	Ovenbird	T	92
Yellow-throated Vireo ‡		4	Mountain Bluebird ‡		0	Northern Waterthrush	S	43
Blue-headed Vireo	S	58	Veery	CF	77	Connecticut Warbler		47
Warbling Vireo		18	Swainson's Thrush	D	73	Mourning Warbler	T	83
Philadelphia Vireo		18	Hermit Thrush	S	78	Common Yellowthroat	V	89
Red-eyed Vireo	NB	95	American Robin	CF	95	Wilson's Warbler		13
<u>Gray Jay</u>		65	Gray Catbird	NE	49	Canada Warbler ♂	T	31
Blue Jay	CF	83	Brown Thrasher		7	Eastern Towhee ‡		<1

[<< previous page](#) | [continuous pages](#) | [next page >>](#)

## Manitoba Breeding Bird Atlas - Summary Sheet for Square 14PB71 (page 3 of 3)

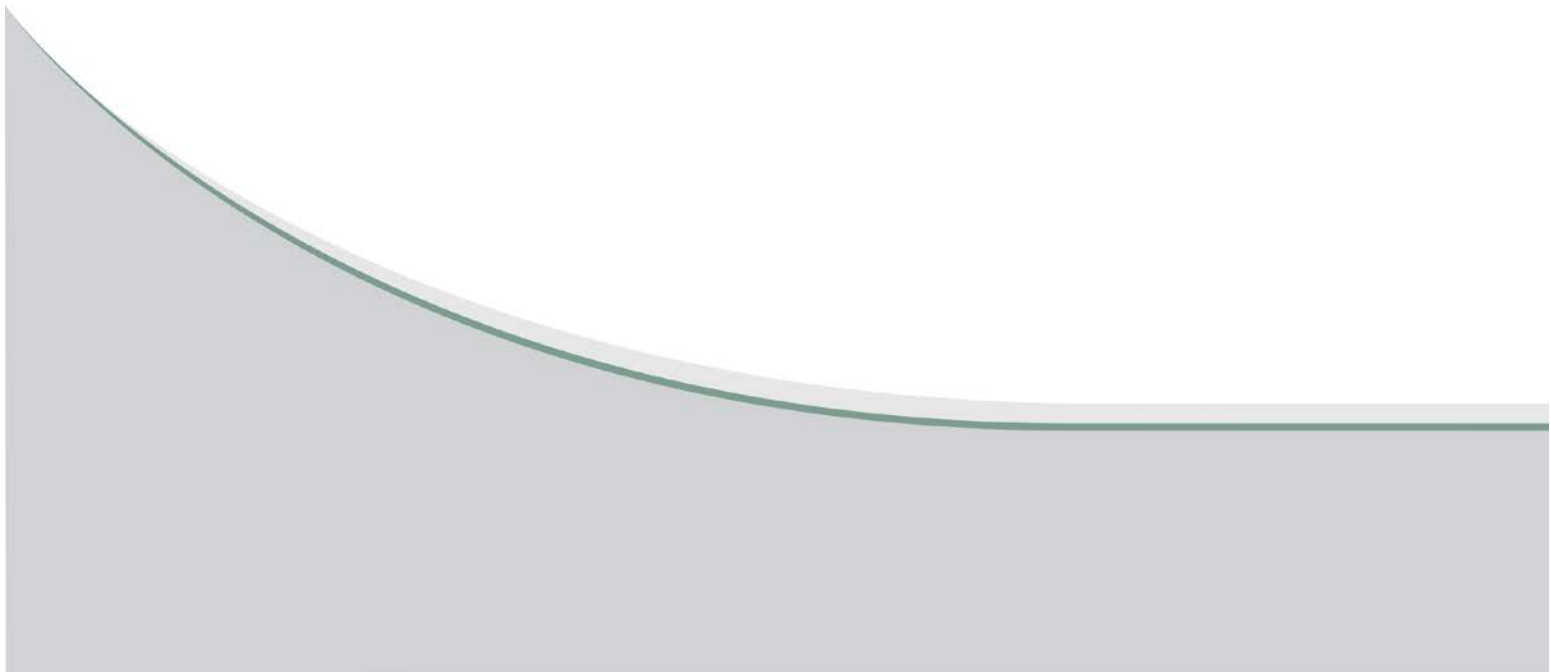
SPECIES	Code	%
Chipping Sparrow	CF	91
Clay-colored Sparrow	P	47
Vesper Sparrow	S	21
Lark Sparrow ‡		2
Savannah Sparrow	H	36
Le Conte's Sparrow	S	25
Nelson's Sparrow		1
Song Sparrow	CF	90
Lincoln's Sparrow	P	41
Swamp Sparrow	V	86
White-throated Sparrow	FY	97
Dark-eyed Junco	T	50
Chestnut-collared Longspur ‡▫		0
Scarlet Tanager ▫	S	20
Rose-breasted Grosbeak	S	90
Indigo Bunting		19
Bobolink		25
Red-winged Blackbird	CF	85
Western Meadowlark		24
Yellow-headed Blackbird		1
Rusty Blackbird ‡▫		<1
Brewer's Blackbird	CF	30
Common Grackle	T	65
Brown-headed Cowbird	FY	51
Baltimore Oriole	T	27
Purple Finch	D	59
House Finch		3
Red Crossbill †		7
White-winged Crossbill ▫		18

SPECIES	Code	%
Pine Siskin	S	48
American Goldfinch	D	84
Evening Grosbeak		35
House Sparrow		19

This list includes all species found during the Manitoba Breeding Bird Atlas (2010-2014) in the region #5 (Nopiming / Winnipeg River). Underlined species are those that you should try to add to this square (14PB71). They have not yet been reported during the atlas, but were reported in more than 50% of the squares in this region during the project so far. "Code" is the code for the highest breeding evidence for that species in square 14PB71 during the project so far. The % columns give the percentage of squares in that region where that species was reported during the project (this gives an idea of the expected chance of finding that species in region #5). Rare/Colonial Species Report Forms should be completed for species marked: § (Colonial), ‡ (regionally rare), † (rare in Manitoba) or ▫ (rare in Manitoba, documentation only required for confirmed records). Current as of 9/11/2017. An up-to-date version of this sheet is available from <http://www.birdatlas.mb.ca/mbdata/summaryform.jsp?squareID=14PB71?lang=en>

[<< previous page](#) [ [continuous pages](#) ]

**APPENDIX G**  
**AQUATIC HABITAT ASSESSMENT**





**North/South Consultants Inc.**  
Aquatic Environment Specialists

---

29 January 2018

Ms. Loni Andres  
KGS Group  
3rd Floor - 865 Waverley Street  
Winnipeg, Manitoba  
R3T 5P4

Dear Ms. Dobson:

Re: Traverse Bay Marina – Fish and Fish Habitat Report

The following is an overview report describing fish and fish habitat conditions at the proposed Traverse Bay marina site. Information provided is largely extracted from available literature, but does include results of a fish habitat survey conducted at the Project site in fall 2017.

If you have any questions regarding the report or wish to incorporate any revisions, please do not hesitate to call me at the number listed below.

Yours truly,

Warren Bernhardt

# Traverse Bay Boat Launch

## Aquatic Environment

A Report Prepared for

KGS Group

By:

North/South Consultants Inc.

January 2018



**North/South Consultants Inc.**  
Aquatic Environment Specialists

---

83 Scurfield Blvd.  
Winnipeg, Manitoba, R3Y 1G4  
Website: [www.nscons.ca](http://www.nscons.ca)

Tel.: (204) 284-3366  
Fax: (204) 477-4173  
E-mail: [nscons@nscons.ca](mailto:nscons@nscons.ca)

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## **1.0 INTRODUCTION**

The Rural Municipality of Alexander, located in Manitoba to the north of Winnipeg and along the shores of Lake Winnipeg, is proposing to develop a boat launch and small marina (the Project) to support boat access to Lake Winnipeg. The proposed Project site is along the shores of Traverse Bay, and is identified in Figure 1. The following provides a brief overview of the aquatic environment occurring at the proposed location, with greater emphasis placed upon describing fish habitat and anticipated fish occurrence at the site.

## **2.0 PHYSICAL ENVIRONMENT**

The proposed Project location on Traverse Bay lies in close proximity to the mouth of the Winnipeg River where it enters the south basin of Lake Winnipeg. The Winnipeg River provides the largest flow inputs to Lake Winnipeg and, consequently, the aquatic environment at the Project location is influenced by physical processes and chemical conditions occurring in both waterbodies. It is anticipated that water level at the site is influenced by Lake Winnipeg water level and Winnipeg River flow. Both Lake Winnipeg outflow via the Nelson River and Winnipeg River inflow to Lake Winnipeg are regulated to provide flood protection and to support hydroelectric generation (Lake of the Woods Control Board 2002; Manitoba Hydro 2017). Water movements in Traverse Bay are complex and are influenced by wind and wave action, lake currents including seiche-related flow, and Winnipeg River inflow. Recent satellite imagery (Zoom Earth 2017) indicates that ice cover at the proposed Project site occurs from about the end of November to late April.

## **3.0 WATER QUALITY**

Baseline water quality has not been characterized at the proposed Project site in Traverse Bay under this Project, but it is anticipated that conditions would reflect the combined characteristics of Lake Winnipeg waters and those entering Traverse Bay from the Winnipeg River. Local physical processes are expected to affect mixing between the two water sources.

Environment Canada and Manitoba Water Stewardship (EC and MWS 2011) present data from 1999 to 2007 for the south basin of Lake Winnipeg. Mean summer water temperature was approximately 22 °C and mean open-water season concentrations of dissolved oxygen were greater than 8.4 mg/L. Shallow water depth and wind driven mixing typically result in uniform water temperature and dissolved oxygen concentrations throughout the water column. The mean annual concentration of total suspended solids (TSS) during the open-water season ranged from 7.7 to 17.4 mg/L.

Lake Winnipeg water is alkaline and characterized by high nutrient concentrations, particularly in the south basin largely due to input from the Red River. From 1999 to 2007, mean annual open-water season concentrations of total phosphorus (TP) and total nitrogen (TN) in the south basin were 0.113 mg/L and 0.869 mg/L, respectively (EC and MWS 2011). Nutrient loading due to tributary inputs in the south basin has long been an issue contributing to deteriorating water quality within the lake (EC and MWS 2011; Environment and Climate Change Canada 2017).



Figure 1. Location of the proposed boat launch at Traverse Bay on Lake Winnipeg.

In contrast, water entering Traverse Bay from the Winnipeg River water is clearer and has lower nutrient concentrations than the Lake Winnipeg south basin. Water quality data collected from 2008 to 2013 as part of Manitoba/Manitoba Hydro's Coordinated Aquatic Monitoring Program (CAMP) indicates that mean TSS values in the Winnipeg River range from 3.8 to 4.9 mg/L (CAMP 2017). Summer TP and TN mean values ranged from 0.022 to 0.026 mg/L and 0.46 to 0.49 mg/L, respectively (CAMP 2017).

#### 4.0 FISH HABITAT

Fish habitat at the Project site was assessed on October 31, 2017. Digital photographs were taken to help describe shoreline conditions and a hydroacoustic survey was conducted to describe the distribution of aquatic macrophytes, water depths, and substrate types. Substrate samples were collected to assist in interpretation of substrate classes from the hydroacoustic data (Table 1). The survey area covered approximately 1 km of Traverse Bay shoreline centered on the proposed Project site, and extended approximately 325 m offshore. Figure 2 illustrates the survey coverage and locations where substrate samples were collected.

Shoreline conditions at the Project site were characterized by steep banks approximately 3 m in height and a narrow beach comprised of mixed gravel and cobble interspersed with boulders (Figure 3). The shoreline has been armoured with large boulders along the fronts of some residential properties in the area and, at two locations immediately to the north of the Project site, the remnants of previously placed rock groins occur. Water depth at the site increased gradually to an approximate mean depth of 2.0 m about 325 m offshore (Figure 4). Substrate conditions were consistent throughout the survey area and were comprised of a band (~ 50 m) of larger substrate materials (gravels, cobble, and boulders) in shallow water along the shoreline and a narrow band (~ 25 m) of fine compacted sands occurring adjacent to and offshore of the band of larger materials (Figure 5). Substrates farther offshore were comprised exclusively of fine uncompacted sands (Figures 5 and 6). No aquatic macrophytes were observed, but small amounts of plant material were observed in a single substrate sample collected at the northern extent of the survey area (Table 1; Figure 2).

Table 1. Locations and substrate descriptions for samples collected at the proposed Project site, fall 2017.

Sample Site	Easting <sup>1</sup>	Northing <sup>1</sup>	Substrate Type	Description
1	678536	5615898	Fine Sand	Uncompacted sand with some plant material
2	678359	5615749	Fine Sand	Fine moderately compact sand
3	678590	5615658	Fine Sand	Fine moderately compact sand
4	678362	5615550	Fine Sand	Fine moderately compact sand
5	678497	5615458	Fine Sand	Fine moderately compact sand
6	678435	5615380	Fine Sand	Fine uncompacted sand
7	678671	5615286	Fine Sand	Fine uncompacted sand
8	678433	5615241	Fine Sand	Fine uncompacted sand with some dark grains, possibly organics

1 - UTM Coordinates, NAD83

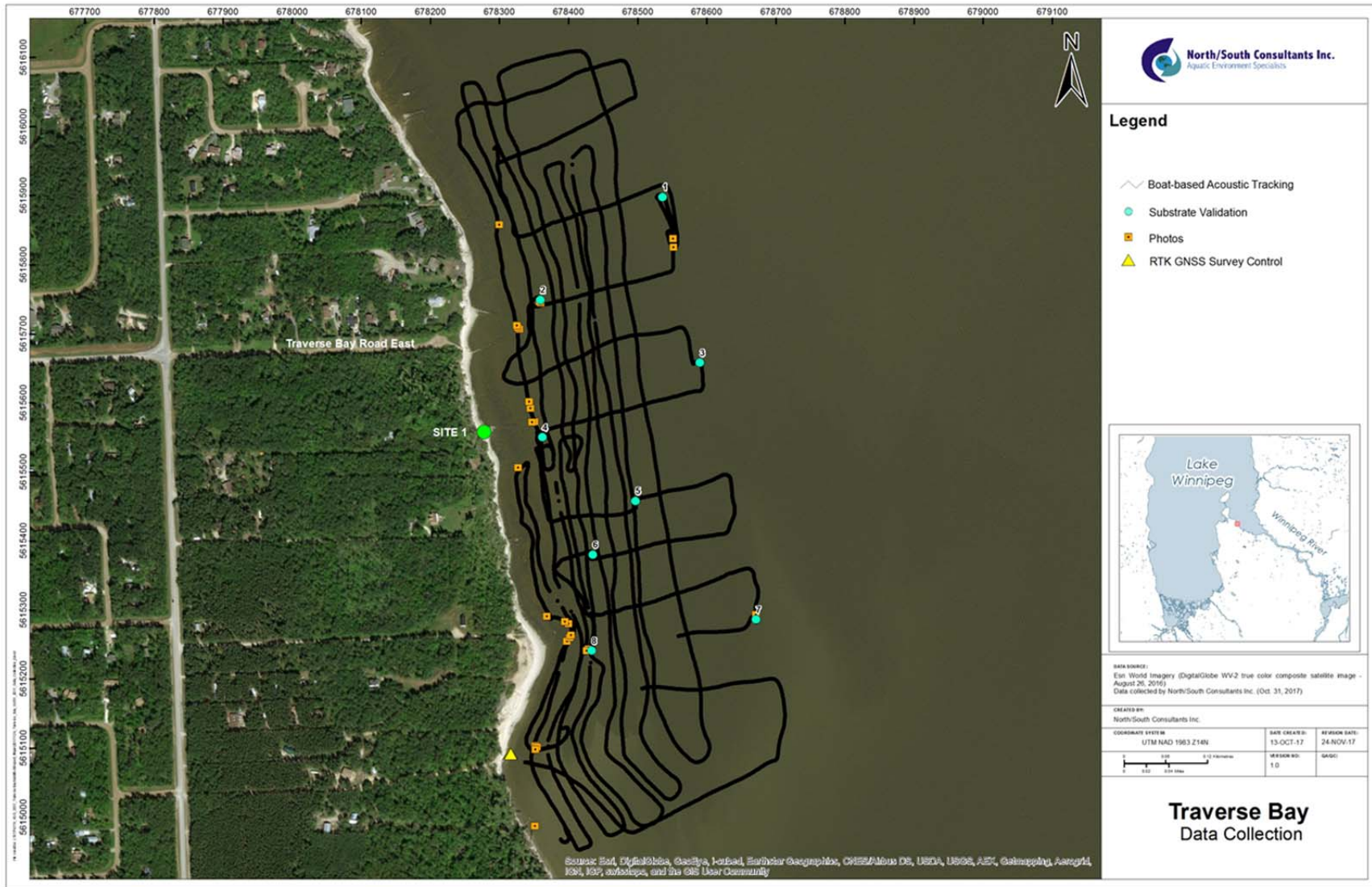


Figure 2. Fish habitat data collected in the vicinity of the proposed Project site, October 31, 2017.



Figure 3. Shoreline conditions at the proposed Project site.







Figure 6. Fine sand characteristic of substrates in offshore areas at the proposed Project site.



Figure 7. Fine sand and vegetation occurring at substrate Sampling Site 1.

## 5.0 LOWER TROPHIC LEVELS

Biological investigations have not been conducted at the proposed Project site, but descriptions of the planktonic and benthic invertebrate communities are provided for the south basin of Lake Winnipeg by EC and MWS (2011). Annual phytoplankton biomass (as chlorophyll *a*) varied from 5.6 µg/L to 19 µg/L between 1999 and 2007. Cyanobacteria were the most prevalent organism, and included nitrogen-fixing (e.g., *Aphanizomenon*, *Anabena*) and non-nitrogen fixing (e.g., *Microcystis*) taxa. Benthic organisms in Lake Winnipeg have increased in density in recent decades. Midges and aquatic worms comprise a large component of the benthic macroinvertebrate community (EC and MWS 2011).

Invasive Zebra Mussels (*Dreissena polymorpha*), a small and highly prolific mussel originating from Europe, were first observed in Lake Winnipeg in 2013. Since then, they have spread through the lake and are now common throughout the south basin (Lake Winnipeg Foundation 2017). It is not known if, but expected that, Zebra Mussels occur at the proposed Project site. The Mapleleaf (*Quadrula quadrula*; Saskatchewan-Nelson River population) has been designated as “threatened” by COSEWIC (COSEWIC 2016) and is listed as “endangered” under the federal *Species At Risk Act* ([SARA]; Species at Risk Public Registry 2018a; DFO 2018a), but are not expected to occur in the vicinity of the proposed Project site (Fisheries and Oceans Canada [DFO] 2018b).

## 6.0 FISH

Although fish use of habitat at the proposed Project site has not been investigated, it is assumed that species occurring in Lake Winnipeg and the Winnipeg River would occur there. Stewart and Watkinson (2004) identified 70 fish species in Lake Winnipeg and 74 from the Winnipeg River (Tables 2 and 3). Of these, 60 species are native to Lake Winnipeg and 61 are native to the Winnipeg River; the remainder of species occurring in each waterbody are those that have recently colonized the area through naturally occurring shifts in range distribution or were accidentally or purposefully transplanted. Invasive fish species of ecological or economic importance occurring in Lake Winnipeg and the Winnipeg River include Carp (*Cyprinus carpio*), White Bass (*Morone chrysops*), and Rainbow Smelt (*Osmerus mordax*) (Table 3).

Fish collections conducted in shallow nearshore waters at Hillside Beach and at other locations along the south shore in Traverse Bay provide some indication of fish use of habitat occurring at the proposed Project site (Dr. C. Patrick Nelson, North/South Consultants Inc., *pers comm*). Based on observations from those collections, it is expected that all life stages of small bodied species such Slimy Sculpin (*Cottus cognatus*), Mottled Sculpin (*C. bairdi*), Trout-Perch (*Percopsis omiscomaycus*) and Longnose Dace (*Rhinichthys cataractae*), as well as juvenile Burbot (*Lota lota*) can be found in the cobble and boulder substrates occurring along the shoreline at the proposed Project site. Species likely occurring in nearshore areas with fine grained substrates include Logperch (*Percina caprodes*), Blackside Darter (*Percina maculata*), and Johnny Darter (*Etheostoma nigrum*). Emerald Shiner (*Notropis atherinoides*) and Spottail Shiner (*Notropis hudsonius*) are expected to be common in nearshore areas, as are young-of-the-year stages of Walleye, Sauger, and White Bass. Juvenile stages of pelagic predatory species such as Walleye, Sauger, and White Bass occupy deeper habitat characterized by fine sand substrates such as

those occurring farther offshore at the Project site. It is expected that other predatory species such as Rock Bass (*Ambloplites rupestris*) may occur along the periphery of nearshore areas characterized by cobble and boulder substrates.

Key species of economic importance occurring in the Traverse Bay area include Walleye (*Sander vitreus*), Lake Whitefish (*Coregonus clupeaformis*), Northern Pike (*Esox lucius*) and Sauger (*Sander canadensis*). Each is an integral component of the Lake Winnipeg commercial fishery (Lake Winnipeg Quota Review Task Force 2011; Manitoba Sustainable Development 2017), and Walleye are targeted in large recreational fisheries occurring in Traverse Bay and the Winnipeg River downstream of Pine Falls (Travel Manitoba 2017).

Table 2. Number of fish species occurring in Manitoba, Lake Winnipeg and the Winnipeg River (after Stewart and Watkinson 2004).

	Manitoba	Lake Winnipeg	Winnipeg River
Native Freshwater (FW) Species	79	60	61
Native FW Species Re-Introduced after Extirpation	1 <sup>1</sup>	0	0
Native FW Species Transplanted outside Native Range	8 <sup>2</sup>	1	2
Introduced FW Species	9	8	9
Human-made FW Hybrids	2	1	2
Estuarine Species in Database	4	0	0
Cumulative	95 <sup>1,2</sup>	70	74

- 1 - Re-introduced native species have already been counted as native species for Manitoba, so they are not added into the total for Manitoba. They are, however, added into the watersheds for into which they were introduced.
- 2 - Transplanted native species have already been counted as native species for Manitoba, so they are not added into the total for Manitoba. They are, however, added into the totals for the watersheds into which they were transplanted.

Table 3. Fish species occurring in Lake Winnipeg and the Winnipeg River (after Stewart and Watkinson 2004).

Family	Common Name	Scientific Name	Lake Winnipeg <sup>1</sup>	Winnipeg River <sup>1</sup>	COSEWIC <sup>2</sup>	SARA <sup>3</sup>
Petromyzontidae	Chestnut Lamprey <sup>4</sup>	<i>Ichthyomyzon castaneus</i>	N	N	Date Deficient	Special Concern <sup>6</sup>
	Northern Brook Lamprey	<i>Ichthyomyzon fossor</i>	O	N Whitemouth and Winnipeg Rivers	-	-
	Silver Lamprey	<i>Ichthyomyzon unicuspis</i>	N	N	-	-
Acipenseridae	Lake Sturgeon <sup>5</sup>	<i>Acipenser fulvescens</i>	N	N	Endangered	-
Hiodontidae	Goldeye	<i>Hiodon alosoides</i>	N	N to Pine Falls	-	-
	Mooneye	<i>Hiodon tergisus</i>	N	N	-	-
Cyprinidae	Lake Chub	<i>Couesius plumbeus</i>	N	N	-	-
	Carp	<i>Cyprinus carpio</i>	I	I	-	-
	Common Shiner	<i>Luxilus cornutus</i>	N Tributaries	N	-	-
	Silver Chub <sup>4</sup>	<i>Macrhybopsis storeriana</i>	N South Basin	O	Not at Risk	Special Concern <sup>6</sup>
	Pearl Dace	<i>Margariscus margarita</i>	N Tributaries	N		
	Hornyhead Chub	<i>Nocomis biguttatus</i>	N Brokenhead River	N Whitemouth River	-	-
	Golden Shiner	<i>Notemigonus chrysoleucas</i>	N Tributaries	N	-	-
	Emerald Shiner	<i>Notropis atherinoides</i>	N	N	-	-
	River Shiner	<i>Notropis blennius</i>	N South Basin	O	-	-
	Bigmouth Shiner	<i>Notropis dorsalis</i>	O	O	Not at Risk	Special Concern <sup>6</sup>
	Blackchin Shiner	<i>Notropis heterodon</i>	O	N	-	-
	Blacknose Shiner	<i>Notropis heterolepis</i>	N Tributaries	N	-	-
	Spottail Shiner	<i>Notropis hudsonius</i>	N	N	-	-
	Carmine Shiner	<i>Notropis percobromus</i>	O	N	Threatened	Threatened
	Weed Shiner	<i>Notropis texanus</i>	N Tributaries	N	-	-
	Mimic Shiner	<i>Notropis volucellus</i>	N Tributaries	N	-	-
	Northern Redbelly Dace	<i>Phoxinus eos</i>	N Tributaries	N	-	-
	Finescale Dace	<i>Phoxinus neogaeus</i>	N Tributaries	N	-	-
	Bluntnose Minnow	<i>Pimephales notatus</i>	O	N	-	-

Table 3. continued.

Family	Common Name	Scientific Name	Lake Winnipeg <sup>1</sup>	Winnipeg River <sup>1</sup>	COSEWIC <sup>2</sup>	SARA <sup>3</sup>
Cyprinidae	Fathead Minnow	<i>Pimephales promelas</i>	N Tributaries	N	-	-
	Flathead Chub	<i>Platygobio gracilis</i>	N	O	-	-
	Longnose Dace	<i>Rhinichthys cataractae</i>	N	N	-	-
	Western Blacknose Dace	<i>Rhinichthys obtusus</i>	N	O	-	-
	Creek Chub	<i>Semotilus atromaculatus</i>	N Tributaries	N 1 Record	-	-
Catostomidae	Quillback	<i>Carpiodes cyprinus</i>	N	N Lower	-	-
	Longnose Sucker	<i>Catostomus catostomus</i>	N	N	-	-
	White Sucker	<i>Catostomus commersoni</i>	N	N	-	-
	Bigmouth Buffalo	<i>Ictiobus cyprinellus</i>	N South Basin	O	Special Concern	Special Concern <sup>6</sup>
	Silver Redhorse	<i>Moxostoma anisurum</i>	N	N	-	-
	Golden Redhorse	<i>Moxostoma erythrurum</i>	N South Basin	N Lower	-	-
Ictaluridae	Shorthead Redhorse	<i>Moxostoma macrolepidotum</i>	N	N	-	-
	Black Bullhead	<i>Ameiurus melas</i>	N	N	-	-
	Brown Bullhead	<i>Ameiurus nebulosus</i>	N	N	-	-
	Channel Cat	<i>Ictalurus punctatus</i>	N	N to Pine Falls T in Lac Du Bonnet	-	-
	Stonecat	<i>Noturus flavus</i>	N Tributaries	O	-	-
Esocidae	Tadpole Madtom	<i>Noturus gyrinus</i>	N Tributaries	N	-	-
	Northern Pike	<i>Esox lucius</i>	N	N	-	-
Umbridae	Muskellunge	<i>Esox masquinongy</i>	O	N rare	-	-
	Central Mudminnow	<i>Umbra limi</i>	N Tributaries	N	-	-
Osmeridae	Rainbow Smelt	<i>Osmerus mordax</i>	I recent	I recent	-	-
Salmonidae	Cisco	<i>Coregonus artedii</i>	N	N	-	-
	Lake Whitefish	<i>Coregonus clupeaformis</i>	N	N	-	-
	Shortjaw Cisco	<i>Coregonus zenithicus</i>	N	N George Lake	Threatened	Threatened <sup>6</sup>
	Western Cutthroat Trout	<i>Onchorynchus clarki lewisi</i>	O	I Whiteshell Provincial Park	-	-

Table 3. continued.

Family	Common Name	Scientific Name	Lake Winnipeg <sup>1</sup>	Winnipeg River <sup>1</sup>	COSEWIC <sup>2</sup>	SARA <sup>3</sup>
	Rainbow Trout	<i>Onchorynchus mykiss</i>	I	I	-	-
	Kokanee Salmon	<i>Onchorynchus nerka</i>	I	I	-	-
	Brown Trout	<i>Salmo trutta</i>	O	I	-	-
	Tiger Trout	<i>(brown and brook trout hybrid)</i>	O	I One Lake	-	-
	Brook Trout	<i>Salvelinus fontinalis</i>	T	T	-	-
	Splake	<i>(brook and lake trout hybrid)</i>	I	I	-	-
	Lake Trout	<i>Salvelinus namaycush</i>	N	N	-	-
Percopsidae	Trout-perch	<i>Percopsis omiscomaycus</i>	N	N	-	-
Gadidae	Burbot	<i>Lota lota</i>	N	N	-	-
Fundulidae	Banded Killifish	<i>Fundulus diaphanus</i>	O	N 1 Record Crowduck Lake	-	-
Gasterosteidae	Brook Stickleback	<i>Culea inconstans</i>	N Tributaries	N	-	-
	Ninespine Stickleback	<i>Pungitius pungitius</i>	N	N	-	-
Cottidae	Mottled Sculpin	<i>Cottus bairdi</i>	N	N	-	-
	Slimy Sculpin	<i>Cottus cognatus</i>	N	N	-	-
	Spoonhead Sculpin	<i>Cottus ricei</i>	N	O	-	-
	Deepwater Sculpin	<i>Myoxocephalus thompsoni</i>	O	N West Hawk Lake and George Lake	-	-
Moronidae	White Bass	<i>Morone chrysops</i>	I	I	-	-
Centrarchidae	Rock Bass	<i>Ambloplites rupestris</i>	N Tributaries	N	-	-
	Pumpkinseed	<i>Lepomis gibbosus</i>	O	N Whiteshell Provincial Park	-	-
	Bluegill	<i>Lepomis macrochirus</i>	O	T Rare, Whiteshell Provincial Park	-	-
	Smallmouth Bass	<i>Micropterus dolomieu</i>	N South Basin	I	-	-
	Largemouth Bass	<i>Micropterus salmoides</i>	I	I Lake of the Woods	-	-
	Black Crappie	<i>Pomoxis nigromaculatus</i>	N Tributaries	N	-	-

Table 3. continued.

Family	Common Name	Scientific Name	Lake Winnipeg <sup>1</sup>	Winnipeg River <sup>1</sup>	COSEWIC <sup>2</sup>	SARA <sup>3</sup>
Percidae	Iowa Darter	<i>Etheostoma exile</i>	N Tributaries	N	-	-
	Johnny Darter	<i>Etheostoma nigrum</i>	N	N	-	-
	Yellow Perch	<i>Perca flavescens</i>	N	N	-	-
	Logperch	<i>Percina caprodes</i>	N Tributaries	N	-	-
	Blackside Darter	<i>Percina maculata</i>	N Tributaries	N	-	-
	River Darter	<i>Percina shumardi</i>	N	N	-	-
	Sauger	<i>Sander canadensis</i>	N	N	-	-
	Walleye	<i>Sander vitreus</i>	N	N	-	-
Sciaenidae	Freshwater Drum	<i>Aplodinotus grunniens</i>	N	N to Pine Falls	-	-

1 - N = native; O = unknown from watershed; I = introduced; N Tributaries = native in tributaries; N South Basin = Native to South Basin; T = transplanted

2 - Committee on the Status of Endangered Wildlife in Canada

3 - *Species at Risk Act*

4 - Saskatchewan-Nelson River populations

5 - Red-Assiniboine Rivers-Lake Winnipeg population; Winnipeg River-English River populations

6 - Pending re-assessment by COSEWIC

Several species occurring in the region have been targeted for enhanced conservation protection by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and are under consideration for additional protection under the *Species at Risk Act* (SARA) or are listed for protection under SARA. These include the following:

1. Chestnut Lamprey (*Ichthyomyzon castaneus*) was designated as “Data Deficient” by COSEWIC (COSEWIC 2010) and remains on Schedule 3 of SARA (Species at Risk Public Registry 2018b);
2. Lake Sturgeon populations occurring in the Winnipeg River and Lake Winnipeg have been designated as “Endangered” by COSEWIC (COSEWIC 2017), but have not been listed under SARA;
3. The Saskatchewan-Nelson River population of Silver Chub was designated as “Not at Risk” by COSEWIC (COSEWIC 2012), but remains listed as “Special Concern” under Schedule 1 of SARA (DFO 2018c; Species at Risk Public Registry 2018a);
4. The Bigmouth Shiner (*Notropis dorsalis*) was listed as “Not at Risk” by COSEWIC (COSEWIC 2003a), but remains listed as “Special Concern” under Schedule 3 of SARA (Species at Risk Public Registry 2018b).
5. The Carmine Shiner (*Notropis percobromus*) was designated as “Threatened” by COSEWIC (COSEWIC 2006) and listed as “Threatened” under Schedule 1 (DFO 2018d; Species at Risk Public Registry 2018a);
6. The Bigmouth Buffalo (*Ictiobus cyprinellus*) was designated as “Special Concern” by COSEWIC (COSEWIC 2009), and is currently listed as “Special Concern” under Schedule 3 of SARA (DFO 2018e; Species at Risk Public Registry 2018b).
7. The Shortjaw Cisco (*Coregonus zenithicus*) was designated as “Threatened” by COSEWIC (COSEWIC 2003b), and is currently listed as “Threatened” under Schedule 2 of SARA (DFO 2018f; Species at Risk Public Registry 2018c).

The majority of the above species are not designated as species at risk on Schedule 1 (Extirpated, Endangered or Threatened) and, therefore, do not receive additional protection under SARA. The extent to which any of these species may use fish habitat occurring at the proposed Project site is not known but is expected to be limited based on their known distributions within the watershed and their habitat preferences. Aquatic species at risk maps produced by DFO suggest that only the Bigmouth Buffalo may occur in the vicinity of the Project (DFO 2018b).

The Carmine Shiner is listed as “threatened” under Schedule 1 and is therefore protected under SARA. The distribution of the species in Manitoba is limited to the Winnipeg River, at the base of Whitemouth Falls, and its tributaries (Whitemouth, Birch, Bird, and Lee rivers; Figure 8). Consequently, it is unlikely that Carmine Shiners will occur at the Project site.

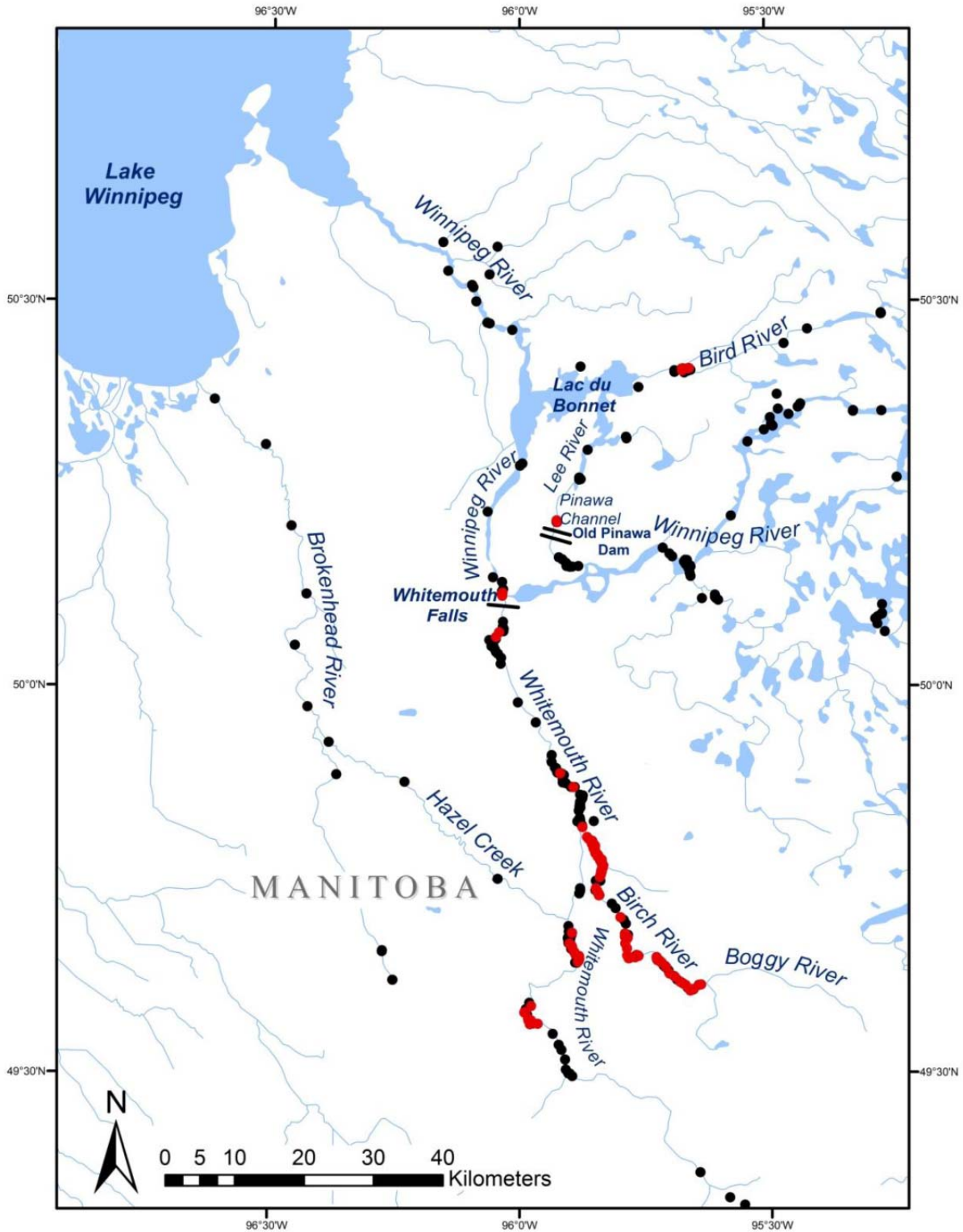


Figure 8. Distribution of Carmine Shiner in Canada. Red dots identify locations where Carmine Shiner were found, black dots are locations sampled without finding Carmine Shiner. Extracted from DFO 2013 (permission provided by DFO).

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