SUN GRO HORTICULTURE CANADA LTD.

Evergreen Bog Peat Harvesting Environment Act Proposal

Revision:
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KGS Group Project:
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October 15, 2020

Manitoba Conservation and Climate
Environmental Approvals
1007 Century Street
Winnipeg, Manitoba R3H 0W4

Attention: Ms. Shannon Kohler
Director

Re: Sun Gro Horticulture Canada Ltd.
Evergreen Bog Peat Harvesting Proposal
Environment Act Proposal

Dear Ms. Kohler:

On behalf of Sun Gro Horticulture Canada Ltd. (Sun Gro), KGS Group is pleased to submit 2 hard copies and 1 electronic copy (USB memory stick) of the Environment Act Proposal submission for the proposed Sun Gro Horticulture Canada Ltd. Peat Harvesting Proposal at Evergreen Bog. As part of the licencing process a Manitoba Conservation and Climate Environment Act Proposal Form with the $7,500.00 application fee has been included with this 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

DL/jr
cc: Tim North – Sun Gro Horticulture Canada Ltd.

EXECUTIVE SUMMARY

Kontzamanis Graumann Smith MacMillan Inc. (KGS Group) was contracted by Sun Gro Horticulture Canada Ltd. (Sun Gro) to prepare a Manitoba Environment Act Proposal (EAP) to obtain the required major alteration to the existing Manitoba Environmental Act License 305R for the proposed expanded peat harvesting development into the Evergreen 1 sub-area. The proposed peat harvesting development will not likely result in significant adverse environmental effects, based on the available information for this project, the environment, the assessment of environmental effects outlined in this environmental assessment report, and application of proposed mitigation measures, including conducting the required follow-up.

Sun Gro is the largest producer of peat moss in North America and the largest distributor of peat moss and peat-based growing media products. In order to sustain Sun Gro's current needs it is necessary to develop the Evergreen 1 sub-area for future peat moss harvesting. Sun Gro previously held a quarry lease for the Evergreen 1 site in anticipation of this future need, which has since been converted to a Peat Harvest Licence (PHL) along with several other quarry leases. The purpose of the proposed Evergreen 1 sub-area development is to continue to provide quality peat-based growing media products to meet the demand of the distribution network in over 40 countries worldwide.

The scope of the project includes planning, designing, constructing, operating, maintenance and eventual decommissioning and restoration of the proposed peat development at the Evergreen 1 sub-area. The scope of the assessment included identification, assessment and mitigation of adverse environmental effects of the project, and evaluation of the significance of residual environmental effects. The scope of the assessment also included consideration of direct and indirect biophysical and socio-economic effects.

The project will include an access road, bog roads, drainage ditch system, and an outlet ditch with a gated culvert which discharges water into an existing drainage ditch used for the adjacent Evergreen 2 and 3 sub-areas. Major project activities include providing access, clearing vegetation and surface soils, harvesting and stockpiling unprocessed peat, excavating and trenching, transporting and restoring harvested peatland.

The environmental assessment of the proposed peat development was carried out based on project information provided by Sun Gro and in accordance with the Manitoba Environment Act Proposal Report Guidelines (2018). Additional information was acquired from literature and internet searches, publications by the peat industry and environmental organizations; contacts with provincial government representatives; engagement with stakeholders; and site investigations by the project team. Requirements of The Environment Act (Manitoba) and regulations were followed in the preparation of this EAP.

Information regarding the proposed peat development project has been provided to identified stakeholders in the region through various means, including letters, telephone conversations, and meetings with community representatives as part of a community engagement program. Comments and concerns expressed by stakeholders and mitigation measures to address them have been summarized in this EAP.

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STATEMENT OF LIMITATIONS AND CONDITIONS

Limitations

This report has been prepared for Sun Gro Horticulture Canada Ltd. (Sun Gro) in accordance with the agreement between KGS Group and Sun Gro (the "Agreement"). This report represents KGS Group's professional judgment and exercising due care consistent with the preparation of similar reports. The information, data, recommendations and conclusions in this report are subject to the constraints and limitations in the Agreement and the qualifications in this report. This report must be read as a whole, and sections or parts should not be read out of context.

This report is based on information made available to KGS Group by Sun Gro. Unless stated otherwise, KGS Group has not verified the accuracy, completeness or validity of such information, makes no representation regarding its accuracy and hereby disclaims any liability in connection therewith. KGS Group shall not be responsible for conditions/issues it was not authorized or able to investigate or which were beyond the scope of its work. The information and conclusions provided in this report apply only as they existed at the time of KGS Group's work.

Third Party Use of Report

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.

Geo-Environmental Statement of Limitations

KGS Group prepared the geo-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 Sun Gro. As this 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.

1.0 INTRODUCTION

Kontzamanis Graumann Smith MacMillan Inc. (KGS Group) was retained by Sun Gro Horticulture Canada Ltd. (Sun Gro) to prepare a Manitoba Environment Act Proposal (EAP) for the proposed Evergreen 1 sub-area peat harvesting development to obtain the required major alteration to the existing Manitoba Environmental Act License 305R (Manitoba Sustainable Development, 2018a; Appendix A). The proposed project consists of expanding the existing peat harvesting development at the Evergreen Bog to include an additional sub-area (Evergreen 1; Figure 1). As harvesting at other sub-areas at the Evergreen Bog (Evergreen 2 and 3) is nearing the end of its lifespan, new harvest areas are required to maintain production. An EAP is required for environmentally significant developments within the province of Manitoba, under *The Environment Act* (C.C.S.M. c. E125). The purpose of this EAP is to ensure that the proposed peat harvesting operation is designed, constructed and operated in an environmentally responsible manner consistent with provincial environmental legislation, policies and guidance. A peat harvesting operation such as the one proposed by Sun Gro is considered a mining development under the Classes of Development Regulation 164/88 and is therefore considered a Class 2 Development. The EAP was prepared in accordance with the Manitoba *Environment Act Proposal Report Guidelines* (Manitoba Sustainable Development, 2018b).

Sun Gro is the largest producer of peat moss in North America and the largest distributor of peat moss and peat-based growing media products to the North American professional plant growers market. Sun Gro sells products primarily to professional greenhouse, nursery and specialty crop growers throughout North America, as well as to golf course developers and landscapers. In order to sustain current needs it is necessary to develop the Evergreen 1 sub-area for future peat moss harvesting. Sun Gro previously held a quarry lease for the Evergreen 1 sub-area in anticipation of this future need, which has since been converted to a Peat Harvest Licence (PHL) along with several other quarry leases. The purpose of the proposed development is to continue to provide quality peat-based growing media products to meet the demand of the distribution network in over 40 countries worldwide.

Sun Gro was founded in 1929 in British Columbia as the Western Peat Company Ltd., as a producer of peat moss. Initial success enabled the company to grow and its operations expanded throughout British Columbia and eastward into central Canada. The business has had a number of owners over the years and was acquired by Madison Dearborn Partners II, L.P. ("Madison Dearborn") in 1995, a Chicago based private equity firm. Sun Gro operates in 25 locations throughout North America, many of which in small rural towns and are committed to providing jobs that are safe and pay a fair wage. Sun Gro employs over 800 people and contributes to the economic well-being of local communities. Sun Gro is also committed to minimizing the impact on the local environment and takes great pride in their stewardship of natural resources.

1.1 Previous Studies and Activities

A summary of notable past studies and activities completed in relation to the project is as follows.

- Peat harvesting began at the nearby Evergreen 2 and 3 bogs in 1972 under a Peat Surface Lease. A processing plant that was constructed at the site in 1972 was in operation until the early 1980s. An

Environment Act Licence was issued for Evergreen 2 and 3 in 1973, which was revised in 2018 to reflect the new regulatory requirements pursuant to *The Peatlands Stewardship Act*.

- The Province of Manitoba Department of Energy and Mines conducted a survey of multiple bogs throughout southern Manitoba under the Canada-Manitoba Mineral Exploration and Development Agreement to evaluate their potential for commercial peat harvesting operation (Bannatyne, 1980). As part of this survey peat testholes were sampled at the Evergreen 1 bog in 1976 (then referred to as Northwest Evergreen Bog) and determined that the bog held up to 1,145,000 m^3 of peat (Bannatyne, 1980).
- In 2015, several existing Quarry Peat Leases were converted into a PHL in accordance with *The Peatlands Stewardship Act* which came into force on June 15, 2015. PHL No. 3 Julius is comprised of 10 Quarry Lease areas (now termed sub-areas) including Evergreen 1, 2, 3, North Julius, Julius Lake West, South Julius 1 and 2, Moss Spur 1, 2, and 3.
- In accordance with *The Peatlands Stewardship Act,* Sun Gro submitted an associated Peatland Management Plan (PMP), Peatland Recovery Plan (PRP), and a Community Engagement Plan (Sun Gro, 2019; Sun Gro, 2018a; Vertex, 2018). The PMP promotes responsible economic development of Crown peatlands through proactive resource planning and long-term peat resource management strategies (Manitoba Sustainable Development, 2017a). The PRP outlines how the harvest areas will be restored once operations at a given site are complete. The Community Engagement Plan outlines Sun Gro's engagement plan within the regional area. At the time of submission of the PMP, PRP and Engagement Plan, Sun Gro did not anticipate harvesting at Evergreen 1 within the PHL timelines (2015-2030). Given that Sun Gro now plans to harvest at Evergreen 1, the proposed development change will require review by the Manitoba Conservation and Climate in accordance with the PHL Guidelines (Government of Manitoba, 2017a). The review and consultation requirements required to satisfy the PHL will be combined with the Environment Act Licence (Government of Manitoba, 2017a).
- A peat assessment was conducted at Evergreen 1 in the spring of 2020 to supplement and confirm investigations conducted by the Manitoba Department of Energy and Mines (KGS Group, 2020). The investigation confirmed that peat at the Evergreen 1 was of sufficient quality and quantity to warrant harvesting.

2.0 PROJECT DESCRIPTION

The following sections have been structured to address the Description of Proposed Development requirements as outlined in the EAP Form (Manitoba Sustainable Development, 2018).

2.1 Status of Title

As the proposed project lies on Crown Land, there are no Certificates of Titles available, however Sun Gro holds the peat harvesting rights for the proposed harvest area under Manitoba Peat Harvest Licence (PHL) No. 3 – Julius (PHL No. 3). The Evergreen 1 sub-area is located on parts of Sections 16 and 17, Township 13, Range 10, E1.

2.2 Mineral Rights

Sun Gro holds the peat harvesting rights to the Evergreen 1 sub-area within PHL No. 3. Evergreen 1 is one of ten sub-areas for which Sun Gro holds the peat harvesting rights under PHL No. 3.

Evergreen 1 covers 144 ha, however only approximately 60 ha is proposed to be harvested, as shown on Figure 2. Other areas have insufficient peat depth to warrant harvesting and/or fall within buffer areas around water bodies and the sub-area boundary. The bog is estimated to contain approximately 867,000 m^3 of Sphagnum moss. This is equivalent to approximately 86,700 tonnes of product assuming 0.1 tonnes of product per cubic metre of peat harvested.

2.3 Existing and Adjacent Land Use

The proposed harvest site is currently a forested peat bog in a remote location covered predominantly with black spruce. An access road, which serves to maintain the existing drainage ditch from the Evergreen 2 and 3 sub-areas is present on the east side of the site (Photo 1; Appendix B). This access road terminates approximately 350 north-east of the Evergreen 1 sub-area. Several old cut lines are present within the forested area, possibly related to former natural resource exploration.

Land use within the regional study area includes a mixture of resource extraction and recreation including forestry, agriculture, hunting, trapping, fishing, outfitting, snowmobiling, camping and recreational cabins.

2.4 Land Use Designation and Zoning

The proposed harvest site is on Crown land within the Rural Municipality (R.M.) of Lac du Bonnet. The site is within the Agassiz Provincial Forest. The Evergreen 1 sub-area is located on parts of Sections 16 and 17, Township 13, Range 10, E1.

2.5 Proposed Development

The proposed Evergreen 1 sub-area peat harvesting project will include the components described in the following sub-sections.

2.5.1 ACCESS ROAD

An access road will be constructed to connect the Evergreen 1 sub-area to the existing Evergreen 2 and 3 staging area (Photo 2; Appendix B), which is connected to Provincial Trunk Highway (PTH) 44 via a 3 km gravel access road (Figures 1 and 2). From the staging area, the access road to Evergreen 1 will follow an existing gravel road to the west approximately 0.3 km. From there, the access road will go northward for 1.1 km across the existing Evergreen harvesting area (Photo 3; Appendix B). From the north side of the harvest area, the road will go west for 0.4 km where it will connect to an existing road that runs east of the Evergreen 1 sub-area. This existing road is currently used for maintaining the existing drainage ditch outflow from the Evergreen 2 and 3 sub-areas. Following this existing road northward 1.1 km leads to the approximate location where the Evergreen 1 sub-area would be accessed. The total access road length from the staging area is 2.9 km. With the exception of the initial 0.3 km adjacent to the Evergreen 2 and 3 staging area, the remaining 2.6 km will require upgrades to accommodate peat haul trucks. Upgrades will include placing additional material (gravel) to the existing access road where necessary. The existing 3 km access road from the staging area to PTH 44 will not require any upgrades.

The access road will generally be 15 m (50 feet) wide with a 2 percent minimum grade. The section of the access road on the bog will be 9 m (30 feet) wide. This will be sufficient for simultaneous ingress and egress of emergency vehicles in the event of an emergency. Ditches will be constructed on both sides of the road. Material excavated during ditching will be used to build the road base. Gravel will be hauled on-site from the nearest available source and spread to a thickness that will be determined on-site after evaluating the road base condition.

An existing ditch is present on the east side of the access road which functions as the outlet ditch for the Evergreen 2 and 3 sub-areas. This ditch is 2.2 km long from the northwest corner of the Evergreen 2 sub-area up to where it discharges overland to the north-east of the Evergreen 1 sub-area. Drainage from the Evergreen 1 sub-area will discharge into this existing outlet ditch approximately 1.1 km upgradient from the overland discharge location.

The access road alignment has existing culvert crossings installed at the south end of the Evergreen 2 and 3 harvest area, at the north end of the Evergreen 2 and 3 harvest area, and at the north-west corner of the Evergreen 2 and 3 harvest area. A new culvert will be installed under the access road adjacent to the Evergreen 1 sub-area as shown in Figure 2 to discharge site drainage to the existing outlet ditch on the east side of the road. The new culvert to be installed under the access road will consist of a 30” (0.76 m) galvanized culvert which is sufficient to pass flow from the harvest area to the outlet ditch.

2.5.2 FIELD DRAINAGE DITCHES

Field drainage ditches are used to remove interstitial surface water and prepare the peat surface for harvesting after clearing. A network of parallel ditches will be cut through the bog using a “V” ditcher. Each field ditch is excavated to 1.5 m deep and 1.5 m wide and spaced approximately 33 m apart. Field drainage ditches will typically be constructed at 90° angles to the main drainage ditches. At the peak development with all 60 ha under operation, a total of 67 field ditches will have been cut (Figure 2). Water will drain from the field ditches into the main drains, where it will eventually flow off-site. Field ditch construction is typically completed during the winter when the peat is frozen. Therefore, initial site drainage is highest during the spring runoff period. After this period, water will drain more gradually; however, the rate at which water

drains from the bog will depend on the amount of precipitation. Water will continue to drain from the bog until the arrival of frost.

The Evergreen 1 sub-area will likely be opened up over a two year period, however to be conservative calculations within the EAP have assumed that the initial development of the full 60 ha will occur within one year. The storage volume of the development area was calculated to estimate the potential water discharge following the development of the field drains. Based on the field ditches being cut to a depth of 1.5 m the total volume of peat to be drained is approximately 900,000 m^3. This volume of peat will hold approximately 855,000 m^3 of water assuming an average 95% moisture content before drainage. Moisture content generally varies between 60 to 85% following drainage after the field ditches are cut (Thibault, 1998). Therefore, assuming an average of 70% moisture content remains after drainage (25% drains), the volume of drainage water from opening 60 ha of peatland will total approximately 225,000 m^3. It will take approximately three weeks in spring to drain the ditches which were cut during the winter. Based on a hydraulic analysis of the site, the initial average discharge was calculated to be approximately 0.12 m^3/s during the three week spring drainage. This initial water discharge flow rate for the 60 ha harvest area is much lower than the median annual flood (1 in 2 year event), of 2.1 m^3/s, which the downstream culvert crossings have sufficient capacity to accommodate (see Section 5.3.5).

As peat is harvested, the drainage ditches must be deepened to maintain their depth. The ditches are typically deepened by approximately 0.15 m every second year. Ditch deepening activities were assumed to take approximately 11.5 days over the 60 ha area, with an additional 2.5 days for the drainage to occur as each ditch is deepened. Therefore, during each operational ditch deepening, the average discharge was calculated to have a temporary increase of approximately 0.02 m^3/s. Since the 0.02 m^3/s increase is less than the increase of 0.12 m^3/s due to initial site drainage, the increase of 0.12 m^3/s was assumed in the analyses as a conservative approach in determining the potential effects to downstream drainage (see Section 5.3.5).

2.5.3 MAIN DRAINAGE DITCHES

Field drains will drain into main drainage ditches which will be excavated primarily around the perimeter of the harvesting area (Figure 2). The main drainage ditches will be approximately 2 m wide and 3 m deep and are designed with a low gradient to maintain a slow flow so that they will be more conducive to settlement of suspended solids. The main drainage ditches connect the field ditches to the outlet ditch. Drainage water from the field ditches flows through the main ditches into an outlet ditch east of the harvest area, which will discharge into the existing outlet ditch for Evergreen 2 and 3. A site layout of the proposed area is shown in Figure 2.

2.5.4 OUTLET DITCH

The outlet ditch conveys water from the main drains off-site to natural discharge points in order to integrate the drainage into the existing drainage system, and cause minimal change to the water regime. The Evergreen 1 outlet ditch will discharge water into the existing outlet ditch from the Evergreen 2 and 3 sub-areas (Photo 4; Appendix B), where it will extend through NE-17-13-10 E1, NW-16-13-10 E1 and SW-21-13-10 E1 where it will discharge overland (Photo 5; Appendix B), and eventually toward the Winnipeg River.

The Evergreen 1 outlet ditch will have a control culvert with a sliding gate installed. The gate will be used to regulate water levels in the peat layer within the harvesting area and allow for control of water discharge

from the site. The gate can be closed as needed to slow the water flow and allow for the settlement of suspended peat particles prior to the water being discharged off-site. The gate can also be used to reduce or stop discharge in the event of a major precipitation event which exceeds the design flow criteria. The control gate will remain closed until the main drain construction is complete and the drain blocks have been removed.

The outlet ditch will be cleaned periodically when accumulated sediment is observed. Cleaning will take place before and after any significant ditch cleaning or cutting takes place within the upstream catchment area. The control gate would remain closed until the cleaning operation is complete and remaining disturbed sediment has an opportunity to settle. Solids will be scooped from the ditch with a backhoe. The recovered settlement will be reapplied to the harvest area.

Water quality will be monitored immediately downstream of the outlet culvert. Water samples will be taken on a monthly basis for analyses of total suspended solids and pH. Additional samples may be taken on an as required basis.

2.5.5 BOG ROADS

The bog roads connect the access road to the individual bog fields. The roads will be constructed using non-merchantable timber and surface vegetation that is removed from the fields as part of the preparation for harvesting. A clay base and gravel topping will be added to allow trucks access to the fields for loading purposes (Figure 2).

2.5.6 FACILITY AND EQUIPMENT REQUIRED AT PROPOSED PEAT DEVELOPMENT SITE

No new staging area will be developed as part of the proposed project. On-site facility and equipment storage will remain at the existing licensed staging area used for the Evergreen 2 and 3 sub-areas (Figure 2; Photo 2; Appendix B). This area is approximately 0.15 ha in size and consists of a gravel parking area for peat harvesting equipment storage and employee vehicle parking. The staging area also contains a portable washroom for employees which is maintained by a local authorized contractor.

On-site equipment will include farm tractors to haul and power the different types of peat harvesting operation equipment, loaders to push stacks and load trucks, dozers and excavators to maintain bog operations.

2.5.7 SCHEDULE OF PROJECT STAGES AND ACTIVITIES

Development at the site is expected to begin once the necessary project approvals have been received. The schedule presented here and summarized in Table 1 is based on the assumption of receiving the necessary approvals and permits in early 2021. Initial work would consist of clearing 60 ha of trees within the harvest area in the winter 2021 and installation of drainage ditches. Subsequent work in the spring and summer of 2021 would include additional site preparation and contouring, drainage installation, as well as upgrading the access road from the current Evergreen 2 and 3 staging area to the Evergreen 1 sub-area. Peat harvesting at Evergreen 1 would begin as early as 2021, however if site preparation is not complete in 2021 harvesting would begin in 2022.

The development plan proposes that peat harvesting operations start with harvesting all 60 ha in 2021. Harvesting will occur at the full 60 ha harvest area for the estimated project lifespan of approximately 17 years, from 2021 until approximately 2037, based on an estimate average peat production rate of approximately 850 m^3/ha/year and an estimate total of 867,000 m^3 of horticultural grade peat. At this point, the bog area is expected to be harvested down to the final planned depth of harvesting. A minimum of 0.5 m of peat will remain in place after harvesting. Restoration activities will begin once peat harvesting is complete at the sub-area.

2.6 Funding

Funding for the proposed development comes from Sun Gro.

2.7 Other Approvals

In addition to the PHL which Sun Gro has already obtained and the Environment Act Licence which is being applied for as part of this Environment Act Proposal, Sun Gro will require the following licences/permits (Government of Manitoba, 2017):

- A General Permit from Crown Lands is required under *The Crown Lands Act* for the access road;
- A Work Permit from Manitoba Conservation and Climate is required to authorize work on Crown land;
- A Licence to Construct Water Control Works from Manitoba Conservation and Climate is required to authorize drainage, water flow, and level alteration; and
- A Timber Appraisal is required to from the Forestry and Peatlands Branch to authorize removal of any timber within the PHL;

Sun Gro will also be required to revise the existing Peatland Management Plan and Peatland Restoration Plan for PHL No. 3 to account for harvesting at Evergreen 1 sub-area within the PHL license terms. The current PHL will also have to be renewed prior to its expiry in 2030.

3.0 INDIGENOUS AND PUBLIC ENGAGEMENT

An Indigenous and public engagement program was developed and carried out to support the EAP. The engagement program included preparation of engagement materials, identification of potentially affected stakeholders, distribution of project information, and communication with identified stakeholders. A communication log was maintained to document inquiries, follow-ups, responses and action items. Meetings occurred with the R.M. of Brokenhead Council and Town of Beausejour Council and staff (August 12, 2020) and the Manitoba Metis Federation (August 20, 2020). Details of meeting results, questions/concerns, stakeholder correspondence, the communication log, sample letters and engagement presentation slides are provided in the Community Engagement Report in Appendix C.

4.0 EXISTING ENVIRONMENT

4.1 Biophysical

4.1.1 PHYSIOGRAPHY AND CLIMATE

The Evergreen 1 sub-area is located within the Stead Ecodistrict of the Lake of the Woods Ecoregion in the Boreal Shield Ecozone (Smith et al., 1998). The Stead ecodistrict is the western-most ecodistrict within the Lake of the Woods Ecoregion which extends from the south-east corner of Lake Winnipeg on the north-west, to the United States border to the south, and into Ontario to the east.

The Stead Ecodistrict falls within the borders of the ancient glacial Lake Agassiz and has a surface that varies from level to gently undulating, and consists of areas of depressional glaciolacustrine plain dominated by peatlands, glacial till, fluvioglacial outwash plain, and hummocky uplands (Smith et al. 1998). Elevations within the ecodistrict range from 221 to 290 m above sea level. The central area of the ecodistrict, within which the project is situated, is flat, poorly drained, with glaciolacustrine deposits and extensive areas with peat. Constructed drainage is present in a large part of this area which allows for some areas to be used for agricultural crops (Smith et al., 1998). Drainage within the ecodistrict flows towards Lake Winnipeg, with the western part of the ecodistrict falling within the Brokenhead River division and the eastern part of the ecodistrict being within the Winnipeg River division. Both rivers flow to Lake Winnipeg and are part of the Nelson River drainage system (Smith et al., 1998). Soils in depressional lowland areas of the ecodistrict, such as the project location, consist of poorly drained peaty Gleysols and Typic/Terric mesosols.

The Stead Ecodistrict is located within the Subhumid Low Boreal Ecoclimate Region. The region is characterized by short warm summers and long cold winters. The nearest weather station with historical data is in Pinawa, approximately 20 km east of the project site. Data from the Pinawa weather station is based on a 30-year record from 1981 – 2010 (Environment Canada, 2020). The mean annual air temperature at the weather station is 2.8°C and the daily mean temperature ranges between 19.3°C in July and -16.6°C in January (Environment Canada, 2020). Precipitation at the station averages 578 mm annually, with 464 mm falling as rain and the remainder falling as snow. June has the highest average rainfall (98.8 mm) and December has the highest average snowfall (24.0 cm) (Environment Canada, 2020).The average growing season within the ecodistrict is 180 days with approximately 1,600 growing degree-days and an average annual moisture deficit of 90 mm (Smith et al., 1998).

4.1.2 AIR QUALITY

Real-time air quality concentrations are monitored at several sites in Manitoba. While not all sites record the same parameters, most sites measure particulate matter ($PM_{2.5}$), ozone (O_3), nitric oxide (NO), nitrogen dioxide (NO_2), nitrous oxides (N_2O), carbon monoxide (CO) and sulphur dioxide (SO_2). At present however, routine air quality monitoring only occurs in urban areas.

The Department of Environment and Climate Change Canada has developed an Air Quality Health Index (AQHI) which converts air quality measurements into a single index that represents the measured quality of air. The AQHI provides a general idea of air quality to the public broken into four risk levels (Table 2). It is provided in this report for reference purposes only as the study area is a remote location.

TABLE 2: AIR QUALITY HEALTH INDEX

Health Risk	Air Quality Health Index	Health Messages	
		At Risk Population	General Population
Low Risk	1-3	Enjoy your usual outdoor activities.	Ideal air quality for outdoor activities.
Moderate Risk	4-6	Consider reducing or rescheduling strenuous activities outdoors if you are experiencing symptoms.	No need to modify your usual outdoor activities unless you experience symptoms such as coughing and throat irritation.
High Risk	7-10	Reduce or reschedule strenuous activities outdoors. Children and the elderly should also take it easy.	Consider reducing or rescheduling strenuous activities outdoors if you experience symptoms such as coughing and throat irritation.
Very High Risk	Above 10	Avoid strenuous activities outdoors. Children and the elderly should also avoid outdoor physical exertion.	Reduce or reschedule strenuous activities outdoors, especially if you experience symptoms such as coughing and throat irritation.

(https://weather.gc.ca/airquality/healthmessage_e.html)

It is expected that the AQHI for the regional study area is typically low risk throughout the year; although there are no published sources of air quality data. Air quality in the area is generally excellent compared to large cities and commercial and industrial areas in Manitoba and Canada. Other industrial developments within the regional study area include a granite quarry off PTH #11, several sand and gravel pits off of PTH #44 and PTH #214, and two other peat harvest areas. Other developments in the regional study area include small towns (Seddons Corner, Siegs Corner, and Brookfield), a correctional centre, forestry, and recreational activities (ATVs, snowmobiles). The regional study area is otherwise predominantly undeveloped forest, with agriculture at the eastern and western limits. The AQHI may be periodically reduced to Moderate Risk during dry periods resulting in dust along the access road and in peat harvest areas during periods of high winds affecting the peat harvesting area, or during forest fires that may result in increased particulates.

4.1.3 GEOLOGY

The Lake of the Woods Ecoregion is underlain with bedrock consisting predominantly of crystalline Archaen rocks, with areas of Palaeozoic limestone erosion remnants in the north-west area of the ecoregion (near project location). Elevation ranges from 390 m above sea level (masl) in the south-east to 215 masl in the north-west of the ecoregion. The area has variable thickness layers of glacial till, fluvioglacial, and peat-covered glacial Lake Agassiz deposits. Exposed bedrock outcrops are more common near the centre and eastern limits of the ecoregion (Smith et al., 1998)

4.1.4 SOILS

As part of peat investigations conducted at the Evergreen 1 sub-area, KGS Group completed 11 peat cores in April and May of 2020 (KGS Group, 2020). Live sphagnum peat was present from surface to depths ranging

from 0.15 m to 0.6 m below ground surface. The top layer of sphagnum peat was followed by a layer of organic peat which ranged from 0.40 m to 2.75 m thick. Below the organic peat layer clay or silty clay was generally encountered at depths ranging from 1.23 m to 3.8 m below the ground surface. This low permeability clay cover forms a very good barrier between the perched water within the peat layer and the groundwater in the underlying aquifers described in the following section.

Soils within the broader ecodistrict are variable based on drainage conditions. Depressional lowland areas generally consist of poorly drained peaty gleysols and typic (deep) and terric (shallow) mesisols, which developed primarily on sedge peat. Upland areas consist generally of dark gray chernozems which overlay glacial till (Smith et al., 1998).

4.1.5 GROUNDWATER

Groundwater within the Stead ecodistrict is primarily found in sandy and gravelly aquifers associated with the glacial till, inter-till, beach, and fluvioglacial deposits (Smith et al., 1998). The widely distributed sand and gravel aquifers are associated with a series of upland moraines and glaciofluvial deposits which form the primary source of potable water in the area (Betcher et al., 1995). Regional aquifer supply is very good with groundwater quality generally being excellent. Total dissolved solids in regional groundwater are generally between 300 mg/L and 500 mg/L (Betcher et al., 1995). Beyond areas with extensive sand and gravel aquifers, surficial aquifers are more local in nature with reduced yield and reduced water quality (Betcher et al. 1995).

A search of a provincial groundwater well database (GW Drill, 2018) indicated the presence of a single groundwater well within 3 km of the Evergreen 1 sub-area. This particular well was a test well drilled in 1969 and was dry. The next nearest recorded well is 3.4 km from the site. A total of nine groundwater wells are present within three to five km from the harvest area. Registered wells are within sand and gravel and consist of a mixture of domestic production wells and test wells. Wells are generally cased to depths of 20 m to 30 m below ground surface with water generally present at 3 m depth (GW Drill, 2018).

4.1.6 SURFACE WATER

The Stead Ecodistrict is located within the Lake Winnipeg watershed that is part of the Nelson River drainage system. Major rivers in the area include the Winnipeg River and the Brokenhead River, which both drain into Lake Winnipeg. (Smith et al., 1998). As noted in section 4.1.1, the area is generally poorly drained, although overall surface water in the ecodistrict flows north-west towards Lake Winnipeg.

Water bodies within the development area include two small circular unnamed lake (Photos 6 and 7; Appendix B). Each lake has a diameter of between 250 m and 300 m. Additional water bodies within the project study area include an unnamed lake south-west of the harvest area, as well as several drainage areas with beaver dams that can result in beaver ponds. A low-lying flooded grassy area with a small central channel is present north-east of the sub-area, however there is no discernable flow. Additional water bodies within the regional study area include the Winnipeg River, several small unnamed creeks which appear ephemeral that drain into the west side of the Winnipeg River, and beaver ponds in low-lying areas.

The Evergreen 1 sub-area is situated at a divide in drainage basins whereby water at the south and west sides flows south-west toward the Brokenhead River (Figure 3 – Catchment SB1) and at the north and east sides flows north-east toward the Winnipeg River (Figure 3 – Catchment SB2). Catchment SB1 covers an area of

43.1 km^2 and conveys flow across PR 214 towards the Bachman East Drain and eventually to the Brokenhead River. Catchment SB2 covers an area of 34.8 km^2 and conveys flow towards an unnamed creek which crosses PTH 11 and discharges into the Winnipeg River. The natural flow patterns in the development area are illustrated in Figure 3. Average slopes in the area range from 0.2% to 0.3%. A Regional Flood Frequency analysis was used to define the frequency flows at the PR 214 and PTH 11 crossing sites. Flow rates at the PR 214 and PTH 11 crossing sites for a 1 in 2 year flood event were calculated to be 1.8 m^3/s and 2.1 m^3/s, respectively, while flow rates during 1 in 100 year flood were calculated to be 7.3 m^3/s and 8.6 m^3/s, respectively. Since all proposed flows are directed north-east, a backwater model of the unnamed creek crossing was developed using the HEC-RAS 1-dimensional hydraulic modelling software developed by the U.S. Army Corps of Engineers to assess the existing hydraulic capacity of the PTH 11 crossing. The culvert was shown to meet Manitoba Infrastructure's criteria for clearance but does not meet the criteria for headloss and the fish passage requirements for existing hydraulic conditions during the 2% flood and 3dQ10 flows.

Baseline surface water samples were collected on June 3 and 4, 2020 from six locations within the sub-area as well as at downstream areas as shown in Figure 4. Sample locations included the two small lakes within the sub-area (EG-1 and EG-3), the flooded grassy area north-east of the sub-area (EG-5), two locations within the peat (EG-2 and EG-4), and at the downstream end of the existing outlet ditch which drains the Evergreen 2 and 3 sub-areas (EG-6; Figure 4). Water sampling locations within the peat were determined in the field based on available water and are representative of the perched groundwater table in the peat layer (e.g. Photo 8; Appendix B). As part of the Quality Assurance / Quality Control (QA/QC), one duplicate sample and one field blank was also collected and analyzed. All laboratory samples were submitted to Bureau Veritas Laboratories (BV Labs), an accredited laboratory in Winnipeg.

In-situ field measurements of general water quality parameters (dissolved oxygen (DO), temperature, pH, conductivity and turbidity) were recorded as part of the baseline sampling program and are summarized in Table 3. Water samples were collected for laboratory analysis of general surface water quality parameters (Table 4) and metals (Table 5) and compared to the Manitoba Water Quality Standards, Objectives and Guidelines (MWQSOG) and the Canadian Council of Ministers of the Environment (CCME) – Canadian Environmental Quality Guidelines for the Protection of Freshwater Aquatic Life. These baseline water quality results will form a baseline for comparison of any future surface water sampling at the Evergreen 1 sub-area.

Baseline surface water samples collected from the peat water at the Evergreen 1 sub-area (EG-2 and EG-4) had acidic pH levels of 2.96 and 4.61, respectively (Table 3). The two small lakes within the sub-area (EG-1 and EG-3) and the flooded grassy area north-east of the sub-are (EG-5) also had slightly acidic pH values of 5.76, 6.32 and 6.36, respectively. These pH levels are below the MWQSOG and the CCME Canadian Environmental Quality Guidelines for the Protection of Freshwater Aquatic Life which is between 6.5 and 9.0. In comparison, the water within the outlet ditch (EG-6) was within the criteria and not acidic with a pH value of 7.58.

Dissolved oxygen levels were low at each of the peat sample locations (EG-2 and EG-4) as well as the south lake (EG-1) and the flooded grassy area north (EG-5) with values of ranging from 2.66 mg/L to 5.08 mg/L. These values do not meet the minimum required to satisfy the MWQSOG and CCME Cold Water Life criteria for "early life stages" (<9.5 mg/L) and for "other life stages" (<6.5 mg/L) (Table 3). Dissolved oxygen values were higher and met the criteria at the north lake (EG-3) and the outlet ditch (EG-6) with values from 8.23 mg/L to 10.16 mg/L.

Specific conductance and turbidity values were relatively low throughout, however each were slightly higher at the outlet ditch (EG-6). This may be due to ditch maintenance activities that occurred upstream of the sample location earlier in the day.

In general, nutrient values are low, often below laboratory detection limits (Table 4). No guideline exceedances of nutrient parameters were recorded. Metals analysis shows levels of aluminum above guideline values at all sample locations and levels of iron above guideline values at both of the lakes, one of the peat samples and in the outlet ditch (EG-1, EG-2, EG-3, and EG-6; Table 5). Exceedances of aluminum and iron have been routinely observed in other bog areas (e.g. KGS Group 2010a, KGS Group 2010b). Other metal concentrations were below guideline values, and often below laboratory detection limits.

4.1.7 VEGETATION

Wetlands are considered one of the most productive ecosystems, sustaining more life than any other ecosystem. Wetlands in Canada developed following the most recent retreat of glacial ice and are typically between 5,000 and 10,000 years old. According to the Conference on Wetlands Stewardship (Daigle and Gautreau-Daugle, 2001; Gautreau-Daigle, 1990), Canada has more than 150 million ha of wetlands covering approximately 15% of Canada's land area in fifteen different ecozones. Canada has 25% of the world's wetlands, covering 6% of the earth's land and freshwater surface (Daigle and Gautreau-Daigle, 2001; Warner and Rubec, 1997).

Vegetation in the Stead Ecodistrict varies based on soil type and drainage. Areas with poorly drained clayey soils consist of meadows and grasslands with sedges and grass species. These areas have predominantly been converted to agricultural crops. Extensive areas of fen peatlands and bog peatlands are present within the ecodistrict which generally consists of black spruce, tamarack, shrubs, sedges and moss vegetation (Smith et al., 1998).

The proposed harvesting area would be classified as a bog. Bogs generally receive all of their water and nutrients from precipitation (termed ombrotrophic), rather than from groundwater, and are thus mineral-poor. A bog is characteristically acidic with the water table at or near the surface (perched). Bogs typically have a dense layer of peat covered with moss, shrubs and sedges, while trees are also common. Typical vegetation dominating bog peatlands are stunted black spruce, *Sphagnum* moss and ericaceous shrubs (Warner and Rubec, 1997; Daigle and Gautreau-Daigle, 2001). The Evergreen 1 sub-area can be described as a moderately treed bog area with open areas of *Sphagnum* moss (Photo 9; Appendix B).

The Manitoba Conservation Data Center (MBCDC) lists over 3,000 vegetation species within Manitoba, with 126 species of conservation concern potentially present within the Lake of the Woods Ecoregion (Appendix D). To provide more site specific information, the MBCDC was contacted to review the rare species database for occurrences of species of concern within the project site and within a 2 km radius of the project site. Currently there are no occurrences of vegetative species of conservation concern listed within the MBCDC database at the project site or within a 2 km radius of the project site. Several species were identified as being present within the general area and in apparently similar habitats (Appendix E). These vegetation species and their associated provincial ranking include:

- smooth twig-rush (*Cladium mariscoides*; S2S3)
- white beakrush (*Rhynchospora alba*, S3)

- low spikemoss (Selaginella selaginoides, S3S4)
- large-leaved pondweed (Potamogeton amplifolius, S3)
- ram's-head lady's slipper (Cypripedium arietinum, S2S3)

None of these species are protected by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the *Species at Risk Act* (SARA), or *The Endangered Species and Ecosystems Act* (ESEA) of Manitoba. The absence of a rare plant in the MBCDC database does not necessarily mean a lack of that plant in the region. This may be related to a lack of botanical surveys conducted in the area.

Vegetation surveys were conducted at the Evergreen 1 sub-area during two site visits along transects established throughout the project study area (Figure 4). Vegetation surveys were conducted by qualified and experienced personnel following established and previously used methodology from the Saskatchewan Species Detection Protocol for Rare Vascular Plants (Government of Saskatchewan, 2017). Prior to conducting surveys, additional information about rare species identified through desktop investigations was gathered in order to become familiar with species habitat preferences and key characteristics to ensure proper identification. Surveys were conducted in late spring (June 16-19, 2020) and mid-late summer (August 21-22, 2020) to maximize the chance of species identification by coinciding with early and late blooming species. Transects were identified by examining aerial imagery and topographic maps in order to ensure that all vegetation communities within proposed harvest area as well as potential donor sites were visited. Transects were 200 m in length and spaced out from other transects to maximize spatial coverage. A total of 11 transects were surveyed as shown in Figure 4. In addition to completing surveys along the transects visited, surveyors were also observing for plant species while navigating between transects.

During the vegetation surveys a total of 92 plant species were observed within the Evergreen 1 sub-area (Table 6). Most of the species documented are provincially ranked as S5 (secure) or S4 (apparently secure).Three S3S4 (vulnerable/apparently secure) were identified, including stemless lady's slipper (*Cypripedium acaule*), blueflag (*Iris versicolor*) and small yellow pond-lily (*Nuphar microphylla*). None of the plant species observed are listed or protected by the COSEWIC, SARA, or ESEA. No provincial species of conservation concern were observed.

4.1.8 MAMMALS/HABITAT

The Lake of the Woods Ecoregion is habitat to a diversity of wildlife including black bear, moose, white-tailed deer, wolf, lynx and snowshoe hare (Smith et al., 1998). Bogs provide habitat to species such as muskrat, beaver, moose, deer, and small rodents, however mammal diversity within bogs is generally low (Daigle and Gautreau-Daigle, 2001; Rochefort et al., 2012).

The MBCDC lists 102 mammal species as being potentially present in Manitoba. Within the Lake of the Woods Ecoregion, the MBCDC lists a single mammal species as a species of conservation concern: the star-nosed mole (*Condylura cristata*) which is provincially ranked as S3 (vulnerable), however it is not listed under COSEWIC, SARA, or ESEA (Appendix D). The MBCDC was contacted to request a list of wildlife species of concern located within the project study area. Currently the MBCDC has no recordings of wildlife species of conservation concern within the project study area (Appendix E). The absence of a rare mammals in the MBCDC database does not necessarily mean a lack of that mammal in the region. This may be related to a lack of surveys conducted in the area.

Mammal surveys were conducted by qualified and experienced personnel in parallel with the vegetation surveys, bird surveys and amphibian surveys throughout the Evergreen 1 sub-area (Figure 4). Surveyors observed for animals or animal signs while walking the vegetation transects as well as all travel between transects. All land-types present were surveyed. The presence of a species was recorded if an animal was observed, tracks or scat were identified, it was heard or other clear signs were observed (beds, foraging sign, rubs, etc.).

Mammal surveys identified the presence of seven mammal species within the sub-area, including beaver, black bear, coyote, elk, grey wolf, moose, river otter, red squirrel, and white tailed deer (Table 7). All of the mammal species identified are provincially listed as secure (S5). None of these species are protected by COSEWIC, SARA, or ESEA.

4.1.9 BIRDS/HABITAT

The Lake of the Woods Ecoregion provides habitat for various bird species such as ruffed grouse, woodpeckers, bald eagle, turkey vulture, as well as many waterfowl and songbird species (Smith et al., 1998). The MBCDC website identifies over 400 bird species that are present in Manitoba. Within the Lake of the Woods Ecoregion, the MBCDC lists 25 bird species of conservation concern (Appendix D). A request was submitted to the MBCDC to search the rare species database for records of rare species near the project location. The MBCDC database indicates that one bird species of conservation concern has been recorded within 2 km of the project site and a second species has been recorded in the general area within apparently similar habitat. The eastern wood pewee (*Conypus virens*; S3B) has been recorded within 2 km of the project location and is a species of Special Concern under COSEWIC and SARA. The eastern whip-poor-will (*Antrostomus vociferous*; S2S3) has been recorded in the general area and is listed as Threatened under COEWIC, SARA, and ESEA. Both species are discussed below.

Bird surveys were conducted at the Evergreen 1 sub-area following established survey methodology from the Saskatchewan Forest Bird Survey Protocol (Saskatchewan Ministry of Environment, 2014a). Two bird surveys were conducted, with the first survey on June 5 and 9 and the second survey on June 18 and 19. A total of 11 locations were selected as bird listening stations (Figure 4). Incidental observations were also recorded while conducting other fieldwork within the sub-area. A total of 34 bird species were recorded within the Evergreen 1 sub-area (Table 7). All bird species recorded are provincially secure (S5) or apparently secure (S4). The rusty blackbird (*Euphagus carolinus*; S4B) was encountered and is listed as a species of Special Concern under COSEWIC and SARA, as discussed below.

The eastern wood pewee (*Conypus virens*) was not documented within the sub-area however has been recorded within 2 km of the site. While it is globally secure (G5), it is provincially rare to uncommon for its breeding population (S3B). It is listed as a species of Special Concern under COSEWIC and SARA but is not listed under ESEA. It is also protected under the *Migratory Birds Convention Act*. The eastern wood pewee is a small greyish-olive songbird which is common and widespread during the breeding season from Saskatchewan to the Maritime Provinces and south to Texas. It overwinters in South America. Its breeding habitat includes forest clearings and edges of deciduous and mixed forests. The population of the eastern wood pewee has declined however limiting factors are not clearly understood. Possible threats are thought to include loss and/or degradation of breeding habitat due to urban development and forest management, loss and/or degradation of habitat in winter grounds, a reduction in insect prey due to unknown reasons,

high rates of mortality during migration and/or in winter grounds, an increase in nest predation, and changes in forest structure due to white-tailed deer overbrowsing (COSEWIC, 2012).

The eastern whip-poor-will (*Antrostomus vociferous*) was not documented within the sub-area and unlikely to use the site, however it has been recorded in the general area. It is provincially imperilled to vulnerable (S2S3) and is listed as Threatened under COEWIC, SARA, and ESEA. It is also protected under the *Migratory Birds Convention Act*. Globally it is listed as secure (G5). They are a medium-sized nocturnal insect-eating bird with a large head, large eyes and a small bill with a large mouth ringed with long fine feathers which serve as sensory bristles and aid in capturing flying insects (Environment Canada, 2015a). In Canada they can be found in the southern parts of Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia and Prince Edward Island. Eastern whip-poor-wills nest in semi-open forests or patchy forests with clearings (e.g. barrens and regenerating forests following major disturbance). Common tree associations are pine and oak, which are generally not present within the sub-area. Breeding habitat is also thought to require ground-level vegetation and nearby shrubby pastures or wetlands. It is not well understood why their population is declining, but main threats include decreased insect prey availability, agricultural expansion and intensification, urban expansion, energy development and mineral extraction (Environment Canada, 2015a).

The rusty blackbird (*Euphagus carolinus*) was documented in the sub-area and is listed as a species of Special Concern under COSEWIC and SARA. It is provincially apparently secure (S4B) and is not listed under ESEA or the *Migratory Birds Convention Act*. The rusty blackbird has a breeding range of 7.6 million km^2, including most Canadian provinces and territories, the state of Alaska, several Great Lakes states and most New England states. The breeding habitat corresponds closely to the boreal forest. Within this biome, its habitat is characterized by forest wetlands, such as slow-moving streams, peat bogs, sedge meadows, marshes, swamps, beaver ponds and pasture edges. In winter, it occurs primarily in damp woodlands and cultivated fields. Limiting factors for the species include habitat loss, particularly the conversion of wetland in the Mississippi Valley flood plain forests for agriculture and urban development as well as bird control programs in the southeastern United States (COSEWIC, 2017). Habitat preferred by the rusty blackbird exists in the regional area and the species may be present; however, the project is unlikely to affect that habitat or otherwise contribute to limiting factors on the species.

4.1.10 AQUATIC BIOTA/HABITAT

Aquatic biota and habitat, particularly fish and fish habitat are protected under the *Fisheries Act*. The Evergreen 1 sub-area contains two small lakes which are only accessible by walking through the forest. Other water immediately nearby includes the flooded grassy area north-east of the sub-area and the drainage ditch from the Evergreen 2 and 3 sub-areas. The MBCDC identifies the presence of 95 fish species in Manitoba. Three species of conservation concern are noted to be present within the Lake of the Woods Ecoregion (shortjaw cisco, banded killifish and carmine shiner) (Appendix D). A request was submitted to the MBCDC to search for recordings of species of conservation concern, however no aquatic species of conservation have been documented at or near the project site (Appendix E).

A fish and fish habitat assessment was conducted on June 3-4, 2020 at three locations within, and immediately adjacent to, the Evergreen 1 sub-area. Sample sites included the two lakes within the sub-area (EG-01 and EG-03) and one potential stream site north-east of the sub-area (EG-05). Lakes were accessed

from shore only and, consequently, habitat assessments and fish collections were restricted to nearshore areas that could be accessed by wading.

EG-01 is a small circular bog lake with a diameter of approximately 250 m. Terrestrial and riparian areas surrounding the lake consist of a mix of tamarack, black spruce, small shrubs and grasses. The shoreline at EG-01 is fairly homogenous and is composed of floating peat bog/sphagnum (Photo 6; Appendix B). The water is slightly turbid and water depth was greater than 2.0 m in some areas along the shore. Aquatic vegetation consisted primarily of lily pads and emergent vegetation and grasses. Substrate consisted of a thick layer of soft organic matter. Some areas with woody debris were present but very little over-hanging cover for fish was observed. Three central mudminnow (*Umbra limi*; Photo 10; Appendix B) were captured in five minnow traps set overnight in the lake (Table 8; Appendix B).

EG-03 is a slightly larger circular bog lake with a diameter of approximately 300 m. Terrestrial and riparian areas surrounding the lake differ slightly from EG-01, and consist of shrubs and black spruce with small areas of tamarack or grassy shoreline. The shoreline at EG-03 is heterogenous with habitat changing from shrubs and overhanging vegetation to marshy habitat with cattails and dense aquatic beds of aquatic vegetation. The variety in habitat and riparian cover provides better cover for fish (Photo 7; Appendix B). Water depth was greater than 2.0 m in some areas along the shores, and water in the lake was slightly turbid at the time of the site visit. Substrate consisted of a thick layer of soft organic matter throughout the perimeter of the lake. In-water habitat features consisted of small lily pads, some emergent vegetation and woody debris. Three central mudminnow, 29 brook stickleback (*Culaea inconstans*; Photo 11; Appendix B) and one northern redbelly dace (*Chrosomus eos*; Photo 12; Appendix B) were caught in five minnow traps set around the perimeter of EG-03 (Table 8).

The habitat at EG-05 consisted of a low lying flooded grassy area with a small central channel but no observable flow (Photo 13; Appendix B). Terrestrial and riparian areas surrounding the channel consisted of deciduous trees, shrubs and grasses. Aquatic habitat at the site was suitable for small-bodied fish species although no upstream or downstream connectivity was apparent. Substrate was primarily aquatic vegetation and organics; a maximum water depth of 1.0 m was recorded. Fish capture attempts at this site included backpack electrofishing and seine net sweeps, however, no fish were observed or captured.

Several schools of small forage fish were observed during water quality sampling at the outlet ditch (EG-6). Several pearl dace (*Margariscus margarita*) were caught from the ditch (Photo 14; Appendix B). The ditch did not appear to have any connectivity to any of the waterbodies previously sampled for fish.

Both EG-01 and EG-03 appear to have no connectivity to other waterbodies, suggesting that the three species captured (central mudminnow, brook stickleback and northern redbelly dace) were year-round residents in the lakes. Although fish residing in the lakes may be susceptible to winter kill in some years due to low oxygen conditions, the capture of adult small bodied fish during the limited fishing conducted in 2020 suggests that the lakes provide the necessary habitat for all life history requirements (spawning, rearing, and overwintering) for the species captured. It is possible that other small bodied species that are tolerant of stagnant, low oxygen concentration conditions typical of peat/bog lakes may also occur in EG-01 or EG-03. It is not known whether large-bodied fish occur in the lakes.

All forage fish species encountered are provincially secure (S5) and are not listed under COSEWIC, SARA or ESEA. None of the species of conservation concern within the ecoregion were observed.

4.1.11 AMPHIBIANS AND REPTILES

A total of 17 amphibians and 13 reptile species are listed by MBCDC as being present in Manitoba. Within the Lake of the Woods Ecoregion, MBCDC notes the present of four amphibian species of conservation concern (eastern tiger salamander, green frog, northern leopard frog, mink frog) and two reptile species of conservation concern (snapping turtle, eastern garter snake) (Appendix D). A request was submitted to the MBCDC to search for occurrences of species of conservation concern near the project site. No amphibian or reptile species of conservation concern have been documented within 2 km of the project site however MBCDC noted that the northern redbelly snake (*Storeria occipitomaculata*; S3S4) and snake hibernaculum(s) have been recorded in the general area in apparently similar habitat (Appendix E). The northern redbelly snake is not listed under COSEWIC, SARA or ESEA.

Amphibian surveys were conducted by qualified and experienced personnel following established survey methodology from the Saskatchewan Amphibian Auditory Survey Protocol (Saskatchewan Ministry of Environment, 2014b). Two amphibian surveys were conducted, with the first survey on June 3 and the second survey on June 16. A total of four locations were selected as amphibian listening stations (Figure 4). Incidental observations were also recorded while conducting other fieldwork within the sub-area. A total of four amphibian species were recorded within the Evergreen 1 sub-area (Table 7). All amphibian species recorded are provincially secure (S5) or apparently secure (S4). None of the species of conservation concern within the ecoregion were observed, with the exception of the northern leopard frog (*Lithobates pipiens*; S4B) which is listed as a species of Special Concern under COSEWIC and SARA.

The northern leopard frog (*Lithobates pipiens*) was documented within the sub-area and is listed as a species of Special Concern under COSEWIC and SARA. It is provincially apparently secure (S4B) and is not listed under ESEA. It remains widespread but has experienced a considerable contraction of range and the loss of populations in the past, particularly in the west (Environment Canada, 2013). The northern leopard frog requires three distinct habitats in close proximity to meet their seasonal needs. In the winter they hibernate in oxygenated water bodies that do not completely freeze solid. During the spring breeding period they inhabit shallow warm waters in marshes, ditches, lake margins, and slow moving creeks. In the summer they inhabit riparian and upland habitats, including moist meadows, pastures, scrubland, riparian corridors, and drainage and irrigation ditches (Environment Canada, 2013). Threats to the northern leopard frog include habitat loss, degradation and fragmentation, particularly due to wetland drainage for agriculture, habitat conversion and fragmentation due to human activities such as cultivation and highways, habitat loss due to urbanization and industrialization, trampling from cattle grazing, alteration of water regimes that create strong currents, introduction of disease, environmental contaminants, fish stocking, road traffic mortality, and commercial harvesting and collecting. While the proposed harvesting project will alter the existing bog area; as noted above, the 100 m buffer around waterbodies will provide a substantial area of habitat with emergent vegetation along the shorelines which should mitigate any potential effects of the project on the northern leopard frog.

4.2 Socioeconomic

4.2.1 COMMUNITIES

The proposed peat harvesting at Evergreen 1 sub-area is located on remote Crown land and there are no communities present within the 3 km project study area. The regional study areas fall within the R.M.s of Lac du Bonnet (north of PTH 44) and Reynolds (south of PTH 44). The only community within the 10 km regional study area is Seddons Corner. Other communities shown on maps within the regional study area including Siegs Corner, Brookfield and Milner Ridge appear to consist of single residences. Larger communities present outside of the regional study area include Beausejour (21 km west), Seven Sisters (11 km east), and Lac du Bonnet (17 km north-east) (Figure 1).

4.2.2 INDIGENOUS

There are no Indigenous communities located in the project or regional study areas. Indigenous communities located within 100 km of the study area include the Brokenhead Ojibway Nation (located 34 km north-west), Peguis First Nation (which has a parcel of land 44 km west), Sagkeeng First Nation (located 50 km north), Black River First Nation (located 80 km north), Shoal Lake 40 First Nation (located 85 km south-east) and Wabaseemoong Independent Nation (located 81 km east). The Evergreen 1 sub-area is located within the Recognized Metis Harvesting Area.

First Nation and Metis communities may have interest in the proposed project based on their proximity to the proposed harvesting site and possible traditional land use (TLU) in the area. All of the Indigenous communities identified within 100 km of the sub-area have been approached about the proposed project through the project's Indigenous and Public Engagement Program (see Section 3.0).

4.2.3 ECONOMY

The economic base in the region includes agriculture, hydroelectric generation, mining, forestry and tourism. Sources of income in 2016 within the R.M.s of Lac du Bonnet and Reynolds include: employment income (61.7% to 72.2%) and government transfer payments (14.4% to 16.6%) (Statistics Canada, 2017a, 2017b). The median after tax income for a person 15 years or older who worked a full year at full time was $27,878 to $32,269 while the average household income was $53,824 to $62,950 (Statistics Canada, 2017a, 2017b).

In the R.M. of Lac du Bonnet there were 2,460 people over the age of 15 in 2016, with 1,400 in the labour force. Of those in the labour force, 1,310 were employed and 90 were unemployed, resulting in an unemployment rate of 6.4% (Statistics Canada, 2017a). Of the 1,400 people in the labour force, the main occupational categories include public administration (180 people; 13%), health care and social assistance (165 people; 12%), construction (160 people; 11%) and retail trade (160 people; 11%) (Statistics Canada, 2017a). Other employment industry categories accounted for the remaining 53% of the jobs in the R.M. of Lac du Bonnet (Statistics, Canada 2017a).

In the R.M. of Reynolds there were 1,105 people over the age of 15 in 2016, with 705 in the labour force. Of those in the labour force, 640 were employed and 65 were unemployed, resulting in an unemployment rate of 9.2% (Statistics Canada, 2017b). Of the 705 people in the labour force, the main occupational categories include trades, transport and equipment operators and related occupations (255 people; 36%), sales and

service (95 people; 13%), management occupations (85 people; 12%) and business, finance and administration (65 people; 9%) (Statistics Canada, 2017b). Other employment industry categories accounted for the remaining 30% of the jobs in the R.M. of Reynolds (Statistics, Canada 2017b).

4.2.4 POPULATION

As previously noted, the Evergreen 1 sub-area is located in the R.M. of Lac du Bonnet, with the regional study area also overlapping with the R.M. of Reynolds. Population statistics for both R.M.s is presented in Table 9. Population statistics for the small towns within the regional study area were not available. The nearest larger communities outside of the regional study area include Beausejour and Lac du Bonnet, for which population statistics are also presented in Table 9.

TABLE 9: POPULATION STATISTICS FOR NEARBY COMMUNITIES

Population / Dwelling Information	RM of Lac du Bonnet	RM of Reynolds	Town of Lac du Bonnet	Town of Beausejour
Population in 2011	2,930	1,284	1,069	3,126
Population in 2016	3,121	1,338	1,089	3,219
2011 to 2016 Population Change (%)	6.5	4.1	1.9	3.0
Total Private Dwellings	2,684	727	582	1,518
Population Density per km^2	2.8	0.4	506.6	593.8
Land Area (km^2)	1,100.98	3,572.13	2.15	5.42

(Source: Statistics Canada, 2017a; Statistics Canada, 2017b; Statistics Canada, 2017c; Statistics Canada, 2017d)

Population information for Indigenous communities located within 100 km of Evergreen 1 sub-area is presented in Table 10.

TABLE 10: POPULATION STATISTICS FOR SURROUNDING INDIGENOUS COMMUNITIES

Community	On Own Reserve	On Other Reserve	Off Reserve	Total
Brokenhead Ojibway Nation	790	11	1,323	2,124
Peguis First Nation	3,598	128	6,828	10,554
Shoal Lake No. 40	293	13	356	662
Wabaseemoong Independent Nations	988	10	987	1,985
Sagkeeng Anicinabe (Fort Alexander First Nation)	3,589	44	4,514	8,147

Community	On Own Reserve	On Other Reserve	Off Reserve	Total
Black River First Nation	984	18	455	1,457

(Source: Indigenous and Northern Affairs Canada, 2020)

Notes:

1. On Reserve counts include "On Reserve" and on "Own Band Crown Land."
2. Off Reserve counts include those people living on "Other Band Crown Land," "No Band Crown Land" and "Off Reserve".

4.2.5 SERVICES

The Evergreen 1 sub-area is located north of PTH 44 approximately 60 km northeast of Winnipeg. Within the regional study area, Seddons Corner has a service station (gas and food) at the intersection of PTH #44 and PTH #214 (Milner Ridge Road). Other services within the regional study are limited, including a correctional facility, gravel pits, a granite quarry, and snowmobile and ATV trails. Just outside of this area, both Beausejour to the west and Lac du Bonnet to the north-east have amenities such as stores, post office, hotels, recreation complexes, churches, and schools.

The Royal Canadian Mounted Police provides law enforcement services to the communities located in the area with the nearest detachments being in Beausejour and Lac du Bonnet. Similarly, the nearest fire departments are situation in Beausejour and Lac du Bonnet. The nearest hospital to the proposed project is in Beausejour, while Lac du Bonnet also has a Health Centre.

4.2.6 LAND USE

Land use within the regional study area includes a mixture of resource extraction and recreation including agriculture, forestry, hunting, and off-road vehicle use (snowmobiles and ATVs).

4.2.6.1 Agriculture

Agriculture within the Lake of the Woods Ecoregion is limited to relatively small areas of arable land in the lowlands near creeks and rivers where drainage has been improved. Constraints include the presence of dense subsoils which are poorly drained with poor nutrient retention and poor water holding capacity (Smith et al., 1998). Agricultural activity is present at the western and eastern limits of the regional study area outside of the Agassiz Provincial Forest (Figure 1).

4.2.6.2 Forestry

Based on aerial imagery of the regional study area there is evidence that commercial forestry occurs throughout the Agassiz Provincial Forest, including within the project study area and regional study area. Based on the small size of trees typically found within peat bogs, it is likely that limited amounts of merchantable timber would be present within the 60 ha area to be harvested. Sun Gro will contact the regional forestry office regarding timber removal at the site.

4.2.6.3 Hunting, Fishing and Trapping

The Evergreen 1 sub-area is within Manitoba Game Hunting Area (GHA) #34, which has hunting seasons for white-tailed deer, black bear, grey wolf, upland game birds and migratory game birds (Government of Manitoba, 2019a). The regional study area also extends into GHA #35 to the south. The Evergreen 1 sub-area

is on Crown land within the Agassiz Provincial Forest where the public is permitted to hunt. Most hunting seasons are in the fall and early winter, however some seasons are also in the spring (i.e. bear, migratory game bird). First Nation and Metis hunters can hunt for subsistence year-round. No hunting lodges are known to be present within the regional study area.

The project regional study area is within Open Trapping Area #4 where trapping for furbearing animals such as beaver, mink, muskrat, otter, badger, fisher, red fox, coyote, lynx, bobcat, marten, raccoon, red squirrel, wolf and weasel is permitted by licenced trappers at various times between October and April (Government of Manitoba, 2019b). The extent of trapping activity within the regional study area is not known. The Manitoba Trappers Association was engaged as part of the EAP (Section 3.0).

No sport fishing activity is expected within the regional study area with the exception of the Winnipeg River at the eastern limit. The three lakes present within the region include the two lakes within the sub-area which are only accessible by walking through the forest and do not appear to contain suitable habitat for sport fish. One larger lake south-west of the sub-area also does not appear to be readily accessible. Whether this lake contains sport fish is not known.

The Brokenhead Ojibway Nation Community Interest Zone (CIZ) is located within the regional study area approximately 3 km north-west of the Evergreen 1 sub-area. CIZs are areas of protection within 30 km adjacent to First Nation reserves. Their intent is to protect the area from development while a First Nation undergoes Treaty Land Entitlement (Manitoba TLE Framework Agreement, 1997).

4.2.6.4 Parks, Recreation and Snowmobiling

No federal parks are located within the regional study area. The Pinawa Provincial Park and Whitemouth Falls Provincial Park are located just within the eastern extent of the regional study area (Figure 1). The Evergreen 1 sub-area is within the Agassiz Provincial Forest. Sustainable use of natural resources is permitted in provincial forests under *The Forest Act* (Manitoba).

Snowmobile trails are present within the project study area and are maintained by the Eastman SnoPals Snowmobile Club. The nearest trail follows the Agassiz Road (PR #761) approximately 400 m north-west of the sub-area (SnoMan, 2020).

The region also appears to be used for recreational ATV riding however no ATV clubs appear to maintain trails within the regional study area (ATVMB, 2020). It is likely that trails used for snowmobiles in the winter are used by ATVs in other seasons.

4.2.7 AREAS OF INTEREST

Several Areas of Special Interest (ASIs) are present within the local and regional study areas. The Milner Ridge East ASI (ASI #34) is located immediately east of the Evergreen 1 sub-area. It is 1,306 ha in size and includes a large bog complex. The Seddons Corner ASI (ASI #33) is situated approximately 1.3 km west of the Evergreen 1 sub-area. It is 1,211 ha in size and appears to include primarily forested uplands. Other ASIs within the regional study area include the two parcels of the Milner Ridge North ASI (ASIs #35 and #36) which are 1,178 ha and 382 ha respectively. These are located approximately 6 km west of the sub-area on the west side of Milner Ridge Road and appear to consist of a mixture of upland and lowland forest areas. ASIs are not legally designated or protected (Government of Manitoba, 2020).

4.2.8 HERITAGE RESOURCES

Heritage resources are protected in Manitoba under *The Heritage Resources Act*. The Manitoba Historic Resources Branch of Manitoba Culture, Heritage and Tourism has reviewed the proposed project development area for Evergreen 1 sub-area, and has indicated a low potential to impact significant resources. Therefore, the Historic Resources Branch has no concerns with the project (Appendix E). In the event that heritage resources are discovered, construction will cease and the Historic Resources Branch will be notified immediately, with further construction occurring only as directed by the Historic Resources Branch.

5.0 ENVIRONMENTAL EFFECT ANALYSIS

5.1 Environmental Assessment Methods

The environmental assessment of the proposed peat development was carried out based on project information provided by Sun Gro and in accordance with the Manitoba *Environment Act Proposal Report Guidelines* (Manitoba Sustainable Development, 2018b). Additional information was acquired from literature and internet searches, publications by the peat industry and environmental organizations; contacts with provincial government representatives; engagement with stakeholders; and site investigations by the project team. Requirements of *The Environment Act* (Manitoba) and regulations were followed in the preparation of this EAP.

The environmental effects of the proposed peat harvesting project on the environment in the project and regional study areas were identified using checklists and professional judgment. Advice by government representatives, concerns expressed by the stakeholders, and brainstorming among the consultant team was also used to identify environmental issues and associated environmental effects. The adversity of environmental effects was determined based on categories presented in Table 11.

The significance of the residual environmental effects of the proposed peat harvesting operation were evaluated following industry best practice. The degree of change from the existing conditions and the value of the environmental components being affected determine significance of an adverse effect. Criterion for this determination as referenced in Table 12 include: a) Societal value of affected environmental components, b) Ecological value or sensitivity of affected environmental components, c) Duration, d) Frequency, e) Geographic extent, f) Magnitude, and g) Reversibility. For each criterion a particular level of significance rating (1, 2 or 3) is assigned. To judge the overall significance of an effect, the rating and criteria should be considered together. An effect is determined significant when: (1) it rates a “3” for at least four criteria, at least one of which must be criteria a or b; or (2) it is rated “2” or “3” for all criteria.

5.2 Environmental Issues

Potential environmental issues associated with the project were identified by considering the nature of the project, the location, and environmental effects typical of peat harvesting projects. Site specific environmental issues will be discussed in a regional context.

5.2.1 LOSS OF WETLAND

Public concern exists regarding the loss of wetlands as a function of wildlife habitat and other ecological functions. This is due to land use changes such as urban development, increased population and in particular agricultural development, especially in the prairie regions of Canada, where there are fewer wetlands remaining (Rubec, 2003). Many wetland areas have been lost due to draining for agricultural land use. Overall, development has accounted for approximately 15% loss of Canadian wetlands (Smith et al., 1998). Horticultural peat harvesting, in comparison, only accounts for 0.02% (17,000 ha) of Canada’s total peatland area (Daigle and Gautreau-Daigle, 2001; Rubec. 1996). Additionally, the CSPMA has research from peatland

restoration activities showing that a functioning wetland ecosystem can be restored within 5 to 7 years following completion of restoration.

5.2.2 LOSS OF WILDLIFE HABITAT

Loss of wildlife habitat, particularly waterfowl nesting areas, is another concern. Waterfowl and other wildlife species favour swamps, marshes and shallow open water wetland classes as habitat due to the diverse range of vegetation. In contrast, bogs and fens have limited importance as habitat for waterfowl and some wildlife species because they tend to have very little open water (Gautreau-Daigle, 1990), low diversity of vegetation and limited cover for waterfowl or other bird nesting purposes. An evaluation of waterfowl use of bog areas found that some waterfowl use ponds within bogs for staging and migration. Usage was directly related to the availability of open water in the area and little difference was noted between developed and undeveloped areas (Gautreau-Daigle, 1990). The number of waterfowl and wildlife species and the total wildlife populations in bogs and fens are generally lower in comparison to other wetland classes or to mineral soil ecosystems.

Mammal species such as muskrat and beaver and game species such as woodland caribou, moose and deer utilize peatland habitat. Overall, wildlife diversity within bogs is low due to low vegetation productivity of the bog habitat with little variation in populations noted between the natural and disturbed areas (Gautreau-Daigle, 1990). Moose populations have been shown to use bog areas, but no population differences were observed between harvested and unharvested bogs (Gautreau-Daigle, 1990).

5.2.3 LOSS OF RARE VEGETATION SPECIES

Protecting rare or endangered species and other vegetation is a concern in regard to peat harvesting projects. Peat harvesting affects vegetation that is unique to peatland bog environments such as pitcher plants (*Sarracenia* spp.), bladderworts (*Utricularia* spp.) and sundews (*Drosera* spp.) that are not found in other mineral soil environments. These types of species occupy a niche that few other species are suited to and are found in many bog ecosystems. Many of these species are widely distributed throughout Canada's boreal wetland regions. Several orchid species, some of which are rare, also occur in peatland environments (Daigle and Gautreau-Daigle, 2001).

The composition of vegetation in bogs tends to have a typical association of species adapted to the regional conditions. As such, the potential effects of a peat harvesting project will depend on the regional environment. If there is a large area of undisturbed bog in the region that will still support the unique vegetation types, then harvesting a peat bog that is only a small portion of the area will have minimal effects on rare vegetative species.

5.2.4 RELEASE OF GREENHOUSE GASSES

The release of greenhouse gas (GHG) emissions associated with peat harvesting is another environmental concern. As *Sphagnum* grows, carbon is stored in the plant material. The plant material accumulates as peat due to the anaerobic conditions (low oxygen levels) caused by the high water table. Land use change, particularly from undisturbed peatland (which typically has a high water table and full vegetation cover) to peatland under extraction (which has a reduced water table and no vegetation cover), results in a net increase in GHG emissions (Cleary et al., 2005). The net increase is caused by an increase in the rate of in-situ

decomposition through increased diffusion of oxygen, increased carbon dioxide (CO_2) emissions, and a reduction of ecosystem production resulting through the removal of living biomass from the peatland surface.

Research by Cleary et al. (2005) described the net GHG emissions from the Canadian peat industry and established a formula for estimating the GHG emissions from land use change, which includes a value for the standard flux of GHG per unit area within peatland under extraction (1,061 t/km^2/yr) and within cutover peatland under restoration (1,288 t/km^2/yr) (Cleary et al., 1995). Other literature was also reviewed which cited similar flux rates (Environment Canada, 2015b; Maljanen, et al., 2010). Values from Cleary et al. (2005) were used as they are from Canadian peatlands, rather than European (Maljanen et al., 2010) and authors considered all GHG emissions in CO_2-equivalent (CO_2 eq.), while others focused solely only on CO_2 (Environment Canada, 2015b).

Work conducted by Waddington et al. (2010) and Strack et al. (2014) suggests that sphagnum restoration could result in a disturbed area returning to a carbon sink, during the growing season, in as little as 2-3 years post restoration. Waddington et al. (2010) state that harvested peatlands will likely return to a net carbon sink (on an annual basis) in 6 to 10 post-restoration. Environment Canada UNFCCC shows that harvested peatlands return to being a carbon sink 5 years post-restoration (Environment Canada, 2015b). Based on these studies it was assumed that the restored harvest areas become net neutral for GHG 5 years post restoration for the purposes of calculating CO_2 eq. values. The latest research indicates that the annual carbon balance returns to values comparable to the natural environment between 10 and 15 years following restoration (Waddington et al., 2010; Strack et al., 2014; Strack and Zuback, 2013; Waddington and Day, 2007).

Using the equations established by Cleary et al. (2005) incorporating peatland under extraction and cutover peatland under restoration, the total quantity of CO_2 eq. produced due to land use change throughout the 17 years of operation and 5 years post restoration was calculated to be 14,686 t - CO_2 eq. (Table 13). Cleary et al. estimated the GHG contributions from each component of the life cycle of peat harvesting where land use change accounted for 15%, peat harvesting and processing accounted for 4%, transport to market accounted for 10% and decomposition accounted for 71% (Cleary et al. 2005). However, GHG emissions from decomposition are associated with the end use and should not be attributed to the producer. Therefore, after 17 years of operation and 5 years post restoration of Sun Gro's Evergreen 1 sub-area, in addition to the 14,686 t - CO_2 eq. emitted from land use change (Table 13), the GHG emissions from peat harvesting and processing would be 3,916 t - CO_2 eq. and from transportation to market would be 9,791 t - CO_2 eq., respectively. This equates to a total GHG emission of 28,393 t - CO_2 eq. over the project lifetime and equivalent to 1,670 t - CO_2 eq/yr. The most recent available data for CO_2 emissions in Canada are for 2018, which had a total value of 7.29 x 10^8 t - CO_2 eq (729 Mt) (Environment Canada, 2020). Therefore, an average year of production at the Evergreen 1 sub-area will account for approximately 0.0002% of the total annual emissions for the country. This quantity of CO_2 eq. can be decreased by incorporating mitigation measures to minimize GHG emissions throughout the life cycle of peat harvesting.

5.2.5 IMPACTED SURFACE WATER QUALITY

Good surface water quality is valued for consumption, agriculture and recreation, and is important for migratory birds and aquatic biota. Impacts to surface water quality due to peat harvesting activities are an

environmental concern. Following the removal of surface vegetation, the exposed peat particles can be transported into the drainage system, thus increasing suspended particles and other chemical parameters (primarily pH) in the water. Management of drainage water to slow down the flow of water enabling solids to settle out of the discharge water have become an integral part of peat harvesting operations.

5.2.6 IMPACTED DRAINAGE PATTERNS

Impacts to the existing drainage pattern due to peat harvesting activities are an environmental concern. Existing culverts and the design of the proposed additional culvert for discharge beneath the access road will generally maintain existing surface drainage patterns or not cause flooding downstream. Constructed drainage at the harvesting areas will follow existing drainage patterns at the north-east side of the site where discharge will continue toward the north-east and discharge overland. As discussed in Section 2.5, the small area of surface water drainage at the south-west side of the harvest area will change direction. At present, surface water at the south-west side of the site drains toward the Brokenhead River, however the harvest area drainage plan will convey all discharge from the harvest area to the north-east. Therefore a small portion of land is now draining into a different watershed. This change in drainage pattern is negligible and will not impact downstream waterbodies (see Section 2.5 and 5.3.5).

During initial drainage and subsequent ditch deepening, there is a temporary increase in runoff, however this is over a limited period of time and well below the runoff of large rain events. Once the drainage system is constructed at the peat harvesting site, the rate of runoff is slightly delayed (lag time) during a rain event and the peak is slightly lower in magnitude (Gemtec, 1991; Northlands Associates Ltd., 1989). This appears to be due to the storage capacity of the constructed drainage and the increased absorption created by the drained peat.

5.2.7 INCREASED TRAFFIC

Transportation of peat from the harvest areas to the processing facility during operation will result in a seasonal increase in traffic volumes on roadways as described in Section 5.4.3. Increased truck traffic will increase dust, will further degrade the road requiring more frequent road maintenance and has the potential to increase the number of vehicle accidents and vehicle-wildlife interactions. The volume of increased traffic associated with this project, however, would be minor when considering other trucks that use the roads in the area. As the Evergreen 2 and 3 sub-areas are near the end of harvesting, trucks originating from these sub-areas will stop in the near future.

5.2.8 RECLAMATION AND RESTORATION

Reclamation focuses on the potential after-uses of harvested peatland sites, whereas, restoration focuses more on re-establishment of the site as a peatland, with a functional natural ecosystem with characteristics as close as possible to the pre-harvesting conditions. Though reclamation and restoration requirements for peat harvesting projects in Canada have not been clearly defined, it has become an integral part of peatland management in this country.

There are several methods for peatland reclamation such as transforming the site into a new functioning wetland that would be useful as waterfowl habitat, developing agricultural cropland or establishing a forestry plantation on site. Sun Gro proposes to restore the fully harvested areas to pre-disturbance conditions, as

Sphagnum peat bogs based on their restoration experience at other peat bogs in the area (e.g. Elma bog), and in accordance with the peatland restoration methods described in CSPMA Peatland Restoration Guide (Quinty and Rochefort, 2003). Sun Gro has developed a Peatland Recovery Plan for PHL 3 following Manitoba's Submission Guidelines for Peatland Recovery Plans - Peatland Management Guidebook (Manitoba Sustainable Development, 2017b) to fulfill the requirements of *The Peatlands Stewardship Act*. The report describes the actions Sun Gro will be taking to restore harvest areas to a peat accumulating ecosystem once harvesting is complete. Sun Gro continues to work with the Peatland Ecology Research Group (PERG) to study peat recovery as several Sun Gro sites. Research results will help inform future recovery approaches at Sun Gro sites (Vertex, 2018).

5.2.9 PEAT FIRE

The burning of peat deposits can result in smoke which may cause health concerns and traffic accidents. Fires may be started naturally or as a result of human activity. In some instances in the past, fires have been deliberately set to remove peat for cereal crop agriculture (Manitoba Clean Environment Commission, 1977). Peat fires can burn for long periods of time (months, years) propagating in a creeping fashion beneath the peat surface. Forest fires are a key element for ecosystem renewal within the boreal shield environment with fires started by lightning being the dominant disturbance (Neary et al., 2005). Without fire suppression, an area of forest burns every 50 to 100 years (Bergeron et al., 2004).

5.3 Biophysical Effects Assessment

5.3.1 MICROCLIMATE

The clearing in preparation for the proposed peatland development project will likely result in minor changes in airflow, wind speed and snow depositional pattern in and adjacent to the development area. The potential adverse effects of the project on microclimate were assessed as minor. The effects may be mitigated by installing snow fences to control snow deposition on the property if required. Follow-up involves periodic observation of the changes in airflow patterns and snow deposition. The residual effect was determined to be not significant (Table 14).

5.3.2 AIR QUALITY

Increases in fugitive dust may occur in the local area during construction and operation of the project associated with access road construction, clearing, ditching, harvesting, stockpiling, loading and transporting activities. A total of approximately 60 ha of peat will be exposed to potential wind erosion at the Evergreen 1 sub-area. Handling of peat during harvesting and loading will potentially result in fugitive dust as well as increased truck traffic along the gravel access road to the site. All highways used for hauling peat are paved. Dust is controlled as part of the routine operation and will reduce particulate matter in the air. It is unlikely that Manitoba's air quality guidelines would be exceeded during construction and operation phases of the project. The potential effects on air quality were assessed to be moderate. The effects may be mitigated by using an approved dust suppressant such as water on roads, minimizing peat harvesting and handling activities during high wind events, reducing the area of peat in fields and peat stockpiles exposed to prevailing winds, controlling vehicle speeds, instructing employees on proper harvest equipment operation to minimize dust, covering loads being hauled from the site, re-vegetating harvested areas and utilizing

windbreaks (tree and brush barriers). Proposed follow-up involves periodic observations for fugitive dust levels, inspections of local area for accumulated dust and tracking of public complaints. The residual environmental effect of increased fugitive dust during construction and operation was determined to be not significant (Table 14).

Increased levels of NO_x, SO_2 and GHGs may result from equipment and vehicle emissions during site preparation, peat harvesting and transporting activities. Additionally some construction materials and the use of fuel may release volatile organic carbons (VOCs). The potential adverse effects on air quality in the local area were assessed to be minor. Proposed mitigation measures include using low sulphur fuels, requiring a high standard of maintenance for equipment and vehicles, limiting unnecessary long-term idling and using appropriate fuel dispensing equipment. Proposed follow-up includes periodic observation of air quality during construction, recording maintenance of heavy equipment and requiring submission of Safety Data Sheets (SDSs) for all products used. Residual environmental effects of NO_x, SO_2, GHGs and VOCs on air quality were determined to be not significant (Table 14).

Increased releases of GHG into the atmosphere will result from clearing and land use change associated with peat harvesting activities. While construction of ditches reduces the release of methane, harvesting peat releases CO_2 and reduces carbon sequestering. The overall net flux, as discussed in Section 5.2.4 is an increase in GHG with an estimated release of 14,686 t - CO_2 eq. from land use change throughout the 17 years of operation and 5 years post restoration. However, this potential increase in GHG when compared to national levels is considered to be a minor effect. Mitigation measures proposed to address GHG concerns include minimizing the areas cleared and implementing the PRP activities to restore the area to a carbon sink. The proposed follow-up involves adherence to licence terms and conditions. The residual effect of increased GHGs during construction and operation was determined to be not significant (Table 14).

5.3.3 SOILS

Site preparation and peat harvesting activities will result in an average loss of 1.5 m depth of surface cover and peat; however, the actual depth of loss will vary across the site as the peat thickness is variable. The average harvesting of peat is estimated to be 850 m^3/ha/year. In 2021, the approximately 60 ha of harvestable peatland will be cleared and prepared for peat harvesting. Full peat production over the 60 ha area will continue until the end of approximately 2037 at which time the sub-area is expected to have been harvested to the final planned depth of harvesting. This removal of soil (peat) from the site through the process of harvesting was assessed to be major. Mitigation measures proposed to address the effects of soil loss include minimizing the surface area disturbed to the area being harvested, leaving non-commercial peat reserves in place, and implementing the PRP to restore the area to natural conditions. Proposed follow-up includes annual monitoring and reporting on implementation of the progressive restoration activities. The residual effect of soil loss was determined to be not significant (Table 14).

Soils in the development area may become contaminated from accidental leaks, spills and releases of fuel or other hazardous substances during site preparation and peat harvesting activities. The potential adverse effects on soil quality were assessed to be moderate. Proposed mitigation includes preventing leaks, spills and releases, requiring drip trays for equipment, designating re-fueling areas, ensuring equipment arrives to site in good condition, providing spill clean-up equipment and materials, and providing an emergency spill response plan. No fuel will be stored at the Evergreen 1 sub-area. A fuel storage tank at the existing

Evergreen staging area has previously been authorized and will continue to be used. Proposed follow-up includes periodic inspections for leaks, spills and releases, ensuring construction and operation crews adhere to designated areas, remediate and record fuel spills and releases, adherence to licence terms and conditions and periodic updates of the spill response plan (Sun Gro, 2017). The residual effect of accidental leaks, spills and releases on soil quality was determined to be not significant (Table 14).

5.3.4 GROUNDWATER

Groundwater in the harvest area may become contaminated during construction from leaks and accidental spills or releases of fuels or other hazardous substances. Groundwater quality in the development area has not been analyzed for contaminants however it is assumed to be good quality due to its remote location. Groundwater is also used as a potable water source within 3 to 5 km of the site. The low permeability clay cover on-site, as discussed in Section 4.1.4 forms a very good barrier between the perched water in the peat and the underlying local bedrock aquifer. This essentially isolates the peat from the groundwater so the proposed development will have little to no measurable effect on the groundwater table. The proposed development does not include the installation of any groundwater wells which could provide a conduit if installed incorrectly. The potential adverse effects of the project on groundwater quality were assessed to be minor. Proposed mitigation includes preventing leaks, spills and releases, providing secondary containment for any temporary fuel storage, requiring drip trays for equipment, providing spill clean-up equipment and materials, and provide an emergency spill response plan (Sun Gro, 2017). Follow-up proposed involves periodic inspections for leaks, spills and releases, remediate and record any fuel spills and releases, periodic updates of the emergency response plan and adherence to license terms and conditions. The residual effects of accidental leaks, spills and releases on groundwater quality were determined to be not significant (Table 14).

5.3.5 SURFACE WATER

While waterbodies such as the lakes within and south of the Evergreen 1 sub-area will not be disturbed, low lying areas within the harvesting area such as small intermittent ponds and drainage swales that contain water only during spring snow melt and/or when the water table is high will be lost due to site drainage for peat harvesting operations. Research has shown that ditches created in organic soils can result in water table influences between 5 m (with moderately decomposed peat) and 50 m (within less decomposed peat) from a ditch (Boelter, 1972). Approximately 60 ha (42% of the sub-area) of land will be cleared and drained within the Evergreen 1 sub-area. A 100 m buffer with no development will remain around both lakes within the sub-area. The restoration work to begin when the harvesting area is closed will result in development of wetland areas that will offset the surface water area lost during project construction. Potential adverse effects on surface waters associated with drainage for the proposed development were assessed to be moderate. Proposed mitigation includes minimizing the area disturbed, maintaining water levels on the adjacent undisturbed lands, and implementing the PRP to restore water levels to pre-harvesting conditions. Follow-up proposed includes periodic inspection of surface waters and annual reporting on implementation of the restoration activities. The residual effect of loss of surface waters was determined to be not significant (Table 14).

Site drainage activities during construction and on-going maintenance will result in changes to the flow rate and some changes to the direction of surface water runoff within the harvest area. As discussed in Section

2.5.2, the drainage plan includes draining all water within the harvest area to the north-east. This results in a change of surface water flow for a portion of the sub-area which currently drains to the south-west. A hydrologic and hydraulic impact assessment was conducted to assess potential effects of drainage to the adjacent environment, infrastructure and area. As discussed in Section 2.5.2, flow rate from the harvest area discharge was calculated to be approximately 0.12 m^3/s during the initial site drainage. All drainage from the Evergreen 1 sub-area will discharge overland north-east of the harvest area and indirectly into the Winnipeg River. Median annual flow at the downstream PTH 11 crossing was calculated to be 2.1 m^3/s (for 1 in 2 year flow events). Therefore, the project is estimated to increase downstream discharge by a maximum of 5.9% during passage of the median annual flood (1 in 2 year event) and a 1.7% increase during a 1 in 50 year flood flow. The relative increase during ditch deepening activity is smaller with a calculated discharge flow rate of 0.02 m^3/s (as discussed in Section 2.5.2). A backwater model was used to assess the potential impacts of the proposed project to the existing hydraulic capacity of the PTH 11 crossing relative to existing Manitoba Infrastructure design criteria for hydraulic structures. Although the results showed that the existing PTH 11 crossing does not meet provincial criteria, the water levels upstream of the crossing would only increase by a maximum of 0.02 m as a result of the project, with a corresponding increase in average flow velocity of 0.02 m/s. On this basis, the effects of the project to the capacity of the existing crossing at PTH 11 is considered to be negligible. As noted in Section 5.2.6, once the drainage system is constructed at the peat harvesting site, the rate of runoff is slightly delayed (lag time) during a rain event and the peak is slightly lower in magnitude compared to natural drainage conditions (Gemtec, 1991; Northlands Associates Ltd., 1989). This appears to be due to the storage capacity of the constructed drainage and the increased absorption created by the drained peat. Although the rate and timing of drainage from the harvesting area will be slightly modified during construction and operation, the potential adverse effect of the project on the drainage pattern was assessed as minor. No specific mitigation measures are proposed. Follow-up proposed includes monitoring of discharge flow rates from the harvest area in accordance with licence terms and conditions. The residual effect of changes to the surface water regime was determined to be not significant (Table 14).

Suspended sediment levels in the surrounding wetlands, ponds and creek may become elevated during spring snowmelt and major precipitation events due to increased exposed peat area associated with harvesting. As discussed in section 4.1.6, baseline surface water samples collected from the waterbodies within the sub-area generally had low suspended solids concentrations (<10 mg/L). Drainage from the harvest site will not be discharged directly into a waterbody however as the outlet uses over-land flow with the existing drain terminating at an adjacent pear bog area. This will provide ample time for particulate matter in the water to be filtered by the bog area prior to flowing to a waterbody. The potential adverse environmental effects to surface water quality were determined to be minor. Proposed mitigation includes installing a gated culvert to block drainage from the harvest area if needed to manage suspended sediment. Proposed follow-up includes collecting surface water samples from the outlet monthly with analysis for suspended sediment levels, develop additional surface water sampling if required in consultation with Manitoba Conservation and Climate, cleaning of drainage ditches on a regular basis, periodically inspecting for evidence of erosion and adherence to licence terms and conditions. The residual effect of increase surface water runoff on suspended sediments was determined to be not significant (Table 14).

The surface water chemistry in the downstream receiving water may become altered during site construction and operation associated with the drainage management. As discussed in section 4.1.6, baseline surface

water samples collected from within the Evergreen 1 sub-area had acidic pH levels that were outside of the MWQSOG and CCME guidelines for the Protection of Freshwater Aquatic Life. Elevated concentrations of aluminum and iron in most surface water samples collected at the sub-area also exceeded MWQSOG and CCME guidelines, however these parameters are commonly naturally elevated in the environment (e.g. KGS Group, 2010a; KGS Group, 2010b). The proposed harvesting will discharge water overland and eventually into the Winnipeg River. The proposed development will alter the direction of some surface drainage, as well as the timing and rate of drainage, in particular during the initial drainage of the harvest area. The volume of water discharged during initial drainage of the 60 ha harvesting area is minimal in comparison to the drainage area within the watershed and the size of the receiving catchment. The potential adverse environmental effects to surface water quality were determined to be minor. Proposed mitigation includes using a gated culvert to control discharge from the harvest area if required. If the control of the discharge is not sufficient in maintaining the water chemistry, a limestone or carbonate lined drainage ditch can be installed to increase the pH of the draining bog water before being discharged to the environment. Proposed follow-up includes collecting monthly surface water samples from the outlet to carry out pH analysis. Any additional surface water sampling required will be developed in consultation with Manitoba Conservation and Climate. The residual effect of bog water runoff on surrounding water bodies was determined to be not significant (Table 14).

Surface water in the development area may become contaminated during construction and operation from accidental leaks, spills or releases of fuels or other hazardous substances. The baseline surface water sampling did not include contaminants such as hydrocarbons, however, it is assumed that they would not be present as the area is remote. The potential adverse effect of spills on surface water quality was assessed to be moderate. Proposed mitigation includes preventing leaks, spills and releases, providing secondary containment for fuel storage, requiring drip trays for equipment, providing spill clean-up equipment and materials, and preparing an emergency spill response plan (Sun Gro, 2017). Follow-up proposed involves periodic inspections for leaks, spills and releases, remediate and record any fuel spills and releases, periodic updates of the emergency response plan and adherence to license terms and conditions. The residual effects of accidental leaks, spills and releases on surface water quality were determined to be not significant (Table 14).

5.3.6 VEGETATION

The proposed harvesting activities will result in the loss and disturbance of terrestrial vegetation including tree, shrub, herbaceous and grass species. A total of 60 ha of land will be cleared for the peat development. MBCDC has no records of rare or endangered plant species within 2 km of the Evergreen 1 sub-area, however, five species of conservation concern were noted to be present within the general area (Section 4.1.7). None of these five species are listed under COSEWIC, SARA or ESEA. None of the 92 species identified during the vegetation surveys within the proposed harvest and donor areas are listed under COSEWIC, SARA or ESEA and none of the species identified by MBCDC as being within the general area were observed at the site. The potential adverse effect of the project on vegetation loss was assessed to be moderate. Proposed mitigation measures include minimizing loss and disturbance of vegetation, protecting vegetation along the perimeter of the cleared areas from blow-down, limiting construction activities to designated areas, utilizing timber removed from site, and re-vegetating disturbed or reclaimed areas during and after harvesting operations. Proposed follow-up includes periodic inspection for vegetation stress and mortality around the

cleared area and for the invasion of nuisance or weed species, and reporting annually on restoration activities implemented. The residual effects were determined to be not significant (Table 14).

Increases in fugitive dust will result in the local area during construction and operation of the project, as previously noted, which can settle on and stress vegetation in the local area. The potential adverse effects of dust on vegetation were assessed to be minor. However, the effects may be mitigated by controlling dust and stopping operational activities during high wind events. Proposed follow-up involves periodic inspection of the local area for accumulated dust. The residual effects of dust on vegetation were determined to be not significant (Table 14).

Peat harvesting and restoration activities pose a risk of starting a peat fire. Sources of fire include spontaneous combustion, lightning strikes, equipment and accidents. Sparks or dust accumulation on hot surfaces of the engine and exhaust are common causes of fire from equipment. Fire is a concern in the harvest area as well as the local and regional areas. Uncontrolled fires can result in substantial loss of peat resources to Sun Gro, forest cover and wildlife habitat, property damage and the loss of life. Potential adverse effects from a peat fire were assessed to be major. Mitigation measures proposed to address potential fires include implementation of an emergency response plan (Sun Gro, 2018b). Sun Gro has a First Responder Committee with employees from the different levels of operations. Committee objectives are to detect, prevent and make recommendations to company representatives and employees. This committee works in collaboration with provincial and municipal regulations, codes and guidelines to provide fire suppression equipment on-site, prepare, exercise and implement an emergency response plan that includes fire and explosion prevention, notification and response. The committee will notify Manitoba Conservation and Climate immediately if a fire or explosion occurs. Every piece of mobile equipment will be equipped with one 10 lb ABC fire extinguisher. Rake, conditioner, profiler and vacuum harvesters will also be equipped with one 12 L galvanized steel bucket with a 3 m rope. A mobile suction water pump with sufficient discharge hose to cover a 60 ha peat harvesting area will be installed. In areas without a natural water source, a filled water tank wagon will be on site. Other on-site equipment will also include fire blankets and water backpacks. Proposed follow-up includes regular inspections, including routine examination of fire suppression equipment, and periodic testing and evaluation of the emergency response plan, as well as, checking all firefighting equipment twice a month by the First Responder Committee. During extreme dry weather conditions this check will be performed twice a week. Preventative measures will include regular employee education and training in the use of this equipment. The residual effects of the project on the risk of fire were determined to be not significant (Table 14).

5.3.7 MAMMALS/HABITAT

Site preparation will result in loss and disturbance of mammal habitat. The total area to be cleared is approximately 60 ha. This area accounts for approximately 1.3% of the project study areas and 0.2% of the regional study area, in which there is abundant habitat, as this is a relatively undeveloped region. As previously noted, the MBCDC has no record of species of conservation concern within the project study area, and no mammal species listed under COSEWIC, SARA or ESEA were observed within the study area during baseline investigations. The potential adverse effects of clearing on habitat loss were assessed to be minor. Proposed mitigation measures include minimizing loss and disturbance of vegetation, limiting construction activities to designated areas, limit operation activities to areas disturbed during construction and re-

vegetating disturbed or reclaimed areas after harvesting is complete. Proposed follow-up involves periodic inspection during construction and operation, maintenance of re-vegetated areas, and ensuring adherence to environmental guidelines and protocols. The residual effects of mammal habitat loss and disturbance were determined to be not significant (Table 14).

Construction activities and equipment use during operation may have adverse effects on terrestrial mammals. Some of the mammals may adapt, whereas most will avoid the area and use the abundant surrounding habitat. As discussed above, no protected species have been documented within the regional study area, and none were observed at the sub-area. Therefore the potential adverse effects were assessed to be minor. Proposed mitigation measures include minimizing the area of disturbance by limiting construction activities to designated areas, limit operation activities to areas disturbed during construction, maintaining habitat around the sub-area and implementing the PRP to restore wildlife habitat. Follow-up proposed includes maintenance of re-vegetated areas and ensuring adherence to licence terms and conditions. The residual effects were determined to be not significant (Table 14).

Vehicle traffic associated with site preparation and operation activities, in particular transporting peat, may result in increased vehicle – wildlife interactions and associated wildlife mortalities, vehicle damage, and human injury or death. No local data are available on wildlife mortalities, vehicle damage or human injury/deaths. The potential adverse environmental effect of peat harvesting operations on vehicle – wildlife interactions was assessed to be minor. Mitigation measures proposed to address the effects on wildlife-vehicle interactions include operating transport trucks during daylight hours, providing wildlife awareness information to drivers and adhering to posted speed limits. Proposed follow-up includes maintaining records of vehicle-wildlife interactions. The residual effect was determined to be not significant (Table 14).

Domestic waste materials at the bog facility may attract problem or nuisance wildlife to the development area. Problem or nuisance wildlife may include black bear, porcupine, skunk, rodents or raccoons. No garbage facilities will be installed at the Evergreen 1 sub-area and any garbage generated will be removed from site daily for off-site disposal. The potential environmental effect was assessed to be minor. Mitigation measures proposed include regular disposal of waste at existing waste facilities and use of animal deterrents such as noise-makers, reflectors and scents if required. Proposed follow-up includes maintaining records of problem or nuisance wildlife and adhering to licence terms and conditions. The residual effect of problem or nuisance wildlife associated with the peat mining operation was determined to be not significant (Table 14).

5.3.8 BIRDS/HABITAT

Site preparation will result in loss and disturbance of migratory bird habitat and potentially waterfowl habitat during site preparation. In addition to the tree clearing being a direct impact on bird habitat, disturbance through noise in proximity to the proposed harvest sites may adversely impact waterfowl habitat. As discussed in Section 4.1.9, one rare bird species was documented within the sub-area; the rusty blackbird (S4B; listed by COSEWIC and SARA as “Special Concern”) who’s breeding habitat includes forest wetlands, such as slow-moving streams, peat bogs, sedge meadows, marshes, swamps, beaver ponds and pasture edges. The 100 m vegetation buffer zones to be established around waterbodies will preserve habitat near waterbodies and will reduce direct impacts from construction and operation activities. This is the habitat most likely to be used by the rusty blackbird. Additionally, MBCDC noted recordings of two species of conservation concern in the area: eastern wood-pewee and eastern whip-poor-will. Preferred breeding

habitat for these species does not appear to be present within the sub-area which consists primarily of black spruce bogs, as their preference includes forest clearings, and mixed and deciduous forests. The potential adverse environmental effects of habitat loss were generally assessed to be minor. Proposed mitigation measures include minimizing loss and disturbance of vegetation, completing tree clearing in the winter in accordance with the *Migratory Birds Convention Act* (specifically outside of critical nesting and rearing periods of April 14 to August 28), limiting construction activities to designated areas, limit operation activities to areas disturbed during construction, maintain 100 m buffer zone around lakes and sub-area boundaries, and re-vegetating disturbed or reclaimed areas after harvesting is complete. Proposed follow-up involves periodic inspection during construction and operation, maintenance of buffer zones and re-vegetated areas, and ensuring adherence to environmental guidelines and protocols. The residual effects of bird habitat loss and disturbance were determined to be not significant (Table 14).

Noise and vibrations associated with the use of heavy equipment during construction and operation of the proposed harvesting area may result in the disturbance of migratory and other birds and waterfowl during nesting and rearing periods. Spring and early summer are the most critical times for most of these bird species. The clearing will be conducted during the winter outside of these critical times. Therefore the potential adverse effects of peat harvesting on birds were assessed to be minor. Proposed mitigation measures include locating peat harvesting components away from any identified critical migratory bird habitat and scheduling construction activities outside of critical nesting and rearing periods, and maintaining buffer zones around waterbodies and sub-area boundaries. Proposed follow-up consists of adherence to licence terms and conditions. The residual effects on bird nesting and rearing were determined to be not significant (Table 14).

5.3.9 AQUATIC BIOTA/HABITAT

Construction and operation of the proposed project may have adverse effects on aquatic biota and habitat in the development area. As noted in section 4.1.10, the two unnamed lakes within the sub-area provide fish habitat and the presence of forage fish species such as central mudminnow, brook stickleback; and northern redbelly dace was confirmed. Pearl dace were also encountered in the existing drainage ditch east of the sub-area. It is possible that other small bodied species that are tolerant of stagnant, low oxygen concentration conditions typical of peat/bog lakes may also occur in the lakes. However, none of the fish species observed during site investigations are rare or have provincial or federal protection. It is not known whether large-bodied fish occur in the lakes. There does not appear to be any connectivity between on-site lakes and other waterbodies. No development will occur within 100 m of the lakes within the sub- area therefore, the concerns are primarily associated with the drainage from the development area.

Drainage and harvesting activities during operation of the project could result in increased sediment loads to adjacent waterbodies. Elevated levels of suspended sediment can reduce water quality, which may interfere with fish spawning, navigation and the ability to locate food and escape predators. Settling suspended particles can potentially smother and kill fish eggs or larvae. The drainage plan for the Evergreen 1 sub-area does not discharge any water to either of the lakes within the sub-area or any other natural waterbody. A control culvert with a sliding gate will be installed at the outlet which can stop the flow of water leaving the site, if required, during a major precipitation event which exceeds the design flow criteria. Closing the culvert gate allows for the settlement of suspended peat particles. Water leaving the outlet ditch will flow into the

existing Evergreen 2 and 3 outlet ditch and continue downstream where it will be discharge overland (i.e. not into a waterbody). The potential adverse effects of sediments on aquatic biota and habitat were assessed to be minor. Mitigation measures include maintaining the 100 m buffer zones around the lakes and the installation of the gated culvert. Follow-up measures included periodically inspecting the outlet ditch for debris, cleaning of drainage ditches and monitoring water discharge on a monthly basis as previously detailed in Section 5.3.5. The residual effects were assessed to be not significant (Table 14).

Installation of a culvert required to discharge on-site water to the existing drainage ditch may have potential adverse effects on aquatic biota and habitat within the existing drainage ditch. The potential adverse effects were determined to be minor. Proposed mitigation includes following the Manitoba Stream Crossing Guidelines for the protection of Fish and Fish Habitat and following best management practices (regarding timing window, sediment/erosion control, revegetation of disturbed soils). No follow-up activities are proposed. The residual effect of disturbance to aquatic biota and habitat was determined to be not significant (Table 14).

5.3.10 AMPHIBIANS AND REPTILES

Peat harvest area construction and operation activities, in particular site drainage and equipment and vehicle use may have adverse effects on amphibians and reptiles and their habitat in the harvest area. A request to the MBCDC did not identify any documentations of amphibian or reptile species of conservation concern within 2 km of the project site, however MBCDC did note that the northern redbelly snake and snake hibernaculum(s) have been recorded in the general area. During the 2020 field survey none of the amphibians and reptiles identified on site were provincially rare. However, the northern leopard frog was observed on site and it is listed under COSEWIC and SARA as a species of Special Concern. As discussed in Section 4.1.11, this species remains widespread but is of Special Concern as it has experienced a considerable reduction of range and loss of populations in the past. The northern leopard frog uses a variety of wetland habitats to meet its overwintering and breeding needs therefore the species is adversely affected by habitat fragmentation and conversion, including wetland drainage. While the proposed development will alter the existing bog area; the unnamed lakes within the sub-area will have a buffer of 100 m. This buffer will provide a substantial area of habitat with emergent vegetation along the shorelines which should mitigate potential effects of the project on the northern leopard frog. The potential adverse effects were assessed to be minor. Proposed mitigation includes minimizing the area of disturbance by limiting construction activities to designated areas, limit operation activities to areas disturbed during construction and minimizing loss and disturbance of vegetation around ponds by retaining a 100 m buffer zone. No follow-up activities are proposed. The residual effects of the project on amphibians and reptiles were determined to be not significant (Table 14).

5.4 Socioeconomic Effects Assessment

5.4.1 ECONOMIC CONDITIONS

The economy in the regional area surrounding the proposed development is dependent on agriculture, hydroelectric generation, mining, forestry and tourism. The peat harvesting industry currently also has a positive impact in the development area, employing residents from the surrounding communities, supporting

local businesses, contracting local companies for service works (e.g. trucking, sewage and waste disposal) and supporting the local economy through payment of property taxes. The proposed project will support the continued employment of six existing Sun Gro employees from the surrounding area. As the Evergreen 2 and 3 harvest areas have two to three years of harvestable peat remaining, new areas to harvest are needed to maintain the current production. Therefore, the potential effect to the regional economy was determined to be positive. As such no mitigation or follow-up activities are proposed (Table 14).

5.4.2 BUSINESS OPPORTUNITIES

Additional business opportunities will be created for local contractors associated with the contract for harvesting merchantable timber, constructing the access road with culvert installation, transporting harvested peat, disposal of sewage and domestic wastes as well eventual site restoration. The potential effects were determined to be positive. As such no mitigation or follow-up measures have been proposed (Table 14).

5.4.3 TRAFFIC

Truck traffic along the access road will increase dust however all highways traveled by peat haul trucks are paved. Peat haul trucks may further degrade the road requiring more frequent road maintenance and has the potential to increase the number of vehicle accidents and vehicle-wildlife interactions. There may be a small and temporary increase in traffic during construction due to site preparation activities. During operation there may be a short term increase in traffic once harvesting begins at Evergreen 1, during the time when harvesting is still occurring at Evergreen 2 and 3. However, once harvesting ceases at Evergreen 2 and 3 in an estimated two to three years, there may be an overall reduction in peat haul trucks as all the peat harvest within the Evergreen cluster of bogs will be from Evergreen 1 which has a smaller overall harvest area than Evergreen 2 and 3. Transport trucks will deliver the peat from the harvest area to the processing and packaging facility near Elma by travelling east on PTH 44 to PTH 11, then south on PTH 11. When the full 60 ha area in Evergreen 1 is being harvested, approximately 301 truckloads would be required annually, which is equivalent to approximately 10 trucks/week or 1.43 trucks/day based on the proposed 7 days/week operation schedule from April to October. The potential adverse effects associated with the traffic were assessed to be moderate. Proposed mitigation measures include dust control on the access road by using an approved suppressant such as water, reducing the number of vehicles during high wind events, directing all traffic associated with the development to drive according to road conditions and adhere to the posted speed limits, operating transport trucks during daylight hours and providing wildlife awareness information to drivers. Follow-up measures proposed include recording the number of vehicles associated with the peat harvesting operation and any public complaints and vehicle accidents. Further action will be considered as warranted. The residual effect was determined to be not significant (Table 14).

5.4.4 NOISE AND VIBRATION

Construction and operation activities including the use of heavy equipment and transport trucks will result in increased noise and vibration levels in the local area. Transport trucks will also result in noise and vibration on the highways. There is a buffer zone of forest between the proposed harvest area and the sub-area boundary. Additionally the Evergreen 1 sub-area is in a remote area with no nearby neighbours. However, the transport trucks will overlap in time and space with local people traveling on the same highway and

therefore the potential adverse effects were assessed to be minor. Proposed mitigation includes muffling vehicles and equipment, limiting unnecessary long-term idling and requiring a high standard of maintenance for heavy equipment. Proposed follow-up involves monitoring and periodically tracking noise levels and public complaints. The residual effects of noise and vibration during construction and operating were determined to be not significant (Table 14).

5.4.5 HUMAN HEALTH

Due to the relatively sparse population density within the vicinity of the Evergreen 1 sub-area, there are very few people that would be affected by the operational activities. Regardless, the increased noise, vibrations and dust generated from the traffic transporting peat may affect the public attitude toward the project and may adversely affect their wellbeing. Additionally, with the traffic there is risk of vehicle collisions that could adversely affect the public and workers health. The potential adverse effects on human health and general public attitude/wellbeing were assessed to be moderate. Proposed mitigation measures include applying dust control such as water, reducing the number of vehicles traveling during high wind events, driving according to road conditions, adhering to the posted speed limits and operating transport trucks during daylight hours. Proposed follow-up involves monitoring dust and tracking any public complaints. Further action will be considered as warranted. The residual effect on human health was determined to be not significant (Table 14).

Air quality may potentially be affected by volatile organic carbons (VOCs) and carbon monoxide (CO), propane gas, and dust. As there are no indoor spaces (e.g. site trailer, maintenance garage) planned for the Evergreen 1 sub-area or within the existing Evergreen 2 and 3 staging area, indoor air quality is not a concern. VOCs and CO may be a concern when in close proximity to operating machinery. The potential adverse effects of air quality on human health were determined to be minor. Mitigation measures proposed include ensuring a high standard of equipment maintenance. Follow-up includes regular maintenance of equipment. The residual effect was determined to be not significant (Table 14).

Construction and operation of the proposed peat development may have adverse effects on public and worker safety. Due to the remote location and limited access to the project site, security measures will be limited. A signs indicating ‘No Trespassing’ and locked gates are already installed on the main access road to the existing Evergreen 2 and 3 sub-area. The gates will remain locked at night and during inactivity at the site. As well, the main ditches surrounding the harvesting areas will limit access to trespassers. Due to the inaccessibility of the site to the public the potential adverse effects on public safety are negligible, whereas the effects on worker safety were assessed as minor. Proposed mitigation to reduce worker safety includes compliance with Manitoba Workplace Safety and Health regulations, development and enforcement of standard operation procedure guidelines, provision of training to employees and ensuring all visitors to the site have reported in and are accompanied by an employee. Follow-up proposed includes recording the occurrence of workplace accidents/incidents and updating employee training and safety guidelines as required. The residual effect was determined to be not significant (Table 14).

5.4.6 AESTHETIC VALUES

The proposed peat harvesting operation is located in a relatively remote location with very few local residents and is unlikely to be seen by regional visitors. Additionally, the Evergreen 1 sub-area is only

accessible via the existing access road to Evergreen sub-areas 2 and 3, which is gated. Therefore any potential effects of the project on aesthetics are primarily associated with transportation of peat. The truck traffic on the existing access road will contribute to covering vegetation in a layer of dust between rain events. The potential adverse effects of the project on aesthetic values were assessed to be minor. Proposed mitigation measures include utilizing dust control methods and covering loads during transport to and from the site. While not visible to the public re-vegetation of the harvest area in accordance with the PRP (Vertex, 2018) will return the aesthetics in the area to a natural environment after peat harvesting. Proposed follow-up includes observing dust levels and debris and recording public complaints. The residual effect of decreased aesthetics was determined to be not significant (Table 14).

5.4.7 ABORIGINAL AND TREATY RIGHTS

The proposed peat harvest area is located within crown land and therefore can be used for hunting, trapping, and other traditional harvesting practices as part of Aboriginal and Treaty rights. As such, development of the project may reduce access to lands that could be used to enact Aboriginal and Treaty rights. No First Nation communities are located within the regional study area, however several communities are situated within 100 km of the site (see Section 4.2.2). These communities may have interest in the Evergreen 1 bog area and possible traditional land use in the area based on their proximity. The site is not located within any identified First Nation Community Interest Zones, with the nearest Community Interest Zone being that of Brokenhead Ojibway Nation situated approximately 3 km west of the site. The Evergreen 1 sub-area is located within the Recognized Metis Harvesting Area. The current or historic use of the Evergreen 1 sub-area for Aboriginal and Treaty rights is not known. As part of the public and Indigenous engagement program, Sun Gro reached out to communities in the area to examine if the proposed harvest area is used for Aboriginal and Treaty rights (see Section 3.0). At the time of submission of this EAP, no specific information related to resource use in the area was available. The Evergreen 1 sub-area is in a relatively remote location and access to the site is limited, with the best access being the gated access road from PTH 44 through the Evergreen 2 and 3 harvest areas. Additionally, the Evergreen 1 sub-area does not contain unique habitat as peat bogs are regionally abundant and the area to be cleared (60 ha) is relatively small in comparison to the surrounding Agassiz Provincial Forest (79,500 ha). With the exception of initial site preparation which occurs in the winter, peat harvesting activities at the sub-area will generally be limited to the summer, therefore not overlapping with hunting and trapping activities in the late fall to spring period. The potential adverse effects of the project on Aboriginal and Treaty rights was assessed to be minor. Proposed mitigation measures include minimizing the area cleared, restoring the harvest area to pre-harvest conditions (peat-accumulating bog) once harvesting is complete, and maintaining buffer zones around lakes and the sub-area boundaries. Additional mitigation measures will be considered if warranted, and based on ongoing communication with First Nation and Metis groups that may use the area for Aboriginal and Treaty rights. Follow-up measures include ensuring adherence to license terms and conditions. The residual effect of decreased access to lands for Aboriginal and Treaty rights practices was determined to be not significant (Table 14).

Construction and operation of the proposed project may have adverse effects on resources harvested as part of Aboriginal and Treaty rights, such as vegetation, mammals and birds. As previously described, the harvest area is very small relative to the surrounding Agassiz Provincial Forest, and the harvest area is not unique in the area as peat bogs are regionally abundant. Additionally, no protected species were identified as part of the baseline biological surveys at the site. The potential adverse effects of the project on vegetation,

mammals and birds and their habitat was assessed to be minor to moderate (Sections 5.3.6, 5.3.7, 5.3.8). Therefore, the potential adverse effects of the project on resources harvested as part of Aboriginal and Treaty rights was assessed to be minor. Mitigation measures include those identified to protect vegetation, mammals, and birds (Sections 5.3.6, 5.3.7, 5.3.8) such as minimizing the loss and disturbance of vegetation, protecting vegetation along the perimeter of the cleared areas from blow-down, limiting construction activities to designated areas, maintaining habitat around the sub-area, maintaining 100 m buffer zone around lakes and sub-area boundaries, and re-vegetating disturbed or reclaimed areas during and after operation. Additionally, Sun Gro will maintain ongoing communications with First Nation and Metis groups with respect to use of the area for Aboriginal and Treaty rights. Proposed follow-up includes those identified to protect vegetation, mammals, and birds (Section 5.3). The residual effect of impacts to Aboriginal and Treaty rights was determined to be minor (Table 14).

5.4.8 RECREATION/TOURISM

The traffic associated with peat hauling on the highways and the generation of dust have the potential to affect tourism and recreational vehicle use in the area. However, as previously described the increase in traffic will be minimal and for a short period. As such, the potential adverse effects of the peat harvesting operation on recreational areas were assessed to be negligible. Proposed mitigation measures are those previously outlined for controlling dust and driving safely which include applying dust control such as water, covering loads during transport to and from the site, reducing the number of vehicles traveling during high wind events, driving according to road conditions, adhering to the posted speed limits and operating transport trucks during daylight hours. Proposed follow-up includes tracking public complaints. The residual effect was determined to be not significant (Table 14).

5.4.9 AREAS OF INTEREST

The proposed project is situated in a region rich in natural resources with current land use in the regional study area consisting of natural resource harvesting including forestry, agriculture, and hunting. As such, the proposed project to harvest natural resources is commensurate with the current land use in the regional area. With the measures proposed to mitigate the environmental effects of the project, the effect on land use will be negligible. The proposed project is also located near various areas of interest such as the Agassiz Provincial Forest, the Brokenhead Ojibway Nation Community Interest Zone, and several Areas of Special Interest (see Sections 4.2.6, 4.2.7). The proposed harvesting areas will be occupying land that may be used for hunting and trapping, which would make them no longer accessible for this purpose during the summer, although the surrounding land would still be accessible. The potential adverse environmental effect of the project on these areas of interest was assessed as minor. Proposed mitigation measures include limiting construction activities to designated areas, protecting adjacent trees from blow-down and re-using timber from clearing. Follow-up measures include periodically tracking the site during construction for signs of potential disturbances and ensuring construction crews adhere to designated areas. Residual environmental effects of the proposed development site on land use and areas of interest were evaluated to be not significant (Table 14).

5.4.10 HERITAGE RESOURCES

The Historic Resources Branch of Manitoba Culture, Heritage and Tourism has indicated that there are no known heritage sites within the sub-area and there is a low potential to impact significant resources and therefore has no concerns with the project (Appendix E). In the event that heritage resources are encountered, construction will cease and the Historic Resources Branch will be notified immediately. If this occurs, construction would only resume as directed by the Historic Resources Branch. Therefore, the potential for adverse environmental effects of the project on cultural resources is unlikely and assessed as not significant.

5.5 Effects of Accidents and Malfunctions

5.5.1 FIRES AND EXPLOSIONS

Fires and explosions may result from spontaneous combustion, lightning strikes, equipment malfunctions, improper handling and storage of hazardous materials, as well as various construction and operation activities. Diesel fuel and small quantities of gasoline may be stored, transported and dispensed as part of peat harvesting. Small quantities of hazardous materials and potentially flammable materials will be stored on-site. Fires and explosions can cause serious harm to staff, construction workers, contractors, the public and the environment. Project delays and increased costs to Sun Gro are possible. Potential adverse environmental effects of fires and explosions were assessed to be major. Proposed mitigation includes complying with applicable provincial and municipal legislation, codes and guidelines, maintaining the First Responder Committee, providing and testing fire suppression equipment on-site, preparing, exercising and implementing an emergency response plan that includes fire and explosion prevention (Sun Gro, 2018b), notification and response, regular employee training on use of equipment and notifying the Manitoba Conservation and Climate immediately if a fire or explosion occurs. Follow-up proposed includes adhering to licence terms and conditions, regular inspections, routine examination of fire suppression equipment, and periodic testing and evaluation of the emergency response plan. The residual effect of fires and explosions was determined to be not significant.

5.5.2 TRANSPORTATION ACCIDENTS

Heavy equipment, specialty equipment, large trucks and support vehicles are used during peat harvesting activities. Construction equipment and some materials will be brought onto the project site during construction. Once the peat harvesting development is operational, large trucks will haul peat to the processing plant. There is a risk of accidents involving trucks and other vehicles accessing the peat harvest site operated by Sun Gro staff, the public and others. Accidents may also occur while transporting other materials onto the project site. The potential adverse effects of ground transportation accidents were assessed to be major. Mitigation proposed includes safe transportation routes, speed restrictions and signage, compliance with applicable provincial and municipal legislation, an emergency spill response plan that includes transportation accident prevention and response, and notification of Manitoba Conservation and Climate immediately if an accident occurs. Proposed follow-up includes adhering to licence terms and conditions, periodic testing and evaluation of the emergency response plan, ensuring that dangerous goods carriers are licensed and inspecting all shipments for compliance with regulatory requirements. The residual effect of ground transportation accidents on the environment was determined to be not significant.

5.5.3 LEAKS AND SPILLS OF FUEL AND HAZARDOUS MATERIALS

Fuels and other hazardous substances may be released during site preparation and operation. Common hazardous substances include fuels (diesel, gasoline and propane), waste oils and lubricants as well as chemicals and solvents. Releases of hazardous substances may impair air quality, cause soil, surface water and groundwater contamination, and affect worker and public health depending on the type of product as well as the nature, size and location of the spill. Remediation of soil and groundwater contamination would be costly for Sun Gro and could result in project and operational delays. The potential adverse effects were assessed to be moderate. Proposed mitigation includes preventing spills, releases and accidents, ensuring compliance with applicable provincial legislation, guidelines, codes and best practices, using licensed contractors, preparing an emergency response plan that includes hazardous substance release prevention, ensuring appropriate storage, notification and response, and notifying Manitoba Conservation and Climate immediately if a release occurs. Follow-up measures include remediation of any spills, adhering to licence terms and conditions, periodic testing and evaluation of the emergency response plan, inspecting hazardous substance storage for compliance with regulatory requirements, and maintaining waste manifests and tipping receipts. The residual effect of hazardous substances releases was determined to be not significant.

5.6 Effects of the Environment on the Project

5.6.1 CLIMATE

The cold continental climate of southern Manitoba produces very harsh environmental conditions for buildings, infrastructure and facilities. The Pinawa weather station, located approximately 20 km east of the project site, is the closest active weather station. The mean annual air temperature at the weather station is 2.8°C and the daily mean temperature ranges between 19.3°C in July and –16.6°C in January (Environment Canada, 2020). The lowest temperature ever recorded was -7.8°C in February 1966 whereas the highest was 37.5°C in June 1995 (Environment Canada, 2020). Any equipment or infrastructure on-site must be designed to withstand extreme low and high temperatures, damaging winds, significant precipitation events and hail, and even tornadoes. No buildings are planned as part of the development of the Evergreen 1 sub-area.

High wind velocities can cause increased dust and blow loose peat materials off the property. Mitigation measures include limiting stockpiled material during high wind events, orienting peat stockpiles in the prevailing wind direction to minimize the area exposed, observing wind directions before unloading and loading of peat, ensuring peat stockpiles has a crusted layer on top, using a tree or brush buffer to act as a windbreak, modifying and equipping peat harvesters to reduce peat dust emissions, covering peat transport trucks with tarps to eliminate dust emissions during transport, instructing employees in proper harvesting equipment operation to reduce dust emissions and suspending operations during high wind events. The residual effect of wind on the project was determined to be not significant.

Heavy rains or abrupt snowmelt can potentially flood the peatland area, cause soil erosion and create unsafe working conditions, slippery surfaces, and reduced visibility. The resulting high volumes of surface water runoff can erode off-site drainage channels and wash out roads and culverts. Proposed mitigation includes designing adequate drainage channels, installing a gated culvert to control drainage, providing additional on-site pumping capacity, suspending work during high precipitation events and including flooding in the

emergency response plan. The residual effect of precipitation on the project was determined to be not significant.

Manitoba is in a low seismic hazard area in Canada. Further consideration of the effects of an earthquake on the project is not warranted in this environmental assessment.

5.6.2 FLOODING

The proposed peat harvesting development site is not normally subjected to significant overland flooding during spring runoff, or following significant precipitation events. The site is typically wet in low lying locations, but peat contains a large capacity for absorption. Once on- site drainage has been constructed, all surface water within the site will drain north-east toward a large bog complex and eventually to the Winnipeg River. Temporary flooding may occur from extreme precipitation events if on-site drainage becomes overwhelmed. Mitigation measures are the same as those proposed to deal with heavy rains as noted in Section 5.6.1. The residual effect of flooding on the proposed project was determined to be not significant.

5.6.3 WILDFIRE

Wildfire is common in the Lake of the Woods ecoregion. Operation and construction of the proposed project can potentially be interrupted in the event of a forest fire burning near the site. Forest fires risk the safety and health of workers and may damage equipment. Potential effects of wildfire on the construction and operation of the project were assessed to be minor. Proposed mitigation measures include providing fire suppression equipment at construction areas and within buildings during operation and implementing an emergency response plan that includes fire prevention, notification and response. Follow-up includes periodic testing of fire suppression equipment during construction and operation, periodic assessment of wildfire risk during construction and operation and periodically updating the emergency response plan. The residual effect of wildfires on the operation and construction of the project was determined to be not significant.

6.0 MITIGATIVE SUMMARY

Mitigation measures is defined under the *Impact Assessment Act* as measures to eliminate, reduce, control or offset the adverse effects of a project or designated project, and includes restitution for any damage caused by those effects through replacement, restoration, compensation or any other means. Mitigation measures for the proposed peat harvesting development are identified in Sections 5.3 and 5.4 and are summarized in Table 15. The nature of the mitigation measures, whether they are design, proposed, regulatory or management is shown in the table and described in the following sections.

6.1 Design Mitigation

Design mitigation includes measures that are either already included in the design of the proposed development or are to be addressed as a result of this environmental assessment. The design of the proposed development incorporates components, systems, controls and features that will mitigate potential adverse environmental effects typically associated with peat harvesting operations. Design mitigation for the proposed project are summarized in Table 15. Responsibility for implementing design mitigation rests with the proponent and their contractors.

6.2 Proposed Mitigation

Proposed mitigation includes measures that are identified in the environmental assessment report to address potential adverse environmental effects. These mitigation measures, while not required by legislation, serve to eliminate, reduce and control potential adverse environmental effects and render them not significant. These measures are summarized in Table 15. For the most part, the measures are operational in nature and require incorporation into specifications for construction and standard operational procedures.

6.3 Regulatory Requirements

The proposed peatland development is subject to various federal and provincial environmental legislations. Regulatory requirements serve to mitigate adverse environmental effects, which may have potentially significant environmental and human health consequences. Environmental legislation applicable to this development includes the following:

Manitoba

- *The Peatland Stewardship Act*
- *The Environment Act*
    - Peat Smoke Control Regulation
    - Litter Regulation
    - Waste Disposal Grounds Regulation
- *The Dangerous Goods Handling and Transportation Act*
    - Environmental Accident Reporting Regulations
    - Storage and Handling of Petroleum Products and Allied Products Regulation

  - Generator Registration and Carrier Licensing Regulation
  - Manifest Regulation
- *The Public Health Act*
  - Atmospheric Pollution Regulation
  - Protection of Water Sources Regulation
- *The Ozone Depleting Substances Act and Regulations*
- *The Forest Act*
  - Forest Use and Management Regulations
- *The Workplace Safety and Health Act* and Regulations
- *The Contaminated Sites Remediation Act*
- *The Climate and Green Plan Act*
- *The Endangered Species and Ecosystems Act*
- *The Highway Traffic Act* and Regulations
- *The Water Protection Act*

Canada

- *Impact Assessment Act*
- *Canadian Environmental Protection Act* and Regulations
- *Fisheries Act*
- *Species at Risk Act*
- *Migratory Birds Convention Act*

Regulatory mitigation applies to site preparation activities, harvesting operations, transport and storage of hazardous substances, reporting of spills and accidental releases, reporting as a licence condition, worker and public safety, etc. Table 15 includes mitigation measures that are regulatory in nature.

Guidelines followed in the preparation of an EAP for peat harvesting developments include the following:

- Manitoba Environment Act Proposal Report Guidelines
- Manitoba Water Quality Standards, Objectives, and Guidelines
- Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, Summary of Guidelines for Fresh Water Aquatic Life

6.4 Management Practices

Good environmental management practices can further protect the environment and human health and safety from potentially adverse effects of peat harvest site preparation and operation activities. While many of the practices are not required by legislation, various policies, guidelines and procedures exist that provide direction in relation to environmental protection, environmental stewardship and sustainable development principles and guidelines. Examples of good management practices are summarized in Table 15.

Implementation of mitigation measures proposed by Sun Gro will be carried out through development of an Environmental Protection Plan that includes mitigation measures, follow-up requirements, licence and

permit terms and conditions, and other related requirements. The Environmental Protection Plan also provides for effective integration of environmental assessment results into operational procedures.

6.5 Contingency Planning

Sun Gro has prepared and implemented a contingency plan for the Evergreen peat harvest areas. The plan includes provisions for fires, explosions, accidents, malfunctions, spills, storms and floods. Sun Gro has formed a fully functional team at the site made up of employees from all levels of the operation. The team works closely with communities, local and provincial governments on regulations, codes and guidelines as well as to implement emergency response procedures as with their existing bog sites. These procedures will include training in emergency preparedness and evacuation plans for such emergencies as fire and explosion.

6.6 Recovery Plan

A PRP has been developed and submitted for Sun Gro's Peat Harvest Licence No. 3, in accordance with requirements of *The Peatlands Stewardship* Act of the Forestry and Peatlands Branch of Manitoba Conservation and Climate (Vertex, 2018). The recovery plan outlines the restoration process of harvest areas when harvesting is complete. As Sun Gro did not initially plan to harvest at the Evergreen 1 sub-area within the PHL license term, the PRP will be amended to include additional information regarding the restoration of Evergreen 1 sub-area.

7.0 FOLLOW-UP

Follow-up is defined under the *Impact Assessment Act* as a program to verify the accuracy of the impact assessment of a project and determining the effectiveness of any mitigation measures. Follow-up requirements identified for the proposed peat harvesting development in Sections 5.3 and 5.4 are summarized in Table 16. The primary nature of the follow-up, whether they are inspecting, monitoring, record keeping or reporting is shown in the table and described in the following sections.

7.1 Inspecting

Inspecting involves periodic or regular observations of the project and local area during site preparation, construction and operation activities to determine whether mitigation measures are implemented and if they are effective in eliminating, reducing or controlling adverse environmental effects. Inspecting includes surveillance to identify problems, issues and concerns, and environmental effects not predicted in the environmental assessment report. Inspections may involve the use of checklists and should be maintained at the project site. Inspection requirements for the proposed peatland development during site preparations and construction are summarized in Table 16. Sun Gro staff is typically responsible for the inspections during the site preparation and operation phases.

7.2 Monitoring

Monitoring includes periodic or regularly scheduled collection or sampling for environmental information in the development or project area. Monitoring may be required by the environmental assessment or it may become necessary as a result of inspections that are carried out after the assessment. Follow-up monitoring for the proposed development during site preparation includes surface water quality after spring thaw. Monitoring during site operation includes surface water quality at the discharge location monthly or as directed by Manitoba Conservation and Climate in the Environment Act Licence.

7.3 Record Keeping

Record keeping includes maintaining files and documentation related to mitigation measures and follow-up implemented as well as recording public complaints. Record keeping requirements for the proposed development include monitoring and tracking complaints from local residents, submission of Safety Data Sheets (SDSs) for all products used, number of vehicle-wildlife interactions, number of problem or nuisance wildlife situations, number of amphibians and reptiles observed on the site, fuel volumes delivered and used, maintaining peat transportation manifests, number of monitoring and testing samples collected and analytical data generated, details of incidents requiring implementation of the emergency response plan and updating the emergency response plan following testing.

7.4 Reporting

Reporting in the context of environmental assessment follow-up includes documentation and communication that mitigation measures and follow-up are implemented and whether or not they have been effective. Such reports are normally required by the Manitoba Conservation and Climate Environment Act Licence and are placed in the public registry for the project. Reporting is also required in the event of an accidental spill or release of hazardous substances. Reporting requirements for the proposed development will also likely include an annual compliance surface water quality report, summary of annual generation of peat and a detailed report following incidents that require implementation of the emergency response plan. Sun Gro will be responsible for submitting all required reports to Manitoba Conservation and Climate as specified in the Environment Act Licence.

8.0 CONCLUSIONS

KGS Group was retained by Sun Gro to prepare a Manitoba EAP to obtain the required major alteration to the existing Manitoba Environmental Act License 305R for the proposed expanded peat harvesting development. The proposed project consists of expanding the existing peat harvesting development at the Evergreen Bog to include an additional sub-area (Evergreen 1). An EAP is required for environmentally significant developments within the province of Manitoba, under *The Environment Act* (C.C.S.M. c. E125). The report followed the requirements of the environmental assessment and licensing process under *The Environment Act* (Manitoba). A peat harvesting operation such as the one proposed by Sun Gro is considered a mining development under the Classes of Development Regulation 164/88 and is therefore considered a Class 2 Development. The EAP was completed in accordance with the Manitoba *Environment Act Proposal Report Guidelines* (2018).

The environmental assessment of the proposed peat project was carried out based on project information provided by Sun Gro, information acquired from literature, internet searches, and publications by the Canadian peat industry and environmental organizations; contacts with federal and provincial government representatives; engagement with stakeholders; and site investigations by the project team. Potential environmental effects of the proposed peat harvesting project were identified using scoping methods, public comments, advice from specialists and professional judgment. Effects of the environment on the project were also determined. Mitigation measures were identified to eliminate, reduce and control environmental effects determined to be adverse. Follow-up monitoring was proposed to verify the accuracy of the assessment and determine the effectiveness of the mitigation measures. Significance of the residual environmental effects remaining after mitigation was then evaluated.

Based on the available information on the project and the environment, the assessment of environmental effects outlined in this assessment, and the application of proposed mitigation measures and the conduct of follow-up monitoring, the proposed project is not expected to result in any significant residual adverse environmental effects.

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TABLES

TABLE 1
ESTIMATED PEAT PRODUCTION SCHEDULE

Production Year	Active Harvesting	Total Volume (m^3) Harvested/Year	Truckloads/ Year
2021	60	51,000	301
2022	60	51,000	301
2023	60	51,000	301
2024	60	51,000	301
2025	60	51,000	301
2026	60	51,000	301
2027	60	51,000	301
2028	60	51,000	301
2029	60	51,000	301
2030	60	51,000	301
2031	60	51,000	301
2032	60	51,000	301
2033	60	51,000	301
2034	60	51,000	301
2035	60	51,000	301
2036	60	51,000	301
2037	60	51,000	301
2038	0	0	0
Total		867,000	5,117

TABLE 3
FIELD CHEMISTRY

Sample ID	Date	Time	Water Source	Parameter					
				Temperature (°C)	pH (pH units)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (%)	Turbidity (NTU)
EG-01	03-Jun-30	11:00	South Lake	23.5	5.76	74.1	2.96	48.7	1.44
EG-02	03-Jun-30	12:20	Peat	2.8	2.96	116.1	2.66	20.1	7.42
EG-03	03-Jun-30	13:45	North Lake	25.9	6.32	36.7	8.26	100.8	1.72
EG-04	03-Jun-30	15:00	Peat	3.2	4.61	65.7	3.02	23.5	1.66
EG-05	04-Jun-30	13:45	Creek/Low Area	22.4	6.36	172.4	5.08	59.0	1.33
EG-06	04-Jun-30	15:40	Drainage Ditch	17.9	7.58	637.0	10.16	107.3	13.41[6]
Manitoba Water Quality Standards, Objectives, and Guidelines [1]									
Freshwater Aquatic Life				-	6.5 - 9.0	-	[2]	-	-
CCME [3]									
Protection of Aquatic Life (Freshwater)				-	6.5 - 9.0	-	[4]	-	Narrative[5]

Notes:
NTU = Nephelometric Turbidity Units

1. Manitoba Water Quality Standards, Objectives, and Guidelines, Manitoba Water Stewardship, November 28, 2011.
2. MWQSOG lowest acceptible dissolved oxygen concentration (mg/L):

Ecosystem	Early Life Stages	Mature Life Stages
Cool Water (>5°C)	6.0	5.5
Cold Water (≤5°C)	9.5	6.5

3. CCME - Canadian Council of Ministers of the Environment. Canadian Environmental Quality Guidelines, 1999. Updated 2018 Canadian Water Quality Guidelines for the Protection of Aquatic Life
4. Warm water life criteria (applicable <5°C) is 6.0 mg/L for "early life stages" and 5.5 mg/L for "other life stages";
   Cold water life criteria (applicable for >5°C) is 9.5 mg/L for "early life stages" and 6.5 mg/L for "other life stages";
   If either of the "early life stages" or "other life stages" criteria were exceeded, the exceedence is highlighted in this table.
5. Turbidity - For clear waters: Maximum increase of 8 NTU from background for any short-term exposure (24-h period). Maximum average increase of 2 NTU from background levels for longer term exposures (greater than 24 h).
For high flow or turbid waters: Maximum increase of 8 NTU from background levels at any time when background levels are between 8 and 80 NTU. Should not increase more than 10% of background levels when background is >80 NTU.
6. Turbidity reading may be elevated due to ditch maintenance activities upstream of sample location.

Bold	- Exceedance of MSWQOG
	- Exceedance of CCME Criteria

TABLE 4
GENERAL WATER QUALITY

Sample ID	Date	Duplicate ID	Water Source	Parameter [1]																												
				pH (units)	E.C. (µS/cm)	Alkalinity as $CaCO_3$	Bicarbonate as HCO_3	Carbonate as CO_3	Hydroxide (OH)	Hardness as $CaCO_3$	Chloride (Cl) - Dissolved	Sulphate (SO_4) - Dissolved	Total Ammonia (N)	Nitrate & Nitrite (as N) - Dissolved	Nitrate (as NO_3) - Dissolved	Nitrate (as N) - Dissolved	Nitrite (NO_2) - Dissolved	Nitrite (as N) - Dissolved	Calcium (Ca) - Dissolved	Magnesium (Mg) - Dissolved	Potassium (K) - Dissolved	Sodium (Na) - Dissolved	Iron (Fe) - Dissolved	Manganese (Mn) - Dissolved	B.O.D.	Total Phosphorus	T.D.S.	T.S.S.	T.K.N.	Anion Sum (meq/L)	Cation Sum (meq/L)	Ionic Balance (%)
EG-1	3-Jun-20		South Lake	5.77	50	6.4	7.8	<1.0	<1.0	34	<1.0	<1.0	0.65	<0.071	<0.22	<0.050	<0.16	<0.050	9.3	2.5	<3.0	<5.0	0.64	0.23	2.9	<0.30	130	5.2	<5.0	0.13	0.76	NC
EG-2	3-Jun-20		Peat	3.53	110	<1.0	<1.0	<1.0	<1.0	8.1	<1.0	<1.0	0.18	<0.071	<0.22	<0.050	<0.16	<0.050	3.2	<2.0	<3.0	<5.0	0.82	<0.040	6.3	<0.30	170	7.5	<5.0	0.0000	0.50	NC
EG-3	3-Jun-20		North Lake	6.10	36	7.1	8.6	<1.0	<1.0	23	2.3	<1.0	0.058	<0.014	<0.044	<0.010	<0.033	<0.010	5.2	2.5	0.67	0.73	0.32	0.023	10	<0.30	56	8.8	<5.0	0.21	0.53	44
EG-4	3-Jun-20		Peat	4.31	36	<1.0	<1.0	<1.0	<1.0	14	2.7	<1.0	0.16	<0.014	<0.044	<0.010	<0.033	<0.010	3.0	1.6	0.78	0.58	0.25	0.019	3.3	<0.30	92	3.9	18	0.077	0.40	NC
EG-5	4-Jun-20		Creek/Low Area	6.67	160	90	110	<1.0	<1.0	100	25	<10.0	0.084	<0.014	<0.044	<0.010	<0.033	<0.010	28	8.4	1.4	1.6	<0.060	0.023	2.3	<0.030	180	<1.0	2.0	2.5	2.2	7.1
		SW-100		6.58	650	78	95	<1.0	<1.0	96	24	<10.0	0.066	<0.014	<0.044	<0.010	<0.033	<0.010	26	7.7	1.3	1.4	<0.060	0.0095	<2.0	<0.030	160	<1.0	1.7	2.3	2.0	5.7
EG-6	4-Jun-20		Drainage Ditch	8.15	150	340	420	<1.0	<1.0	400	1.7	14	0.045	0.11	0.51	0.11	<0.033	<0.010	120	24	1.7	2.7	0.58	0.045	2.3	<0.015	410	6.9	1.1	7.2	8.2	6.6
Field Blank	4-Jun-20			4.51	<2.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.015	<0.014	<0.044	<0.010	<0.033	<0.010	<0.30	<0.20	<0.30	<0.50	<0.060	<0.0040	<2.0	<0.030	<10	<1.0	<0.050	0.0000	0.031	NC
Laboratory Detection Limits				N/A	2.0	1.0	1.0	1.0	1.0	0.50	1.0/ 10.0	1.0/ 10.0	0.015/ 0.15	0.014/ 0.071	0.044/ 0.22	0.010/ 0.050	0.033/ 0.16	0.010/ 0.050	0.30/ 3.0	0.20/ 2.0	0.30/ 3.0	0.50/ 5.0	0.060/ 0.60	0.040	2.0	0.015/ 0.030/0.30	10/ 14	1.0/ 2.0	0.050/0.25/ 0.50/5.0	N/A	N/A	N/A
Manitoba Water Quality Standards, Objectives, and Guidelines [2]																																
Freshwater Aquatic Life				6.5 - 9.0	-	-	-	-	-	-	-	-	[3]	-	-	13	-	0.06	-	-	-	-	0.3	-	-	-	-	[4]	-	-	-	-
CCME[5]																																
Protection of Aquatic Life (Freshwater)				6.5 - 9.0	-	-	-	-	-	-	120[6a] 640[6b]	-	[7]	-	13[8a] 550[8b]	3[8a] 124[8b]	0.197	0.06	-	-	-	-	0.3	[9]	-	[10]	-	[11]	-	-	-	-

Notes:
E.C. = Electrical Conductivity
B.O.D. = Biochemical Oxygen Demand
T.D.S. = Total Dissolved Solids
T.S.S. = Total Suspended Solids
T.K.N. = Total Kjeldahl Nitrogen

1. All values are expressed in milligrams per litre (mg/L) unless otherwise specified.
2. Manitoba Water Quality Standards, Objectives, and Guidelines, Manitoba Water Stewardship, November 28 2011.
3. MWQSOG Surface Water Ammonia Guideline for Aquatic Life, Cool Water, All Periods (Eq. 3). Manitoba Water Stewardship, November 2011.
4. Total Suspended Sediment Guidelines:
   5 mg/L Induced Change over 30 days from background TSS <= 25 mg/L
   25 mg/L Induced Change over 1 day from background TSS <= 250 mg/L
   10% Induced Change over 1 day from background TSS > 250 mg/L
5. CCME - Canadian Council of Ministers of the Environment. Canadian Environmental Quality Guidelines, 1999. Updated 2018
   Canadian Water Quality Guidelines for the Protection of Aquatic Life
6. Chloride toxicity to freshwater organisms was evaluated using tests with both $CaCl_2$ and NaCl salts.
   a. Long term concentration - Derived with mostly no- and some low-effect data and are intended to protect against negative effects to aquatic ecosystem structure and function during indefinite exposures (e.g. abide by the guiding principle as per CCME 2007). Refer to Factsheet for more explanation.
   b. Short term concentration - Derived with severe-effects data (such as lethality) and are not intended to protect all components of aquatic ecosystem structure and function but rather to protect most species against lethality during severe but transient events (e.g. inappropriate application or disposal of the substance of concern).
7. Guideline for total ammonia is temperature and pH dependent. See table below and fact sheet for details.

Temp (°C)	pH							
	6.0	6.5	7.0	7.5	8.0	8.5	9.0	10
0	231	73.0	23.1	7.32	2.33	0.749	0.250	0.042
5	153	48.3	15.3	4.84	1.54	0.502	0.172	0.034
10	102	32.4	10.3	3.26	1.04	0.343	0.121	0.029
15	69.7	22.0	6.98	2.22	0.715	0.239	0.089	0.026
20	48.0	15.2	4.82	1.54	0.499	0.171	0.067	0.024
25	33.5	10.6	3.37	1.08	0.354	0.125	0.053	0.022
30	23.7	7.50	2.39	0.767	0.256	0.094	0.043	0.021

8. All nitrate concentrations presented here will be for the ion only (i.e. as mg NO_3-/L). Conversion factors for some of the commonly reported units in the literature are provided in the Factsheet.
   For protection from direct toxic effects; the guidelines do not consider indirect effects due to eutrophication.
   Freshwater: Derived from toxicity tests utilizing $NaNO_3$.
   a. Long term concentration - Derived with mostly no- and some low-effect data and are intended to protect against negative effects to aquatic ecosystem structure and function during indefinite exposures (e.g. abide by the guiding principle as per CCME 2007).
   b. Short term concentration - Derived with severe-effects data (such as lethality) and are not intended to protect all components of aquatic ecosystem structure and function but rather to protect most species against lethality during severe but transient events (e.g. inappropriate application or disposal of the substance of concern).
9. Guideline for manganese is dependant on hardness and pH and is based on an equation.
   a. Long term concentration - The CWQG for manganese (i.e. long-term guideline) is found using the CWQG calculator in Appendix B of the Scientific Criteria Document for the Development of the Canadian Water Quality Guidelines for the Protection of Aquatic Life: Manganese. Refer to Factsheet for more explanation.
   b. Short term concentration - The short-term benchmark is calculated using the benchmark calculator in Appendix B of the Scientific Criteria Document for the Development of the Canadian Water Quality Guidelines for the Protection of Aquatic Life: Manganese or the following equation:
   Benchmark = exp(0.878[ln(hardness)] + 4.76) where the benchmark is expressed in dissolved manganese concentration (µg/L), and hardness is measured as CaCO3 equivalents in mg/L.
10. If trigger ranges for total phosphorous are exceeded, the potential exists for an environmental impact. If trigger range is not exceeded, but TP is more than 50% above baseline values, the potential exists for an environmental impact.

Trigger ranges (mg/L):				
	ultra-oligotrophic	<0.004	meso-eutrophic	0.020-0.035
	oligotrophic	0.004-0.01(	eutrophic	0.035-0.10
	mesotrophic	0.010-0.02(	hyper-eutrophic	>0.10

11. Suspended Sediments Guideline (see Total Particulate Matter fact sheet for complete details):
   Clear Flow:
   Maximum increase of 25 mg/L from background levels for any short-term exposure (e.g. 24 hr period).
   Maximum average increase of 5 mg/L from background levels for longer term exposures (eg. inputs lasting between 24 hrs and 30 days).
   High Flow:
   Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L.
   Should not increase more than 10% of background levels when background is >250 mg/L.

Bold	- Exceedance of MSWQOG
	- Exceedance of CCME Criteria

TABLE 5
METALS IN WATER

Sample ID	Date	Duplicate ID	Water Source	Parameter [1]																
				Aluminum	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Magnesium	Manganese	Mercury
EG-1	3-Jun-20		South Lake	0.32	<0.0060	0.0028	<0.10	<0.010	<0.20	<0.00020	8.8	<0.010	<0.0030	<0.0020	2.6	<0.0020	<0.20	2.6	0.24	<0.00019
EG-2	3-Jun-20		Peat	0.93	<0.0060	0.0022	<0.10	<0.010	<0.20	<0.00020	3.5	<0.010	<0.0030	<0.0020	2.3	0.0021	<0.20	<2.0	0.059	<0.00019
EG-3	3-Jun-20		North Lake	0.14	<0.0060	<0.0020	<0.010	<0.010	<0.020	<0.00020	5.0	<0.010	<0.0030	<0.0020	0.38	<0.0020	<0.020	2.5	0.024	<0.00019
EG-4	3-Jun-20		Peat	0.22	<0.0060	<0.0020	<0.010	<0.010	<0.020	<0.00020	2.8	<0.010	<0.0030	<0.0020	0.27	<0.0020	<0.020	1.6	0.017	<0.00019
EG-5	4-Jun-20		Creek/Low Area	0.011	<0.00060	0.00077	<0.010	<0.0010	<0.020	<0.000020	27	<0.0010	<0.00030	0.0020	<0.060	<0.00020	<0.020	8.4	0.050	<0.00019
		SW-100		0.015	<0.00060	0.0010	<0.010	<0.0010	<0.020	<0.000020	25	<0.0010	<0.00030	0.00047	<0.060	<0.00020	<0.020	7.6	0.045	<0.00019
EG-6	4-Jun-20		Drainage Ditch	0.16	<0.00060	0.0030	<0.010	<0.0010	0.020	<0.000020	120	0.0013	0.00043	0.0024	1.6	<0.00020	<0.020	24	0.067	<0.00019
Field Blank	4-Jun-20			0.0055	<0.00060	<0.00020	<0.010	<0.0010	<0.020	<0.000020	<0.30	0.0011	<0.00030	<0.00020	<0.060	<0.00020	<0.020	<0.20	<0.0040	<0.00019
Laboratory Detection Limits				0.0030/ 0.030	0.00060/ 0.0060	0.00020/ 0.0020	0.010/ 0.10	0.0010/ 0.010	0.020/ 0.20	0.000020/ 0.00020	0.30/ 3.0	0.0010/ 0.010	0.00030/ 0.0030	0.00020/ 0.0020	0.060/ 0.60	0.00020/ 0.0020	0.020/ 0.20	0.20/ 2.0	0.0040/ 0.040	0.00019
Manitoba Water Quality Standards, Objectives, and Guidelines [2]																				
Freshwater Aquatic Life				0.005 - 0.1 [4]	-	[5]	-	-	1.5 - 29 [6]	[8a]	-	-	-	[8b]	0.3	[8c]	-	-	-	0.000026 (Inorganic)
CCME[3]																				
Freshwater Aquatic Life				0.005 - 0.1 [10]	-	0.005	-	-	29 [12] 1.5 [13]	0.00009[7a] 0.001[7b]	-	0.0089 (III)[11] 0.001 (VI)	-	[7c]	0.3	[7d]	-	-	0.430[17a]/3.600[17b]	0.000026 (inorganic) 0.000004 (methyl)[14]

Sample ID	Date	Duplicate ID	Water Source	Parameter [1]															
				Molybdenum	Nickel	Phosphorus	Potassium	Selenium	Silicon	Silver	Sodium	Strontium	Sulphur	Thallium	Tin	Titanium	Uranium	Vanadium	Zinc
EG-1	3-Jun-20		South Lake	<0.0020	<0.0050	<1.0	<3.0	<0.0020	3.8	<0.0010	<5.0	<0.20	<2.0	<0.0020	<0.010	<0.010	<0.0010	<0.010	<0.030
EG-2	3-Jun-20		Peat	<0.0020	<0.0050	<1.0	<3.0	<0.0020	5.8	<0.0010	<5.0	<0.20	<2.0	<0.0020	<0.010	<0.010	<0.0010	<0.010	<0.030
EG-3	3-Jun-20		North Lake	<0.0020	<0.0050	<0.10	0.99	<0.0020	0.25	<0.0010	0.61	<0.020	1.1	<0.0020	<0.010	<0.010	<0.0010	<0.010	<0.030
EG-4	3-Jun-20		Peat	<0.0020	<0.0050	<0.10	0.74	<0.0020	1.4	<0.0010	0.54	<0.020	0.48	<0.0020	<0.010	<0.010	<0.0010	<0.010	<0.030
EG-5	4-Jun-20		Creek/Low Area	<0.00020	<0.00050	<0.10	1.3	<0.00020	4.9	<0.00010	1.3	0.037	0.72	<0.00020	<0.0010	<0.0010	<0.00010	<0.0010	0.0037
		SW-100		<0.00020	0.0012	<0.10	1.2	<0.00020	4.4	<0.00010	1.2	0.034	0.66	<0.00020	<0.0010	<0.0010	<0.00010	<0.0010	0.0085
EG-6	4-Jun-20		Drainage Ditch	0.0011	0.0040	<0.10	1.7	<0.00020	4.1	<0.00010	2.4	0.14	5.2	<0.00020	<0.0010	0.0089	0.0024	0.0021	0.0083
Field Blank	4-Jun-20			<0.00020	0.00085	<0.10	<0.30	<0.00020	0.16	<0.00010	<0.50	<0.020	<0.20	<0.00020	<0.0010	<0.0010	<0.00010	<0.0010	0.0031
Laboratory Detection Limits				0.00020/ 0.0020	0.00050/ 0.0050	0.10/ 1.0	0.30/ 3.0	0.00020/ 0.0020	0.10/ 1.0	0.00010/ 0.0010	0.50/ 5.0	0.020/ 0.20	0.20/ 2.0	0.00020/ 0.0020	0.0010/ 0.010	0.0010/ 0.010	0.00010/ 0.0010	0.0010/ 0.010	0.0030/ 0.030
Manitoba Water Quality Standards, Objectives, and Guidelines [2]																			
Freshwater Aquatic Life				0.073	[8d]	-	-	0.001	-	0.0001	-	-	-	0.0008	-	-	0.015 - 0.033[9]	-	[8e]
CCME[3]																			
Freshwater Aquatic Life				0.073[11]	[7e]	[15]	-	0.001	-	0.00025[16]	-	-	-	0.0008	-	-	0.033[12] 0.015[13]	-	0.037 [12a] 0.007 [13a]

Notes:
"-" = No Data

1. All values are expressed in milligrams per litre (mg/L) unless otherwise specified.
2. Manitoba Water Quality Standards, Objectives, and Guidelines, Manitoba Water Stewardship, November 28 2011.
3. CCME - Canadian Council of Ministers of the Environment. Canadian Environmental Quality Guidelines, 1999. Updated December 2019.
   Canadian Water Quality Guidelines for the Protection of Aquatic Life
4. If pH<6.5, guideline is 0.005. If pH>6.5, guideline is 0.1.
5. Arsenic Tier II Objectives:
   0.15 mg/L = Duration 4 Days, Not more than once each 3 years, on average
   0.34 mg/L = Duration 1 Hour, Not more than once each 3 years, on average
6. Short-term exposure = 29 mg/L; Long-term exposure = 1.5 mg/L.

TABLE 5
METALS IN WATER

7. Guideline is variable based on hardness and is calculated with equations. For the following equations, hardness is expressed as $CaCO_3$ in mg/L and the guideline is in mg/L exposure:

		Hardness Range (mg/L)	Sample Hardness	Guideline (mg/L)
Cadmium	Long-Term [a]	50		0.00009
		0-16		0.00004
		17-280		#NUM!
		>280		0.00037
	Short-Term [b]	50		0.001
		0-5.2		0.00011
		5.3-360		#NUM!
		>360		0.0077
Copper [c]		0-81		0.002
		82-180		#NUM!
		>180		0.004
		Unknown		0.002
Lead [d]		0-60		0.001
		61-180		#NUM!
		>180		0.007
		Unknown		0.001
Nickel [e]		0-60		0.025
		61-180		#NUM!
		>180		0.15
		Unknown		0.025

			Cadmium		Copper[c]	Lead[d]	Nickel [e]
Sample ID	Duplicate ID	Hardness as $CaCO_3$	Long-Term[a]	Short-Term[b]			
EG-1		34	0.00006	0.00070	$0.00094	$0.00081	$0.04210
EG-2		8.1	0.00002	0.00016	$0.00028	$0.00013	$0.01415
EG-3		23	0.00005	0.00047	$0.00067	$0.00049	$0.03128
EG-4		14	0.00003	0.00028	$0.00044	$0.00026	$0.02145
EG-5		100	0.00016	0.00210	$0.00236	$0.00318	$0.09558
	SW-100	96	0.00015	0.00201	$0.00228	$0.00302	$0.09266
EG-6		400	0.00050	0.00858	$0.00773	$0.01858	$0.27411
Field Blank		<0.50	N/A	N/A	N/A	N/A	N/A
Formulas:	Cadmium	Long-Term	=(10^(0.83*(LOG(J54))-2.46))/1000				
		Short-Term	=(10^(1.016*(LOG(J54))-1.71))/1000				
	Copper		=(EXP(0.8545*(LN(J54))-1.465)*0.2)/1000				
	Lead		=(EXP(1.273*(LN(J54))-4.705))/1000				
	Nickel		=(EXP(0.76*(LN(J54))+1.06))/1000				

8. Tier II - Water Quality Objectives, Manitoba Water Quality Standards, Objectives, and Guidelines, Manitoba Water Stewardship, November 28 2011.
Guideline is variable based on hardness and is calculated with equations. For the following equations, hardness is expressed as CaCO3 in mg/L and the guideline is in mg/L exposure.

			Cadmium [a]		Copper [b]		Lead [c]		Nickel [d]		Zinc [e]	
Sample	Duplicate ID	Hardness	4 Days	1 Hour	4 Days	1 Hour	4 Days	1 Hour	4 Days	1 Hour	4 Days	1 Hour
EG-1		34	0.00012	0.00070	0.00356	0.00486	0.00076	0.01961	0.02088	0.18797	0.04736	0.04698
EG-2		8.1	0.00004	0.00017	0.00105	0.00126	0.00015	0.00385	0.00620	0.05585	0.01405	0.01393
EG-3		23	0.00009	0.00048	0.00255	0.00337	0.00049	0.01264	0.01500	0.13505	0.03401	0.03373
EG-4		14	0.00006	0.00030	0.00167	0.00211	0.00028	0.00720	0.00986	0.08873	0.02233	0.02215
EG-5		100	0.00025	0.00201	0.00896	0.01344	0.00252	0.06458	0.05201	0.46824	0.11814	0.11718
	SW-100	96	0.00024	0.00193	0.00865	0.01293	0.00241	0.06177	0.05024	0.45234	0.11412	0.11320
EG-6		400	0.00064	0.00773	0.02928	0.04962	0.01094	0.28085	0.16804	1.51289	0.38240	0.37930
Field Blank		<0.50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Formulas:	Cadmium	4 Days	(EXP(0.7409*(LN(C80))-4.719)*((1.101672-((LN(C80)*(0.041838))))))/1000									
		1 Hour	(EXP(1.0166*(LN(C80))-3.925)*(1.136672-((LN(C80)*(0.041838)))))/1000									
	Copper	4 Days	(EXP(0.8545*(LN(C80))-1.702))*0.96/1000									
		1 Hour	(EXP(0.9422*(LN(C80))-1.7))*0.96/1000									
	Lead	4 Days	EXP(1.273*(LN(C80))-4.705)*((1.46203-((LN(C80)*(0.145712)))))/1000									
		1 Hour	EXP(1.273*(LN(C80))-1.46)*((1.46203-((LN(C80)*(0.145712)))))/1000									
	Nickel	4 Days	(EXP(0.846*(LN(C80))+0.0584))*0.997/1000									
		1 Hour	(EXP(0.846*(LN(C80))+2.255))*0.998/1000									
	Zinc	4 Days	(EXP(0.8473*(LN(C80))+0.884))*0.986/1000									
		1 Hour	(EXP(0.8473*(LN(C80))+0.884))*0.978/1000									
	Tier II - Water Quality Objectives for most metals are comprised of two factors - the first represents the toxicity of the total recoverable of the metal and, when necessary, expressed as a relationship with hardness. This is then multiplied by a second factor to convert the final Tier II - Water Quality Objective to a dissolved metal fraction.											

9. Short-term exposure = 0.033 mg/L; Long-term exposure = 0.015 mg/L
10. Total aluminum should not exceed 0.005 mg/L in waters with a pH below 6.5.
The concentration of total aluminum should not exceed 0.1 mg/L in waters with a pH greater or equal to 6.5.

TABLE 5
METALS IN WATER

11. Interim Water Quality Guideline.
12. Short-term exposure (24 to 96 hours) concentrations which indicate potential for severe effects during transient events (spill events to aquatic receiving environments and infrequent releases of short-lived/non-persistent substances). These are NOT protective guidelines.
    a. The short-term benchmark is for dissolved zinc and is calculated using the following equation: Benchmark = $\exp(0.833[\ln(\text{hardness mg}\cdot\text{L}^{-1})] + 0.240[\ln(\text{DOC mg}\cdot\text{L}^{-1})] + 0.526)$.
    The value in the table is for surface water of 50 mg CaCO3·L−1 hardness and 0.5 mg·L−1 dissolved organic carbon (DOC). The benchmark equation is valid between hardness 13.8 and 250.5 mg CaCO3·L−1 and DOC 0.3 and 17.3 mg·L−1. (value is in µg/L)
13. Long-term exposure guideline that protects all forms of aquatic life for indefinite exposure periods (>7 day exposures for fish and invertebrates, 24 hour exposures for aquatic plants and algae).
    a. The long-term CWQG is for dissolved zinc and is calculated using the following equation: CWQG = $\exp(0.947[\ln(\text{hardness mg}\cdot\text{L}^{-1})] - 0.815[\text{pH}] + 0.398[\ln(\text{DOC mg}\cdot\text{L}^{-1})] + 4.625)$.
    The value in the table is for surface water of 50 mg CaCO3·L−1 hardness, pH of 7.5 and 0.5 mg·L−1 DOC. The CWQG equation is valid between hardness 23.4 and 399 mg CaCO3·L−1, pH 6.5 and 8.13 and DOC 0.3 to 22.9 mg·L−1. (value is in µg/L)
14. Interim Guideline - may not fully protect high trophic level fish.
15. If trigger ranges for total phosphorous are exceeded, the potential exists for an environmental impact. If trigger range is not exceeded, but TP is more than 50% above baseline values, the potential exists for an environmental impact.

Trigger ranges (mg/L):	ultra-oligotrophic	<0.004	meso-eutrophic	0.020-0.035
	oligotrophic	0.004-0.010	eutrophic	0.035-0.10
	mesotrophic	0.010-0.020	hyper-eutrophic	>0.10

16. This guideline is not applicable to silver nanoparticles and was derived based on the total concentration of silver.
17. These values are for a water hardness of 50 mg/L as CaCO3 and pH 7.5. The freshwater benchmark equation and the CWQG look-up table must be used in order to obtain a site-specific benchmark and CWQG, respectively,based on the hardness and pH of the water body of interest. Note that it is not appropriate to apply the manganese freshwater guidelines to marine or estuarine environments. Both the benchmark and guideline values were derived for dissolved manganese in order to represent the bioavailable form.
    a. The CWQG for manganese (i.e. long-term guideline) is found using the CWQG calculator in Appendix B of the Scientific Criteria Document for the Development of the Canadian Water Quality Guidelines for the Protection of Aquatic Life: Manganese.
    The long-term CWQG is for dissolved manganese and is found manually using the look-up table below or using the CWQG and benchmark calculator (Appendix B). The CWQG table is valid between hardness of 25 and 670 mg/L and pH 5.8 and 8.4, which are the ranges of data used to derive the hardness and pH slopes.
    b. The short-term benchmark is calculated using the benchmark calculator in Appendix B of the Scientific Criteria Document for the Development of the Canadian Water Quality Guidelines for the Protection of Aquatic Life: Manganese or the following equation:
    Benchmark = $\exp(^{0.878[\text{kb(hardness)}]+4.76})$ where the benchmark is expressed in dissolved manganese concentration (µg/L), and hardness is measured as CaCO3 equivalents in mg/L.
    The benchmark equation is valid between hardness of 25 and 250 mg/L, which is the range of data used to derive the hardness slope.

	- Exceedance of CCME Criteria
BOLD	- Exceedance of MWQSOG Criteria

TABLE 6
VEGETATION SPECIES LIST

Species		Ranking			Protection		
Common Name	Latin Name	Provincial	National	Global	The Endangered Species and Ecosystems Act	Species At Risk Act	COSEWIC
Trees							
Balsam fir	Abies balsamea	S5	N5	G5	-	-	-
Paper (white) birch	Betula papyrifera	S5	N5	G5	-	-	-
Tamarak (American larch)	Larix laricina	S5	N5	G5	-	-	-
Black spruce	Picea mariana	S5	N5	G5	-	-	-
Jack pine	Pinus banksiana	S5	N5	G5	-	-	-
Balsam poplar	Populus balsamifera	S5	N5	G5T5	-	-	-
Shrubs							
Speckled alder (River Alder)	Alnus incana ssp. rugosa	S5	N5	G5T5	-	-	-
Green alder	Alnus viridis	S5	N5	G5	-	-	-
Saskatoon	Amelanchier alnifolia	S5	N5	G5	-	-	-
Bog rosemary	Andromeda polifolia	S5	N5	G5	-	-	-
Bog birch	Betula glandulosa	S5	N5	G5	-	-	-
Leather leaf	Chamaedaphne calyculata	S5	N5	G5	-	-	-
Red-osier dogwood	Cornus sericea	S5	N5	G5T5	-	-	-
Northern bush-honeysuckle	Diervilla lonicera	S5	N5	G5	-	-	-
Creeping snowberry	Gaultheria hispidula	S4S5	N5	G5	-	-	-
Pale (Bog) laurel	Kalmia polifolia	S5	N5	G5	-	-	-
Sweet bayberry	Myrica gale	S5	N5	G5	-	-	-
Common Labrador tea	Rhododendron groenlandicum	S5	N5	G5	-	-	-
Northern black currant	Ribes hudsonianum	S5	N5	G5	-	-	-
Swamp Red Currant	Ribes triste	S5	N5	G5	-	-	-
Prickly rose	Rosa acicularis	S5	N5	G5	-	-	-
Raspberry	Rubus idaeus	S5	N5	G5	-	-	-
Bebb's willow	Salix bebbiana	S5	N5	G5	-	-	-
Pussy willow	Salix discolor	S5	N5	G5	-	-	-
Sandbar willow	Salix interior	S5	N5	G5	-	-	-
Balsam willow	Salix pyrifolia	S4S5	N5	G5	-	-	-
Showy Mountain-ash	Sorbus decora	S4	N5	G5	-	-	-
Late lowbush blueberry	Vaccinium angustifolium	S4	N5	G5	-	-	-
Velvetleaf blueberry	Vaccinium myrtilloides	S5	N5	G5	-	-	-
Mountain cranberry (lingonberry)	Vaccinium vitis-idaea	S5	N5	G5	-	-	-
Herbaceous							
Wild calla (Water arum)	Calla palustris	S5	N5	G5	-	-	-
Marsh marigold	Caltha palustris	S5	N5	G5	-	-	-
Fireweed	Chamerion angustifolium	S5	N5	G5	-	-	-
Prince's-pine	Chimaphila umbellata	S4S5	N5	G5	-	-	-
Spotted Water-hemlock	Cicuta maculata	S4S5	N5	G5	-	-	-
Bluebead lily	Clintonia borealis	S4	N5	G5	-	-	-
Goldthread	Coptis trifolia	S4S5	N5	G5	-	-	-
Dwarf dogwood (Bunchberry)	Cornus canadensis	S5	N5	G5	-	-	-
Stemless lady's slipper	Cypripedium acaule	S3S4	N5	G5	-	-	-
Round-leaved Sundew	Drosera rotundifolia	S4S5	N5	G5	-	-	-
Wild strawberry	Fragaria vesca	S4S5	N5	G5	-	-	-
Northern bedstraw	Galium boreale	S5	N5	G5	-	-	-
Sweet-scented bedstraw	Galium triflorum	S5	N5	G5	-	-	-
Northern comandra	Geocaulon lividum	S5	N5	G5	-	-	-
Seaside Crowfoot	Halerpestes cymbalaria	S5	N5	G5	-	-	-
Blueflag	Iris versicolor	S3S4	N5	G5	-	-	-
Northern starflower	Lysimachia borealis	S5	N5	G5	-	-	-
Tufted loosestrife	Lysimachia thyrsiflora	S5	N5	G5	-	-	-
Wild lily-of-the-valley	Maianthemum canadense	S5	N5	G5	-	-	-
Three-leaved false Solomon's seal	Maianthemum trifolium	S5	N5	G5	-	-	-
Wild mint	Mentha canadensis	S5	N5	G5	-	-	-
Naked bishop's cap	Mitella nuda	S5	N5	G5	-	-	-
Small yellow pond-lily	Nuphar microphylla	S3S4	N4N5	G5T4T5	-	-	-
Water smartweed	Persicaria amphibia	S5	N5	G5	-	-	-
Palmate-leaved colt's-foot	Petasites frigidus var. palmatus	S5	N5	G5T5	-	-	-
Arrowleaf sweet-colt's-foot	Petasites frigidus var. sagittatus	S5	N5	G5	-	-	-
Blunt leaved bog-orchid	Platanthera obtusata	S5	N5	G5	-	-	-
Alderleaf buckthorn	Rhamnus alnifolia	S5	N5	G5	-	-	-
Cloudberry	Rubus chamaemorus	S5	N5	G5	-	-	-
Dwarf raspberry	Rubus pubescens	S5	N5	G5	-	-	-
Northern pitcher plant	Sarracenia purpurea	S4S5	N5	G5	-	-	-
Water parsnip	Sium suave	S5	N5	G5	-	-	-
Marsh hedge-nettle	Stachys palustris	SNR	N5	G5	-	-	-
Long-leaved stitchwort	Stellaria longifolia	S5	N5	G5	-	-	-
Small cranberry	Vaccinium oxycoccos	S5	N5	G5	-	-	-

Species		Ranking			Protection		
Common Name	Latin Name	Provincial	National	Global	The Endangered Species and Ecosystems Act	Species At Risk Act	COSEWIC
American vetch	Vicia americana	S5	N5	G5	-	-	-
Canada violet	Viola canadensis	S5	N5	G5	-	-	-
Northern bog violet	Viola nephrophylla	S5	N5	G5	-	-	-
Graminoid							
Bluejoint	Calamagrostis canadensis	S5	N5	G5	-	-	-
Water sedge	Carex aquatilis	S5	N5	G5	-	-	-
Short sedge	Carex canescens	S5	N5	G5	-	-	-
Dewey's sedge	Carex deweyana	S5	N5	G5	-	-	-
Northern bog sedge	Carex gynocrates	S5	N5	G5	-	-	-
Mud sedge	Carex limosa	S5	N5	G5	-	-	-
Beaked sedge	Carex rostrata	S4	N5	G5	-	-	-
Narrowleaf cotton-grass	Eriophorum angustifolium	S5	N5	G5	-	-	-
White-grained Mountain-ricegrass	Oryzopsis asperifolia	S5	N5	G5	-	-	-
Broad-leaved cattail	Typha latifolia	S4S5	N5	G5	-	-	-
Moss, ferns and bryophytes							
Spinulose shield fern	Dryopteris carthusiana	S5	N5	G5	-	-	-
Common horsetail	Equisetum arvense	S5	N5	G5	-	-	-
Stiff club moss	Lycopodium annotinum	S5	N5	G5	-	-	-
Ground pine	Lycopodium obscurum	S4	N5	G5	-	-	-
Red-stemmed Feather Moss	Pleurozium schreberi	S4S5	N5	G5	-	-	-
Knight's-plume moss	Ptilium crista-castrensis	S4S5	N5	G5	-	-	-
Peat moss	Sphagnum sp.	S5	N5	G5	-	-	-
Non-native species							
Smooth brome	Bromus inermis	SNA	NNA	G5T5	-	-	-
Canada thistle	Cirsium arvense	SNA	NNA	G5	-	-	-
Quack grass	Elymus repens	SNA	NNA	GNR	-	-	-
Black medic	Medicago lupulina	SNA	NNA	GNR	-	-	-
Yellow sweet clover	Melilotus officinalis	SNA	NNA	GNR	-	-	-
Common dandelion	Taraxacum officinale	SNA	NNA	G5T5	-	-	-
Alsike clover	Trifolium hybridum	SNA	NNA	GNR	-	-	-

Notes:

Provincial Status (S-Rank) and National Statis (N-Rank): S1/N1 = Critically Imperiled, S2/N2 = Imperiled, S3/N3 = Vulnerable, S4/N4 = Apparently Secure, S5/N5 = Secure, SNA = Conservation status not applicable

Global Status (G-rank): G1= Critically Imperiled, G2= Imperiled, G3= Vulnerable, G4= Apparently Secure, G5= Secure, G#G# indicates range of uncertainty in status.

Status modifiers: For a migratory species B = rank applies to the breeding population in the province, N = rank applies to the non-breeding population in the province, M = rank applies to the transient population, U = unrankable, T - Infraspecific taxon

Protection descriptors: SC = Special Concern, - = No protection designation assigned

TABLE 7
WILDLIFE SPECIES LIST

Species		Ranking			Protection		
Common Name	Latin Name	Provincial	National	Global	The Endangered Species and Ecosystems Act	Species At Risk Act	COSEWIC
Amphibians							
American toad	Anaxyrus americanus	S5	N5	G5	-	-	-
Leopard frog	Lithobates pipiens	S4	N5	G5	-	SC	SC
Spring peeper	Pseudacris crucifer	S5	N5	G5	-	-	-
Boreal chorus frog	Pseudacris maculata	S5	N5	G5	-	-	-
Mammals							
Gray (Timber) wolf	Canis lupus	S5	N5	G5	-	-	-
Beaver	Castor canadensis	S5	N5	G5	-	-	-
Porcupine	Erethizon dorsatum	S5	N5	G5	-	-	-
White-tailed deer	Odocoileus virginianus	S5	N5	G5	-	-	-
Muskrat	Ondatra zibethicus	S5	N5	G5	-	-	-
Red squirrel	Tamiasciurus hudsonicus	S5	N5	G5	-	-	-
Black bear	Ursus americanus	S5	N5	G5	-	-	-
Avian							
Mallard	Anas platyrhynchos	S5B	N5B,N5N,N5M	G5	-	-	-
Great Blue Heron	Ardea herodias	S5B	N5B,N3N,N5M	G5	-	-	-
Cedar Waxwing	Bombycilla cedrorum	S5B,SUN	N5B,N5N,N5M	G5	-	-	-
Ruffed Grouse	Bonasa umbellus	S4S5	N5	G5	-	-	-
Common Goldeneye	Bucephala clangula	S5B,SUN	N5B,N5N,N5M	G5	-	-	-
Veery	Catharus fuscescens	S5B	N5B,N5M	G5	-	-	-
Hermit Thrush	Catharus guttatus	S5B	N5B,NUN,N5M	G5	-	-	-
Common Raven	Corvus corax	S5	N5	G5	-	-	-
Blue Jay	Cyanocitta cristata	S5	N5B,N5N,NNRM	G5	-	-	-
Pileated Woodpeacker	Dryocopus pileatus	S5	N5	G5	-	-	-
Alder Flycatcher	Empidonax alnorum	S5B	N5B,N5M	G5	-	-	-
Rusty Blackbird	Euphagus carolinus	S4B	N4B,NUN,N4M	G4	-	SC	SC
Spruce Grouse	Falcipennis canadensis	S4	N5	G5	-	-	-
Common Yellowthroat	Geothlypis trichas	S5B	N5B,N5M	G5	-	-	-
Sandhill Crane	Grus canadensis	S5B	N5B,N1N,N5M	G5	-	-	-
Dark-Eyed Junco	Junco hyemalis	S5B,SUN	N5B,N5N,N5M	G5	-	-	-
Swamp Sparrow	Melospiza georgiana	S5B	N5B,NUN,N5M	G5	-	-	-
Song Sparrow	Melospiza melodia	S5B	N5B,N5N,N5M	G5	-	-	-
Connecticuit Warbler	Oporornis agilis	S4B	N5B,N4N5M	G4G5	-	-	-
Gray Jay	Perisoreus canadensis	S5	N5B,N5N,NUM	G5	-	-	-
American Three-Toed Woodpecker	Picoides dorsalis	S5	N5B,N5N,NUM	G5	-	-	-
Golden-Crowned Kinglet	Regulus satrapa	S4B	N5B,N5N,N5M	G5	-	-	-
Ovenbird	Seiurus aurocapilla	S5B	N5B,N5M	G5	-	-	-
Yellow-Rumped Warbler	Setophaga coronata	S5B	N5B,N4N,N5M	G5	-	-	-
Chestnut-Sided Warbler	Setophaga pensylvanica	S5B	N5B,N5M	G5	-	-	-
American Yellow Warbler	Setophaga petechia	S5B	N5B,N5M	G5	-	-	-
Cape May Warbler	Setophaga tigrina	S5B	N5B,N5M	G5	-	-	-
Black-Throated Green Warbler	Setophaga virens	S4B	N5B,N5M	G5	-	-	-
Red-Breasted Nuthatch	Sitta canadensis	S5	N5B,N5N,N5M	G5	-	-	-
Pine Siskin	Spinus pinus	S5	N5B,N5N,N5M	G5	-	-	-
American Goldfinch	Spinus tristis	S5B	N5B,N5N,N5M	G5	-	-	-
American Robin	Turdus migratorius	S5B	N5B,N4N5N,N5M	G5	-	-	-
Mourning Dove	Zenaida macroura	S4B	N5B,N5N,N5M	G5	-	-	-
White-Throated Sparrow	Zonotrichia albicollis	S5B	N5B,N5N,N5M	G5	-	-	-

Notes:
Provincial Status (S-Rank) and National Statis (N-Rank): S1/N1 = Critically Imperiled, S2/N2 = Imperiled, S3/N3 = Vulnerable, S4/N4 = Apparently Secure, S5/N5 = Secure, SNA = Conservation status not applicable

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Status modifiers: For a migratory species B = rank applies to the breeding population in the province, N = rank applies to the non-breeding population in the province, M = rank applies to the transient population, U = unrankable, T - Infraspecific taxon
Protection descriptors: SC = Special Concern, - = No protection designation assigned

TABLE 8
FISH CAPTURE INFORMATION FOR MINNOW TRAPS

Location	Sample ID	Set Duration (hrs)	Fish Captured	Fish Species			Total
				Central Muddminnow	Brook Stickleback	Northern Redbelly Dace	
EG-1	MT-1	22.72	Yes	1	0	0	1
	MT-2	22.63	No	0	0	0	0
	MT-3	22.53	No	0	0	0	0
	MT-4	22.58	No	0	0	0	0
	MT-5	22.5	Yes	2	0	0	2
EG-2	MT-6	21.58	No	0	0	0	0
	MT-7	21.43	Yes	1	0	0	1
	MT-8	21.5	Yes	0	28	1	29
	MT-9	21.42	No	0	0	0	0
	MT-10	21.42	Yes	2	1	0	3
			Total	6	29	1	36

Note:
MT = Minnow Trap

TABLE 11
CATEGORIES OF ADVERSE BIOPHYSICAL, SOCIO-ECONOMIC AND CULTURAL EFFECTS

Adversity Category	Biophysical	Socio-Economic	Physical and Cultural Heritage
Negligible	Effect on the population or a specific group of individuals at a local project area and/or over a short period in such a way as to be similar to small random changes in the population due to environmental irregularities but having no measurable effect on the population as a whole.	Effect of either very short duration or affects a small group of people or which occurs in the local project area in a manner similar to small random changes to extraneous irregularities, but having no measurable effect on the population as a whole.	Effect on physical and cultural heritage resources of short duration and in the local project area. The effect on physical and cultural resources is not detectable. The resources are not publicly recognized or protected by legislation.
Minor	Effect on a specific group of individuals in a population in the project area and/or over a short period (one generation or less), but not affecting other trophic levels or the integrity of the population itself.	Effect either of short-term duration or affects a specific group of people in the local project area but not necessarily affecting the integrity of the entire group itself.	Effect on physical and cultural heritage resources of short duration but over the adjacent local area. The effect on physical and cultural resources is minor or repairable. The resources are publicly recognized but not protected by legislation.
Moderate	Effect on a portion of a population that results in a change in abundance and/or distribution over one or more generations of that portion of the population or any population dependent upon it, but does not change the integrity of any population as a whole. The effect may be localized.	Effect either of medium-term duration (which affects one or two generations and/or the portion of the population dependent upon it) or affects a moderate portion of the population without affecting the integrity of the population as a whole.	Effects on physical and cultural heritage resources of moderate duration. Resources affected over the adjacent local area. The effect on physical and cultural resources is reversible. The resources are protected by legislation.
Major	Effect on a whole stock or population of a species in sufficient magnitude to cause a decline in abundance and/or change in distribution beyond which natural recruitment would not return that population or species dependent upon it, to its former level within several generations.	Effect either of long duration (lasting several generations) or affecting an entire definable group of people in sufficient magnitude to cause severe change in economic, physical or psychological well-being or long established activity patterns that would not return to pre-project levels or patterns within several generations.	Effect on physical and cultural heritage resources of long duration. Resources affected over large regional area. There is an irreversible effect on physical/cultural resources. The resources are protected by legislation.

TABLE 12
CRITERIA AND RATINGS FOR EVALUATING SIGNIFICANCE

Criteria	Rating		
	1	2	3
a) Societal value of the affected environmental components – includes nature and degree of protection provided	Not valuable (no designation)	Moderately valuable (designated or protected locally, regionally or provincially)	Highly valuable (designated or protected nationally or internationally)
b) Ecological value – includes rarity and uniqueness, fragility, importance within ecosystem, importance to scientific studies	Not valuable	Moderately valuable	Highly valuable
c) Duration – length of time the project activity will last	Short-term (less than 1 year)	Moderate (between 1 and 100 years)	Long-term (more than 100 years)
d) Frequency – rate of reoccurrence of the project activity causing the effect	Rarely (less than once per year)	Sporadically (less than once per month)	Frequently (more than once per week)
e) Geographic extent – area over which the effect will occur	Single point	Localized	Regional or greater
f) Magnitude – predicted disturbance compared to existing conditions	No measurable disturbance	Measurable disturbance but no loss of function	Measurable disturbance with loss of function
g) Reversibility – time the environmental component will take to recover after the source of the effect ceases	Less than a year	Between 1 and 100 years	Irreversible

TABLE 13
ESTIMATED GREENHOUSE GAS EMISSIONS

Production Year	Area (ha)				Area (km^2)		Annual GHG from Land Use Change (tonne - CO^2 equivalent)		
	Opened	Closed	Harvesting	Total Disturbed	Harvesting	Cummulative Restoration (1)	Harvesting Activities (2)	Restoration Activities (3)	Total
2020	0	0	0	0	0	0	0	0	0
2021	60	0	60	60	0.6	0	637	0	637
2022	0	0	60	60	0.6	0	637	0	637
2023	0	0	60	60	0.6	0	637	0	637
2024	0	0	60	60	0.6	0	637	0	637
2025	0	0	60	60	0.6	0	637	0	637
2026	0	0	60	60	0.6	0	637	0	637
2027	0	0	60	60	0.6	0	637	0	637
2028	0	0	60	60	0.6	0	637	0	637
2029	0	0	60	60	0.6	0	637	0	637
2030	0	0	60	60	0.6	0	637	0	637
2031	0	0	60	60	0.6	0	637	0	637
2032	0	0	60	60	0.6	0	637	0	637
2033	0	0	60	60	0.6	0	637	0	637
2034	0	0	60	60	0.6	0	637	0	637
2035	0	0	60	60	0.6	0	637	0	637
2036	0	0	60	60	0.6	0	637	0	637
2037	0	0	60	60	0.6	0	637	0	637
2038	0	60	0	60	0	0.6	0	773	773
2039	0	0	0	60	0	0.6	0	773	773
2040	0	0	0	60	0	0.6	0	773	773
2041	0	0	0	60	0	0.6	0	773	773
2042	0	0	0	60	0	0.6	0	773	773
2043	0	0	0	60	0	0	0	0	0
Totals							10,822	3,864	14,686

Notes:

1 - Assumes that a restored field returns to net neutral GHG flux 6 years after restoration (ie 5 years cummulative area)

2 - Calculated using the Cleary et. al. GHG Flux for Peatland Under Extraction of 1061 t / km^2 / yr

3 - Calculated using the Cleary et. al. GHG Flux for Cutover Peatland Under Restoration of 1288 t / km^2 / yr

TABLE 14

ENVIRONMENTAL EFFECTS ANALYSIS SUMMARY FOR THE PROPOSED PEAT DEVELOPMENT

Environmental Effect	Adversity (Table 11)	Mitigation Measures	Follow-up	Significance (S)* (see Table 12)							
				a	b	c	d	e	f	g	S
Microclimate											
Changes in airflow, wind speed and snow deposition pattern	Minor	Install snow fences to control snow deposition on the property if required	Observe for changes in airflow patterns and snow deposition periodically	1	2	2	2	2	2	2	N
Air Quality											
Increased fugitive dust from site preparation, construction, operation and reclamation activities	Moderate	Use approved dust suppressant Minimize peat handling activities during high wind events Reduce exposed peat area (harvesting fields and peat stockpiles) to prevailing winds Control vehicle speeds Instruct employees on proper harvest equipment operation to minimize dust Cover loads being hauled from the site Re-vegetate harvested areas Utilize windbreaks (tree and brush barriers)	Observe site periodically for fugitive dust levels Perform inspections of local area for accumulated dust Track public complaints	2	1	2	3	2	2	1	N
Increased levels of NO_x, SO_2, GHGs and VOCs from equipment/vehicle emissions during site preparation, peat harvesting and transporting activities, construction materials and fuel use	Minor	Use low sulphur fuels Require a high standard of maintenance of equipment and vehicles Limit unnecessary long-term idling Use appropriate fuel dispensing equipment	Perform periodic inspections of air quality during construction Record maintenance of heavy equipment Require submission of SDSs for all products used	2	1	2	3	2	2	1	N
Increased releases of GHGs into the atmosphere from clearing and peat-harvesting activities	Minor	Minimize the areas cleared Implement the Peatland Recovery Plan to restore the area to a carbon sink condition	Adhere to licence terms and conditions	3	1	2	3	2	1	2	N

Table 14 Cont'd

Environmental Effect	Adversity (Table 11)	Mitigation Measures	Follow-up	Significance (S)* (see Table 12)							
				a	b	c	d	e	f	g	S
Soils											
Loss and disturbance of surface soil during site preparation and harvesting activities	Major	Minimize the surface area disturbed Leave non-commercial peat reserves in place Implement the Peatland Recovery Plan to restore the area to natural conditions	Monitor annually and report on implementation of progressive restoration activities	1	2	2	3	2	3	3	N
Contamination of soils from leaks and accidental spills and releases of fuel or other hazardous substances	Moderate	Prevent leaks, spills and releases Require drip trays for equipment Designate re-fueling areas Ensure equipment arrives to site in good condition Provide spill clean-up equipment and materials Provide an emergency spill response plan Comply with fuel storage and dispensing regulations and storing hazardous materials in approved containers (secondary containment)	Perform periodic inspections for leaks, spills and releases Ensure construction and operation crews adhere to designated areas Remediate and record fuel spills and releases Adhere to licence terms and conditions Update the emergency spill response plan periodically	3	1	2	1	1	2	1	N
Groundwater											
Contamination of groundwater from leaks and accidental spills and releases of fuels or other hazardous substances	Minor	Prevent leaks, spills and releases Provide secondary containment for any temporary fuel storage Require drip trays for equipment Provide spill clean-up equipment and materials Provide an emergency spill response plan	Perform periodic inspections for leaks, spills and releases Update emergency response plan periodically Remediate and record fuel spills and releases Adhere to licence terms and conditions	3	1	2	1	1	1	2	N
Surface Water											
Loss of small intermittent ponds and drainage swales	Moderate	Minimize the area disturbed Maintain water levels on adjacent	Perform periodic inspections of surface waters	1	2	2	3	2	3	1	N

Table 14 Cont'd

Environmental Effect	Adversity (Table 11)	Mitigation Measures	Follow-up	Significance (S)* (see Table 12)							
				a	b	c	d	e	f	g	S
due to site drainage for peat harvesting operations		undisturbed lands Implement the Peatland Recovery Plan to restore pre-development water levels	Report annually on implementation of the restoration activities								
Modified surface water runoff flow rate and direction due to site drainage and land profiling activities during construction	Minor	None proposed	Monitor discharge flow rates from peat development according to licence terms and conditions	2	1	2	3	2	2	1	N
Increased suspended sediment levels in surface water	Minor	Install gated culvert to control water discharge and manage suspended sediment if required	Collect surface water samples from the outlet monthly for analysis of suspended sediment levels Clean drainage ditches and sedimentation ponds on a regular basis Perform periodic inspections for evidence of erosion Adhere to licence terms and conditions Conduct additional water monitoring if required in consultation with Manitoba Conservation	3	2	2	3	2	2	1	N
Alteration of surface water chemistry of downstream receiving waters	Minor	Install gated culvert to control water discharge if needed to manage suspended sediment If necessary, install a limestone or carbonate-lined drainage ditch to increase pH of draining bog water	Collect surface water samples from the outlet monthly for pH analysis Conduct additional water monitoring if required in consultation with Manitoba Conservation	3	2	2	3	2	1	1	N
Contamination of surface water from leaks and accidental spills and releases	Moderate	Prevent leaks, spills and releases Provide secondary containment for fuel storage	Perform periodic inspections for leaks, spills and releases Update the emergency response	3	2	2	1	1	2	2	N

Table 14 Cont'd

Environmental Effect	Adversity (Table 11)	Mitigation Measures	Follow-up	Significance (S)* (see Table 12)							
				a	b	c	d	e	f	g	S
of fuels or other hazardous substances		Require drip trays for equipment Provide spill clean-up equipment and materials Prepare an emergency spill response plan	plan periodically Remediate and record fuel spills and releases Adhere to licence terms and conditions								
Vegetation											
Loss and disturbance of terrestrial vegetation during site preparation and construction	Moderate	Minimize loss and disturbance of vegetation Protect vegetation along the perimeter of the cleared areas from blow-down Limit construction activities to designated areas Utilize timber removed from site Re-vegetate disturbed or reclaimed areas	Perform periodic inspections for vegetation stress and mortality around the cleared area Perform periodic inspections for invasion of nuisance or weed species Report annually on restoration activities implemented	1	2	2	3	2	2	2	N
Impairment of vegetation from dust accumulation during operation	Minor	Control dust using approved suppressant Curtail construction and operation during high wind events	Perform periodic inspections of local area for accumulated dust	1	2	2	2	2	1	1	N
Risk of fire during construction and operation	Major	Adhere to emergency response plan Provide fire suppression equipment on-site (extinguishers, shovels, hose, pumping equipment, etc.) Notify Manitoba Conservation and Climate immediately if a fire or explosion occurs	Examine firefighting equipment twice a month Conduct periodic testing, evaluation and updating of the emergency response plan Provide employee education and training in the use of this equipment regularly	2	3	1	1	3	2	2	N
Mammals / Habitat											
Loss and disturbance of mammal habitat during site preparation activities	Minor	Minimize loss and disturbance to vegetation Limit construction to area designated Limit operation activities to areas disturbed during construction	Perform periodic inspections during construction and operation Maintain re-vegetated areas Ensure adherence to environmental	1	2	2	2	2	2	2	N

Table 14 Cont'd

Environmental Effect	Adversity (Table 11)	Mitigation Measures	Follow-up	Significance (S)* (see Table 12)							
				a	b	c	d	e	f	g	S
		Re-vegetate disturbed or reclaimed areas	guidelines and protocols								
Loss and disturbance of large, small and burrowing mammals during construction and operation activities	Minor	Minimize the area of disturbance by limiting construction to designated areas Limit operation activities to areas disturbed during construction Maintain habitat around the sub-area Implement the Peatland Recovery Plan to restore wildlife habitat	Adhere to licence terms and conditions Maintain re-vegetated areas	1	2	2	3	2	2	2	N
Increased wildlife-vehicle interactions during peat transportation	Minor	Operate trucks during daylight hours Provide wildlife awareness information to drivers Adhere to posted speed limits	Maintain records of vehicle-wildlife interactions	1	1	2	3	3	1	2	N
Attraction of problem or nuisance animals	Minor	Regular disposal of waste at existing waste facilities Use animal deterrents such as noise-makers, reflectors and scents if required	Maintain records of problem or nuisance wildlife Adhere to licence terms and conditions	1	1	2	3	2	1	1	N
Birds / Habitat											
Loss and disturbance of bird habitat during site preparation activities	Minor	Minimize loss and disturbance of vegetation Limit construction to designated areas Limit operation activities to areas disturbed during construction Complete tree clearing in the winter in accordance with the Migratory Birds Convention Act (specifically outside of critical nesting and rearing periods of April 14 to August 28) Maintain 100 m buffer zone around lakes and sub-area boundaries Re-vegetate disturbed or reclaimed areas	Perform periodic inspections during construction and operation for signs of potential effects Maintain buffer zones Maintain re-vegetated areas Ensure adherence to environmental guidelines and protocols	1	2	2	3	2	1	1	N

Table 14 Cont'd

Environmental Effect	Adversity (Table 11)	Mitigation Measures	Follow-up	Significance (S)* (see Table 12)							
				a	b	c	d	e	f	g	S
		during and after operation									
Disturbance of migratory and other bird nesting during construction activities from equipment noise and vibration	Minor	Locate peat harvesting components away from critical migratory bird habitat Schedule construction activities outside of critical nesting and rearing periods Maintain buffer zones around lakes and sub-area boundaries	Adhere to licence terms and conditions	1	2	2	2	2	1	2	N
Aquatic Biota / Habitat											
Disturbance to aquatic biota and habitat due to elevated levels of suspended sediment in peatland drainage water	Minor	Minimize disturbance around lakes by maintaining buffer zones Install gated culvert to control water discharge if needed to manage suspended sediment	Perform periodic inspections of outlet ditch for debris Clean drainage ditches on a regular basis Monitor water discharge on a regular basis	3	2	2	3	2	1	1	N
Disturbance of habitat due to construction activities involved in installation of culvert crossings	Minor	Follow the Manitoba Stream Crossing Guidelines for the protection of Fish and Fish Habitat Follow best management practices (re: timing window, sediment/erosion control, revegetation, etc.)	None proposed	3	2	1	1	1	2	1	N
Amphibians and Reptiles / Habitat											
Loss and disturbance to amphibians and reptiles and their habitat	Minor	Minimize the area of disturbance by limiting construction to designated areas Limit operation activities to areas disturbed during construction Minimize disturbance of vegetation around ponds by maintaining buffer zones	None proposed	1	2	2	2	2	1	2	N
Economic Conditions											
Creation of employment and	Positive	None proposed	None proposed	3	1	2	3	3	1	2	N

Table 14 Cont'd

Environmental Effect	Adversity (Table 11)	Mitigation Measures	Follow-up	Significance (S)* (see Table 12)							
				a	b	c	d	e	f	g	S
introduction of money to the regional economy											
Business Opportunities											
Creation of jobs and contracts for construction and operation requirements	Positive	None proposed	None proposed	3	1	2	2	3	1	2	N
Traffic											
Traffic may cause dust, road kills, and result in increased road maintenance	Moderate	Utilize dust control methods on the access road Reduce speed and follow posted limits Reduce the number of vehicles traveling during high wind events Only travel during daylight hours Provide wildlife information to drivers	Monitor the number of vehicles traveling associated with peat harvesting operation Record public complaints and vehicle accidents Consider further action as warranted	2	1	2	3	3	2	1	N
Noise and Vibration											
Increased noise and vibration in the regional area and on highways	Minor	Muffle vehicles and equipment Limit unnecessary long-term idling Require a high standard of maintenance for heavy equipment	Monitoring and periodically tracking noise levels and public complaints	2	1	2	3	2	2	1	N
Human Health											
Risk of adverse effects on public attitude and general health and well-being due noise, vibrations and dust generated	Moderate	Utilize dust control methods Reduce number of vehicles travelling during high wind events Drive according to road conditions Adhere to posted speed limits Operate transport trucks only during daylight hours	Monitor dust levels Track public complaints Consider further action as warranted	3	1	2	3	2	2	1	N

Table 14 Cont'd

Environmental Effect	Adversity (Table 11)	Mitigation Measures	Follow-up	Significance (S)* (see Table 12)							
				a	b	c	d	e	f	g	S
Risk of effects to worker health associated with poor air quality from VOCs, carbon monoxide, propane gas and dust	Minor	Ensure a high standard of equipment maintenance	Conduct regular maintenance of equipment	3	1	2	2	2	2	1	N
Potential threat to public and worker safety during construction and operation activities	Public - Negligible and Worker - Minor	Locked gate signed with no trespassing Compliance with Manitoba Workplace Safety and Health regulations Develop and enforce standard operation procedure guidelines Provide training to employees Ensure visitors have reported in and are accompanied by an employee	Record occurrence of workplace accidents/incidents Update employee training and safety guidelines as required	3	1	2	3	2	2	1	N
Aesthetic Values											
Impaired aesthetic dust during peat harvesting from transport trucks and dust	Minor	Utilize dust control methods and cover loads during transport to and from the site Re-vegetate the peat fields in accordance with the Peatland Recovery Plan	Observe dust and debris levels Record public complaints	2	1	2	3	2	2	1	N
Aboriginal and Treaty Rights											
Reduced access to lands for practicing traditional harvesting activities such as hunting, trapping and gathering of plants	Minor	Minimize area cleared Re-store site to pre-harvest conditions (peat-accumulating bog) once harvesting is complete Maintain buffer zones around lakes and sub-area boundary Additional mitigation measures will be considered, if warranted, and based on ongoing communication with First Nation and Metis groups that may use the area for	Adhere to licence terms and conditions	3	1	2	3	2	2	2	N

Table 14 Cont'd

Environmental Effect	Adversity (Table 11)	Mitigation Measures	Follow-up	Significance (S)* (see Table 12)							
				a	b	c	d	e	f	g	S
		Aboriginal and Treaty rights									
Reduction of traditional resources available for hunting, trapping and other traditional harvesting practices	Minor	<u>Follow mitigation measures identified for vegetation, mammals, birds, such as:</u> Minimize loss and disturbance of vegetation Protect vegetation along the perimeter of the cleared areas from blow-down Limit construction activities to designated areas Maintain habitat around the sub-area Maintain 100 m buffer zone around lakes and sub-area boundaries Re-vegetate harvest area to natural conditions Maintain ongoing communications with First Nation groups and the MMF with respect to use of the area for Aboriginal and Treaty rights	Ensure adherence to environmental guidelines and protocols Adhere to licence terms and conditions Maintain buffer zones	3	1	2	3	2	1	2	N
Recreation / Tourism											
Truck traffic and resulting dust could cause decline in tourism to nearby recreational areas	Minor	Utilize dust control methods Cover loads during transport to and from the site Reduce number of vehicles travelling during high wind events Drive according to road conditions Adhere to posted speed limits Operate transport trucks only during daylight hours	Track public complaints	2	1	2	2	3	2	1	N
Areas of Interest											
Disturbance and alteration to	Minor	Limit construction activities to designated	Periodically inspect the site during	3	1	2	3	2	2	2	N

Table 14 Cont'd

Environmental Effect	Adversity (Table 11)	Mitigation Measures	Follow-up	Significance (S)* (see Table 12)							
				a	b	c	d	e	f	g	S
the Agassiz Provincial Forest, and hunting and trapping activity		areas Protect adjacent trees from blow-down Re-use timber from clearing	construction for signs of potential disturbances Ensure construction crews adhere to designated areas								

* S = significance

Y = significant - rated a "3" for at least four criteria, at least one of which must be criteria a or b; or rated "2" or "3" for all criteria

N = not significant

TABLE 15
MITIGATION MEASURES SUMMARY FOR THE PROPOSED PEAT DEVELOPMENT

Mitigation Measures	Design	Proposed	Regulatory	Management
Microclimate				
Install snow fences to control snow deposition on the property if required		●		
Air Quality				
Cover loads being hauled		●		
Use an approved dust suppressant and control vehicle speed		●		●
Limit peat handling activities during high wind events				●
Orient peat harvesting and stockpiles with prevailing winds	●	●		
Re-establish vegetation on disturbed areas		●		
Instruct employees on proper equipment operation to minimize dust				●
Require a high standard of maintenance for construction equipment and vehicles, use low sulphur-containing fuels and limit unnecessary idling				●
Use appropriate fuel dispensing equipment			●	●
Utilize windbreaks (tree and brush barriers)	●	●		
Implement the Peatland Recovery Plan that addresses greenhouse gas emissions		●		●
Minimize the area cleared	●			
Soils				
Minimize the surface area disturbed	●			
Leave non-commercial peat reserves in place	●			●
Implement the Peatland Recovery Plan to restore the area to natural conditions			●	●
Prevent leaks, spills and releases	●			
Provide drip trays for equipment and spill clean-up equipment and materials	●			●
Prepare an emergency (spill) response plan		●		●
Comply with provincial fuel storage and dispensing regulations and storing hazardous materials in approved containers (secondary containment)			●	●
Ensure equipment arrives to site in good condition				●
Designate refueling areas	●			●
Groundwater				
Prevent leaks, spills and releases	●			
Provide drip trays for equipment and spill clean-up equipment and materials	●			●
Preparing an emergency (spill) response plan		●		●
Comply with provincial fuel storage and dispensing regulations and storing hazardous materials in approved containers (secondary containment)			●	

Mitigation Measures	Design	Proposed	Regulatory	Management
Surface Water				
Limit surface area disturbance	●			
Maintain water levels on undisturbed areas		●		●
Implement the Peatland Recovery Plan to restore pre-harvesting water levels			●	●
Install gated culvert to control water discharge if needed to manage suspended sediment	●			
Prevent leaks, spills and releases and provide fuel storage secondary containment	●			●
Provide drip trays for equipment and spill clean-up equipment and materials	●			●
Prepare an emergency (spill) response plan		●		●
Comply with provincial fuel storage and dispensing regulations and storing hazardous materials in approved containers (secondary containment)			●	●
If necessary, install a limestone or carbonate-lined drainage ditch to increase pH of draining bog water			●	●
Vegetation				
Restrict activities to designated areas	●			
Minimize vegetation loss or disturbance		●		
Protect vegetation along perimeter from blow-down		●		
Utilizing timber removed from site		●		●
Re-vegetate disturbed and reclaimed areas during and after operation	●			
Use an approved dust suppressant and limit construction activity during high wind events	●	●		●
Provide on-site fire suppression equipment		●		●
Prepare an emergency fire response plan		●		●
Notify Manitoba Conservation and Climate immediately in event of a fire or explosion				●
Mammals / Habitat				
Minimize habitat (vegetation) loss or disturbance		●		
Limit construction to designated areas and operation activities to areas disturbed during construction	●			
Maintain habitat around the sub-area		●		
Provide wildlife awareness information to drivers	●			●
Implement the Peatland Recovery Plan to revegetate disturbed areas after harvesting is complete	●		●	●
Transport peat during daylight hours, post signs to warn and educate drivers to avoid wildlife on the highway and adhere to posted speed limits				●
Regular disposal of waste at existing waste facilities		●		
Animal deterrents such as noise makers, reflectors and scents if required		●		
Birds / Habitat				
Minimize habitat (vegetation) loss or disturbance		●		

Mitigation Measures	Design	Proposed	Regulatory	Management
Complete tree clearing in the winter in accordance with the Migratory Birds Convention Act (specifically outside of critical nesting and rearing periods of April 14 to August 28)	●		●	●
Limit construction to designated areas and operation activities to areas disturbed during construction	●			
Minimize disturbance around ponds by retaining buffer zones	●			
Maintain habitat buffer zones around sub-area boundary		●		
Implement a restoration plan to revegetate disturbed and reclaimed areas after harvesting is complete	●		●	●
Aquatic Biota / Habitat				
Minimize disturbance around lakes by maintaining buffer zones	●			
Install gated culvert to control water discharge if needed to manage suspended sediment	●			
Follow the Manitoba Stream Crossing Guidelines for the protection of Fish and Fish Habitat	●		●	
When installing culvert, follow best management practices (regarding timing window, sediment/erosion control, revegetation of disturbed soils	●			
Amphibians and Reptiles / Habitat				
Minimize the area of disturbance by limiting construction to designated areas		●		
Limit operation activities to areas disturbed during construction	●			
Minimize disturbance of vegetation around lakes by maintaining buffer zones	●			
Economic Conditions				
No mitigation proposed				
Business Opportunities				
No mitigation proposed				
Traffic				
Reduce wildlife interactions by traveling only during daylight hours and providing wildlife information to drivers		●		●
Road dust control by approved dust suppressant, reducing speed, following posted limits and reducing the number of vehicles during wind events		●		●
Noise and Vibration				
Require a high standard of maintenance for construction equipment and vehicles, muffle vehicles and equipment and limit unnecessary idling				●
Human Health				
Limit dust generation by using water, reducing number of vehicles travelling during high winds, adhering to posted speed limits and driving according to road conditions		●	●	●
Require a high standard equipment maintenance	●			●
Locked gate with no trespassing signs on access road	●			
Comply with Manitoba Workplace Safety and Health regulations			●	●

Mitigation Measures	Design	Proposed	Regulatory	Management
Provide employee training and develop and enforce standard operation procedure guidelines			●	●
Ensure all visitors have reported in and are accompanied by an employee				●
Aesthetic Values				
Utilize dust control methods and cover loads during transport to and from the site		●		
Re-vegetate the harvest areas in accordance with the Peatland Recovery Plan	●			
Aboriginal and Treaty Rights				
Minimize area cleared, minimize disturbance, maintain buffer around lakes and sub-area boundary, protect vegetation along the perimter of the cleared area from blow-down	●	●	●	
Restore site to pre-harvest conditions (peat-accumulating bog) once harvesting is complete		●	●	
Limit construction activities to designated areas		●		
Additional mitigation measures will be considered, if warranted, and based on ongoing communication with First Nation and Metis groups that may use the area for Aboriginal and Treaty rights		●		●
Recreation/Tourism				
Limit dust generation by using water, reducing number of vehicles travelling during high winds, adhering to posted speed limits and driving according to road conditions		●	●	●
Areas of Interest				
Limit construction activities to designated areas, protect adjacent trees from blow-down and re-use timber from clearing	●	●		
Heritage Resources				
If heritage resources are encountered, cease construction and notify Historic Resources Branch with additional construction occurring as directed by the Historic Resources Branch			●	●

TABLE 16
FOLLOW-UP SUMMARY FOR THE PROPOSED PEAT DEVELOPMENT

Follow-up	Inspecting	Monitoring	Record Keeping	Reporting
Microclimate				
Inspect airflow and snow deposition patterns	●			
Air Quality				
Observe fugitive dust levels during construction and accumulated dust during operation	●			
Perform periodic inspections of adjacent properties and access roads for dust and debris	●			
Track complaints from local residents			●	
Perform periodic inspections of air quality during construction	●			
Record maintenance of equipment			●	
Require submission of Safety Data Sheets for all products used			●	
Adhere to licence terms and conditions	●			
Soils				
Conduct annual monitoring and report on implementation of the progressive restoration activities		●	●	●
Perform periodic inspections for leaks, spills and releases	●			
Ensure construction and operation crews adhere to designated areas	●			
Remediate and record fuel spills and releases	●		●	●
Update the emergency response plan periodically			●	
Adhere to licence terms and conditions	●			
Groundwater				
Perform periodic inspections for leaks, spills and releases	●			
Remediate and record fuel spills and releases	●		●	●
Update the emergency (spill) response plan periodically			●	
Adhere to licence terms and conditions	●			
Surface Water				
Perform periodic inspections of surface water bodies	●			
Report on implementation of the progressive restoration activities annually	●		●	●
Monitor surface water runoff flows from the harvest area		●	●	
Perform periodic inspections for evidence of erosion	●			
During operation collect surface water samples from each outlet monthly for analysis of suspended sediment		●	●	
Conduct additional water monitoring as developed with Manitoba Conservation and Climate		●	●	●
Clean drainage ditches on a regular basis	●			

Follow-up	Inspecting	Monitoring	Record Keeping	Reporting
Perform periodic inspections for leaks, spills and releases	●			
Remediate and record fuel spills and releases	●		●	●
Update the emergency (spill) response plan periodically			●	
Adhere to licence terms and conditions	●			
Vegetation				
Perform periodic inspections for vegetation stress and mortality around cleared area and invasion of nuisance or weed species	●			
Observe accumulated dust on plants during operation	●			
Conduct periodic assessments of fire risk and updates to emergency (fire) response plan			●	
Examine fire fighting equipment regularly	●		●	
Conduct employee training in the use of this equipment regularly			●	
Mammals / Habitat				
Perform periodic inspections of habitat during construction and operation	●			
Maintain re-vegetated areas and buffer zones	●			
Ensure adherence to environmental guidelines and protocols	●			
Maintain records of vehicle-wildlife interactions			●	
Maintain records of problem or nuisance wildlife situations			●	
Adhere to licence terms and conditions	●			
Birds / Habitat				
Perform periodic inspections of habitat during construction and operation	●			
Maintain re-vegetated areas and buffer zones	●			
Ensure adherence to environmental guidelines and protocols	●			
Adhere to licence terms and conditions	●			
Aquatic Biota / Habitat				
Perform periodic inspections of outlet ditch for debris	●			
Clean drainage ditches regularly	●			
Monitor water discharge on a regular basis		●	●	●
Amphibians and Reptiles / Habitat				
No follow-up proposed				
Economic Conditions				
No follow-up proposed				
Business Opportunities				
No follow-up proposed				
Traffic				

Follow-up	Inspecting	Monitoring	Record Keeping	Reporting
Monitor the number of vehicles travelling associated with the peat harvesting	●		●	
Record public complaints and vehicle accidents			●	
Monitor situation and take further action as warranted	●			
Noise and Vibration				
Observe and periodically track noise levels and public complaints	●		●	
Human Health				
Observe dust levels	●			
Track health complaints from local residents			●	
Monitor situation and take further action as warranted	●			
Conduct regular maintenance of equipment	●		●	
Record workplace accidents			●	
Update employee training and safety guidelines as required			●	
Aesthetic Values				
Inspect dust and debris levels	●			
Track public complaints			●	
Aboriginal and Treaty Rights				
Ensure adherence to environmental guidelines and protocols	●			
Maintain re-vegetated areas and buffer zones	●			
Adhere to licence terms and conditions	●			
Recreation/Tourism				
Track public complaints			●	
Areas of Interest				
Inspect site during construction for signs of potential disturbances	●			
Ensure crews adhere to designated construction areas	●			
Recreation/Tourism				
No follow-up proposed				

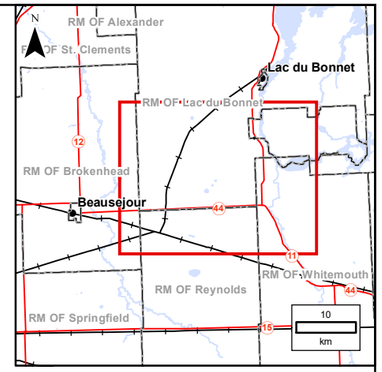
FIGURES

690000 700000 710000

5560000 5550000

N W E S

Allegra
Mooswa Lake
BROKENHEAD OJIBWAY NATION COMMUNITY INTEREST ZONE
Milner Ridge
AGASSIZ PROVINCIAL FOREST
RM OF LAC DU BONNET
MILNER RIDGE NORTH AREA OF SPECIAL INTEREST
MILNER RIDGE WEST AREA OF SPECIAL INTEREST
RM OF BROKENHEAD
SEDDONS CORNER AREA OF SPECIAL INTEREST
EVERGREEN 1
MILNER RIDGE EAST AREA OF SPECIAL INTEREST
EVERGREEN 2 & 3
Seddons Corner
Golden Bay
44
NORTH JULIUS
RM OF REYNOLDS
Molson
MOSS SPUR 1
AECL ADDITION AREA OF SPECIAL INTEREST
LEE RIVER WILDLIFE MANAGEMENT AREA
Winnipeg River
AECL AREA OF SPECIAL INTEREST
LGD OF PINAWA
WHITESHELL PROVINCIAL PARK
PINAWA PROVINCIAL PARK
WHITEMOUTH FALLS PROVINCIAL PARK
Brookfield
RM OF LAC DU BONNET
Natalie Lake
WHITEMOUTH FALLS PROVINCIAL PARK
Seven Sisters Falls
11
River Hills
Siegs Corner
RM OF WHITEMOUTH
WHITEMOUTH BOG AREA OF SPECIAL INTEREST
Oldenberg



LEGEND:

- Regional Study Area
- Project Study Area
- Evergreen 1 Sub-area Boundary
- Major Road
- Road
- Street
- Railway
- River
- Ditch
- Lake
- Area of Special Interest
- Brokenhead Ojibway Nation Community Interest Zone
- Provincial Park
- Wildlife Management Area
- Provincial Forest

NOTES:
1. Image Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.
2. All units are metric and in metres unless otherwise specified. Transverse Mercator Projection, NAD 1983, Zone 14. Elevations are in metres above sea level (MSL).

1 0 1 2 3 4
Kilometres

SCALE: 1:100,000 METRIC 11"x17"

NO.	YY/MM/DD	DESCRIPTION	ISSUED BY	CHECK BY
0	20/10/13	ISSUED WITH FINAL REPORT	DL	SFM

REVISIONS / ISSUE

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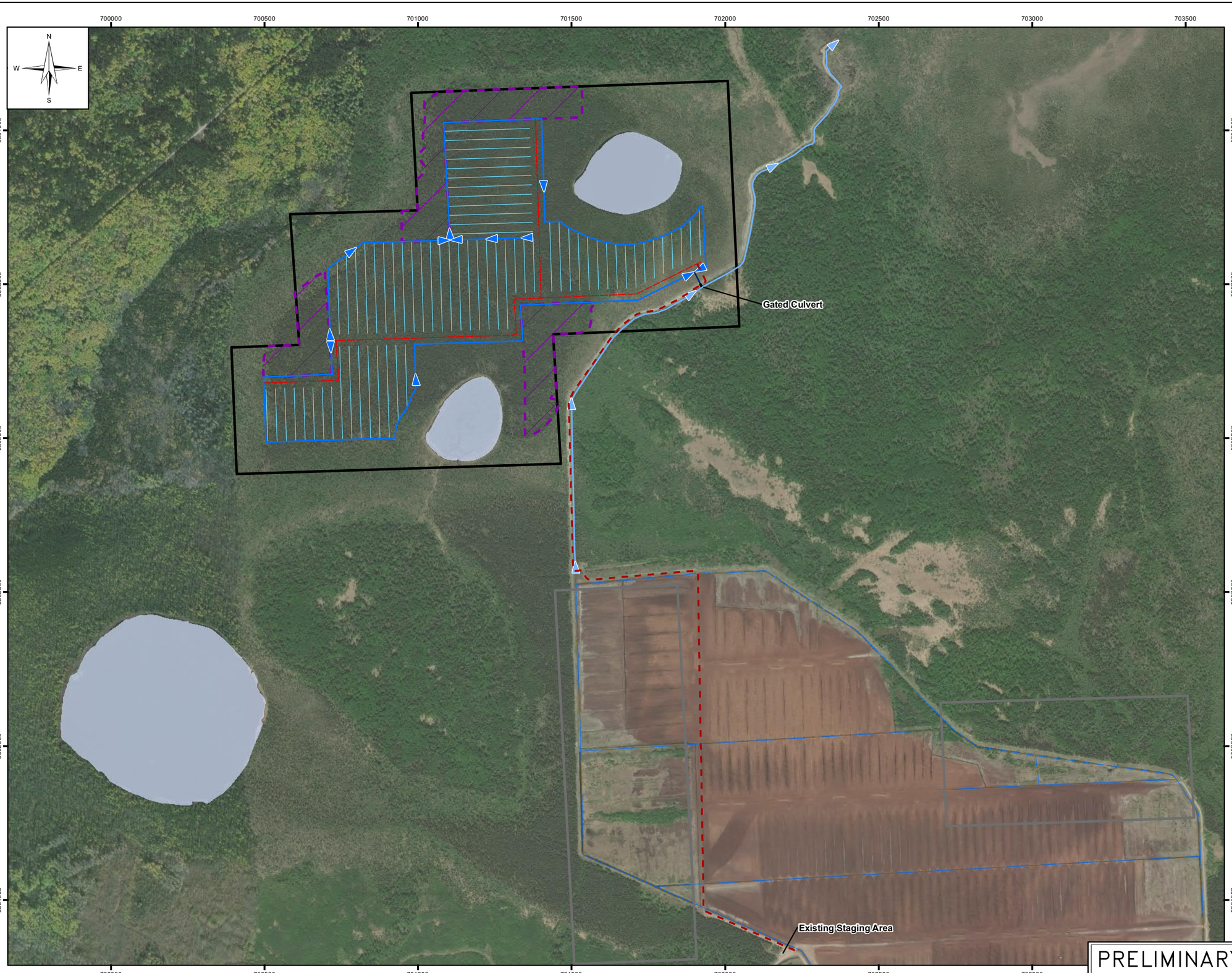
EVERGREEN 1 BOG – ENVIRONMENT ACT LICENCE

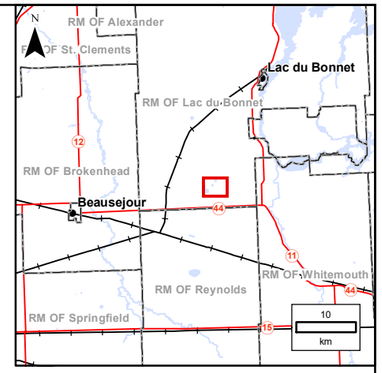
REGIONAL SITE LOCATION

OCTOBER 2020 | FIGURE 01 | REV: 0

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

FileName: P:\Projects\2020\20-0293-003\Dwg\GIS\MXD\EAP\20-0293-003_Fig01.mxd
11"x17" PLOT SCALE 1:1





LEGEND:

- Field Drain
- Outlet Drain
- Existing Drain
- Main Drainage Ditch/Flow Direction
- Gated Culvert
- Access Road
- Bog Road
- Donor Area
- Regional Study Area
- Project Study Area
- Other PHL
- Evergreen 1 Sub-area Boundary
- Ditch
- Lake

NOTES:
1. Image Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.
2. All units are metric and in metres unless otherwise specified. Transverse Mercator Projection, NAD 1983, Zone 14. Elevations are in metres above sea level (MSL).

200 0 200 400
Meters

SCALE: 1:12,000 METRIC 11"x17"

NO.	YY/MM/DD	DESCRIPTION	ISSUED BY	CHECK BY
0	20/10/13	ISSUED WITH FINAL REPORT	DL	SFM

REVISIONS / ISSUE

KGS GROUP

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EVERGREEN 1 BOG –
ENVIRONMENT ACT LICENCE

GENERAL SITE LAYOUT

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

OCTOBER 2020 | FIGURE 02 | REV: 0

FileName: P:\Projects\2020\20-0293-003\Dwg\GIS\MXD\EAP\20-0293-003_Fig02.mxd
11"x17" PLOT SCALE 1:1

690000 695000 700000 705000 710000

5560000 5555000 5550000 5545000

N W E S

RM OF LAC DU BONNET

RM OF REYNOLDS

RM OF WHITEMOUTH

LGD OF PINAWA

Winnipeg River

To Bachman East Drain

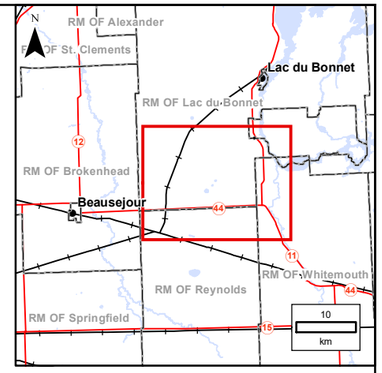
SB1

SB2

EVERGREEN 1

11 44

235 240 245 250 255 260 265 270 275 280 285 290 295 300 305



LEGEND:

- Evergreen 1 Sub-area Boundary
- Major Road
- Road
- Street
- Railway
- 5m Indec CDEM Contour
- 1m CDEM Contour
- River
- Ditch
- Lake
- RM Boundary
- Watershed Sub-Basin
- Drainage Direction

NOTES:
1. Image Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.
2. All units are metric and in metres unless otherwise specified. Transverse Mercator Projection, NAD 1983, Zone 14. Elevations are in metres above sea level (MSL).

1 0 1 2 3
Kilometres

SCALE: 1:75,000 METRIC 11"x17"

NO.	YY/MM/DD	DESCRIPTION	ISSUED BY	CHECK BY
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REVISIONS / ISSUE

KGS GROUP

sungro HORTICULTURE

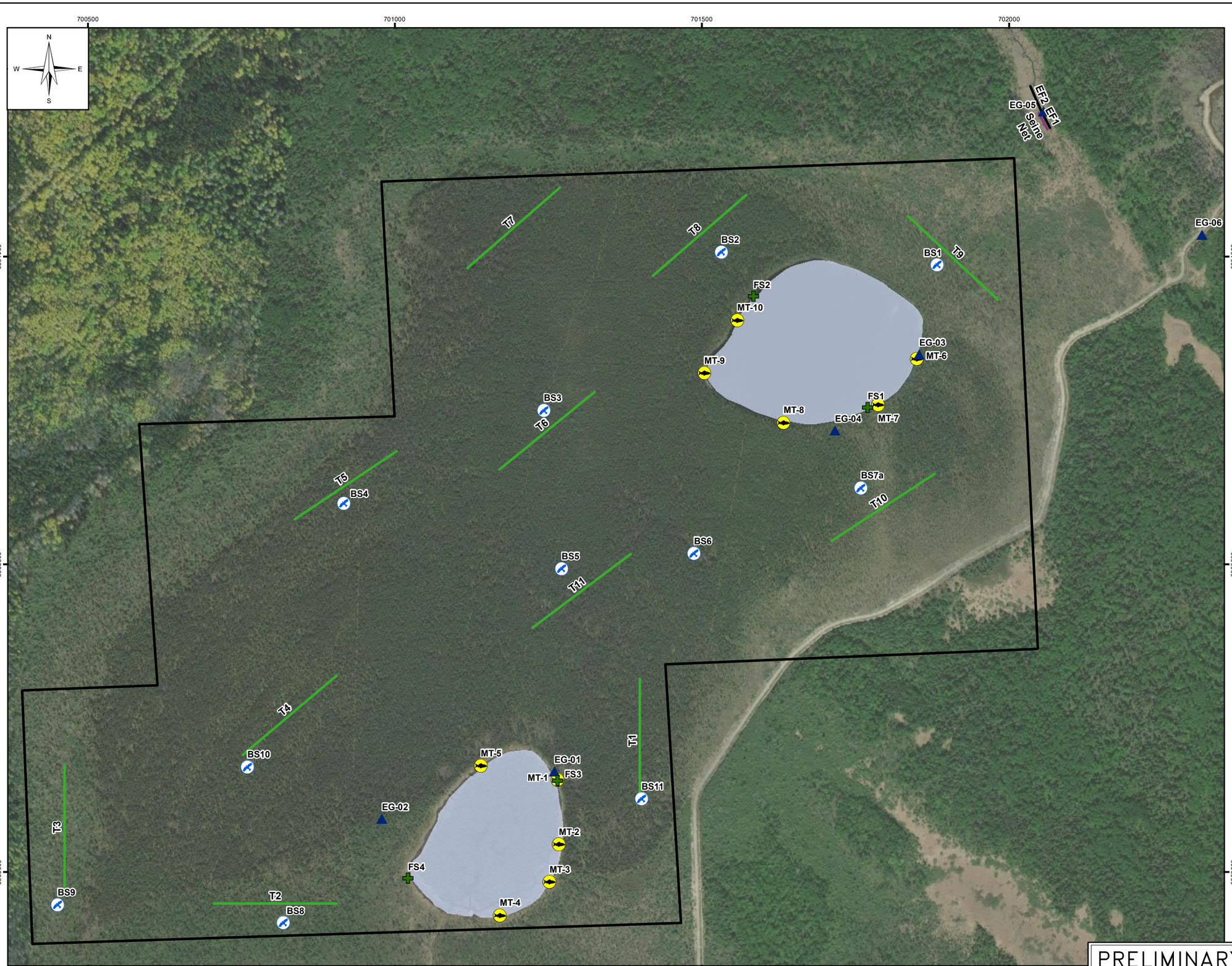
EVERGREEN 1 BOG –
ENVIRONMENT ACT LICENCE

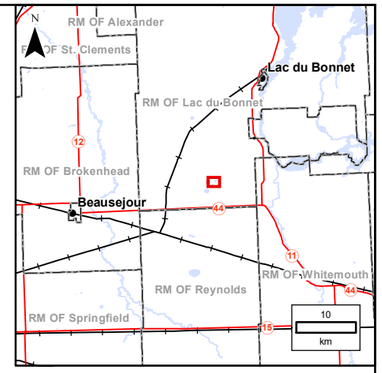
SITE DRAINAGE AND
SURFACE WATER FLOW PATTERN

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

OCTOBER 2020 | FIGURE 03 | REV: 0

FileName: P:\Projects\2020\20-0293-003\Dwg\GIS\MXD\EAP\20-0293-003_Fig03.mxd
11"x17" PLOT SCALE 1:1





LEGEND:

- Bird Station
- Frog Station
- Minnow traps
- Water quality stations
- Electrofishing Transects
- Seine Net Transects
- Vegetation Transect
- Evergreen 1 Sub-area Boundary
- Lake

NOTES:
1. Image Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.
2. All units are metric and in metres unless otherwise specified. Transverse Mercator Projection, NAD 1983, Zone 14. Elevations are in metres above sea level (MSL).

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Kilometres

SCALE: 1:6,000 METRIC 11"x17"

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REVISIONS / ISSUE

KGS GROUP

sungro HORTICULTURE

EVERGREEN 1 BOG –
ENVIRONMENT ACT LICENCE

BASELINE SAMPLING PROGRAM

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

OCTOBER 2020 | FIGURE 04 | REV: 0

FileName: P:\Projects\2020\20-0293-003\Dwg\GIS\MXD\EAP\20-0293-003_Fig04.mxd
11"x17" PLOT SCALE 1:1

APPENDIX A

Environment Act Licence 305R

Manitoba
Sustainable Development

Environmental Stewardship Division
Environmental Approvals Branch
123 Main Street, Suite 160, Winnipeg, Manitoba R3C 1A5
T 204 945-8321 F 204 945-5229
www.gov.mb.ca/sd/eal

CLIENT FILE NO.: 628.00

February 5, 2018

Connie Proceviat, General Manager
Sun Gro Horticulture Canada Ltd.
#52080 Peat Moss Road
Elma MB R0E 0Z0

Dear Ms. Proceviat:

Enclosed is revised **Environment Act Licence No. 305 R** issued to **Sun Gro Horticulture Canada Ltd.** for the continued operation of the Development being a peat harvesting operation at the Evergreen Bog in accordance with the Application filed and considered by the Clean Environment Commission.

Please also note that licence terms and conditions have been updated, where appropriate, to reflect new standard wording and revised to reflect the new regulatory regime pursuant to the Peatlands Stewardship Act.
If you have any questions, please contact Darrell Ouimet at Darrell.Ouimet@gov.mb.ca. For operational issues contact Regional Supervisor Diane Oertel at 204-345-1486.

Pursuant to Section 27 of The Environment Act, this licensing decision may be appealed by any person who is affected by the issuance of this Licence to the Minister of Sustainable Development within 30 days of the date of the Licence.

Yours truly,

Tracey Braun

Tracey Braun, M.Sc.
Director
Environmental Approvals Branch

c: Don Labossiere/Diane Oertel - Environmental Compliance and Enforcement
Public Registries

NOTE: **Confirmation of Receipt of this Licence No. 305 R *(by the Licencee only)* is required by the Director of Environmental Approvals. Please acknowledge receipt by signing in the space below and provide a copy (letter only) to the Department by February 19, 2018.**

On behalf of Sun Gro Horticulture Canada Ltd. **Date**

****A COPY OF THE LICENCE MUST BE KEPT ON SITE AT THE DEVELOPMENT AT ALL TIMES****

THE ENVIRONMENT ACT
LOI SUR L'ENVIRONNEMENT

Manitoba

LICENCE

Licence No. / Licence n° 305 R

Issue Date / Date de délivrance September 7, 1973

Revised : February 5, 2018

In accordance with The Environment Act (C.C.S.M. c. E125) / Conformément à la Loi sur l'environnement (C.P.L.M. c. E125)

Pursuant to Section 11(1) and 14(2) / Conformément au Paragraphe 11(1) et 14(2)

THIS LICENCE IS ISSUED TO : / CETTE LICENCE EST DONNÉE À :

SUN GRO HORTICULTURE CANADA LTD.;
"the Licencee"

for the construction, operation and recovery of the Development being a peat harvesting operation located in the Evergreen Bog in the Rural Municipality of Lac du Bonnet including:

- Sub Area Evergreen 2 and Sub Area Evergreen 3 of Peat Harvest Licence no. 3 issued to Sun Gro Horticulture Canada Ltd., pursuant to the The Peatlands Stewardship Act; and
- All parts of Sections 3, 4, 5, 9 and 10, Township 13, Range 10 EPM;

in accordance with the Application considered by the Clean Environment Commission on August 13, 1973 and subject to the following specifications, limits, terms and conditions:

DEFINITIONS

In this Licence,

"accredited laboratory" means an analytical facility accredited by the Standard Council of Canada (SCC), or accredited by another accrediting agency recognized by Sustainable Development to be equivalent to the SCC, or able to demonstrate, upon request, that it has the quality assurance/quality control (QA/QC) procedures in place equivalent to accreditation based on the international standard ISO/IEC 17025, or otherwise approved by the Director;

"active harvesting area" means any prepared field within the Development, which has undergone preliminary induced drainage for access, and on which surface disturbance in preparation for peat harvesting has commenced, until such time as when the harvested field has been isolated for recovery;

"approved" means approved in writing;

"buffer zone" means a strip of undisturbed land comprised of in-situ vegetation;

"dangerous goods" means dangerous goods as defined in The Dangerous Goods Handling and Transportation Act, and regulations issued thereunder;

"Director" means an employee so designated pursuant to The Environment Act;

"drainage water" means surface or sub-surface water induced, by reason of constructed drains, to drain towards a final discharge point of the Development, but does not include surface runoff diverted around an active harvesting area nor preliminary induced drainage;

"effluent" means drainage water or wastewater released into the environment;

"Environment Officer" means an employee so designated pursuant to The Environment Act;

"final discharge point" means an effluent quality control point as designated within this Licence, unless otherwise re-designated in writing by the Director;

"fugitive emissions" means suspended particulate matter windblown into the atmosphere and off-site from any source on-site of the Development;

"Integrated Resource Management Team (IRMT)" means a regional management team made up of members of Sustainable Development organized to review natural resource issues;

"noise nuisance" means an unwanted sound, in an affected area, which is annoying, troublesome, or disagreeable to a person:

a) residing in an affected area;
b) working in an affected area; or
c) present at a location in an affected area which is normally open to members of the public;

if the unwanted sound

a) is the subject of at least 5 written complaints, received by the Director in a form satisfactory to the Director and within a 90 day period, from 5 different persons falling within clauses (a), (b) or (c), who do not live in the same household; or
b) is the subject of at least one written complaint, received by the Director in a form satisfactory to the Director, from a person falling within clauses (a), (b) or (c) and the Director is of the opinion that if the unwanted sound had occurred in a more densely populated area there would have been at least 5 written complaints received within a 90 day period from 5 different persons and who do not live in the same household;

"particulate matter" means any finely divided liquid or solid matter other than water droplets;

"peat" means peat as defined in The Peatlands Stewardship Act, or any future amendment there of;

"peat harvesting" means peat harvesting as defined in The Peatlands Stewardship Act, or any future amendment there of;

"peat harvest licence" means a peat harvesting licence as defined in The Peatlands Stewardship Act, or any future amendment there of.

peatland management plan" means a peatland management plan as defined in The Peatlands Stewardship Act, or any future amendment there of.

"peatland recovery plan" means a peatland recovery plan as defined in The Peatlands Stewardship Act, or any future amendment there of.

"preliminary induced drainage" means induced surface and subsurface drainage, off an area intended to be harvested, to the extent as may be required to facilitate access to, and the construction of, sedimentation ponds incorporating final discharge points;

"recovery" means land recovery as defined in The Peatlands Stewardship Act and associated Peatland Recovery Plan Guidelines, or any future amendment there of;

"riparian area" means an area of land on the banks or in the vicinity of a waterbody, which due to the presence of water supports, or in the absence of human intervention would naturally support, an ecosystem that is distinctly different from that of adjacent upland areas (The Water Protection Act 2005);

"septage" means the sludge produced in individual on-site sewage disposal systems such as septic tanks;

"sewage" means sewage as defined in Manitoba Regulation 83/2003, or any future amendment thereto, respecting private sewage disposal systems and privies;
"Standard Methods for the Examination of Water and Wastewater" means the most recent edition of Standard Methods for the Examination of Water and Wastewater published jointly by the American Public Health Association, the American Waterworks Association and the Water Environment Federation; and

"waterbody" means any body of flowing or standing water, whether naturally or artificially created, and whether the flow or presence of water is continuous, intermittent or occurs only during a flood, including but not limited to a lake, river, creek, stream, and wetland (slough, marsh, swamp, etc.), including ice on any of them (The Water Protection Act 2005).

"wastewater" means any liquid containing a pollutant (as defined in The Environment Act) which is designated for release into the environment.

GENERAL TERMS AND CONDITIONS

This Section of the Licence contains requirements intended to provide guidance to the Licencee in implementing practices to ensure that the environment is maintained in such a manner as to sustain a high quality of life, including social and economic development, recreation and leisure for present and future Manitobans.

Additional Reporting

1. The Licencee shall, in addition to any of the specifications, limits, terms and conditions specified in this Licence, upon the request of the Director:
   a) sample, monitor, analyse or investigate specific areas of concern regarding any segment, component or aspect of the Development for such duration and at such frequencies as may be specified;
   b) determine the environmental impact associated from the Development;
   c) conduct specific investigations in response to the data gathered during environmental monitoring programs; or
   d) provide the Director, within such time as may be specified, with such reports, drawings, specifications, analytical data, descriptions of sampling and other information as may from time to time be requested.

Sampling and Analysis

2. The Licencee shall, unless otherwise specified in this Licence:
   a) carry out all preservations and analyses of liquid samples in accordance with the methods prescribed in the Standard Methods for the Examination of Water and Wastewater or in accordance with equivalent preservation and analytical methodologies approved by the Director; and
   b) ensure that all analytical determinations are undertaken by an accredited laboratory.

Reporting Format

3. The Licencee shall provide to the Director or Environment officer, upon request, all information required under this Licence, in an acceptable electronic format, or in writing as requested, and in such form and content (including number of copies), as may be specified by the Director or Environment Officer. Each submission shall be clearly labelled with the Licence Number and Client File Number associated with this Licence.

SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

Emergency Response Plan

4. The Licencee shall prepare, within 90 days of the date of issuance of this Licence, and maintain an emergency response contingency plan in accordance with the Canadian Centre

for Occupational Health and Safety "Emergency Response Planning Guide" or other emergency planning guidelines acceptable to the Director.

Pre-Construction Surveys

5. The Licencee shall, before commencing any surface disturbance or preliminary induced drainage of an intended harvesting area within the Development:
   a) conduct a survey of the intended harvesting area with respect to rare or endangered species and species of special concern, as well as migratory birds, their nests and their eggs;
   b) submit a report on the survey for the approval of the Director;
   c) transplant any visible rare, endangered or threatened species of vegetation, including species of vegetation used for traditional medicines which may be encountered on the site, to another equally suitable site in consultation with the regional wildlife manager of Sustainable Development; and
   d) upon the completion of any transplantation activity, advise the Director, in writing, of the type and number of any plant species so transplanted and the location to which they were transplanted.

Project Land Use

6. The Licence shall restrict construction and operational activities related to the Development, except for the road allowance of all access roads, to those lands to which the Licencee possesses:
   a) a Peat Harvest Licence issued pursuant to The Peatlands Stewardship Act or any future amendment thereof, for peat harvesting operations on Crown Lands;
   b) surface rights, or complete ownership, or a signed agreement with another person or legal entity respecting the use of any land to which that person or legal entity possesses the surface rights or complete ownership, wherein the agreement clearly identifies the party which accepts full responsibility for any environmental liabilities incurred by the activities of the Licencee; and
   c) applicable work permits and timber cutting permits, as may be required by Sustainable Development.

7. The Licencee shall restrict all harvesting of peat associated with the Development to only those areas located within:
   a) the boundaries of Evergreen 2 and Evergreen 3 sub-areas of Peat Harvest Licence no. 3 and all privately owned land located in Sections 3, 4, 5, 9 and 10, Township 13, Range 10 EPM;
   b) the boundaries as described in any future newly acquired peat harvesting area of which the Director has been notified in writing, and has approved as an alteration to the licensed Development.

Harvesting Area

8. The Licencee shall not, unless otherwise approved by the Director, conduct any further expansion of peat harvesting activities on privately owned land located in Sections 3, 4, 5, 9 and 10, Township 13, Range 10 EPM;

Harvesting Plan

9. The Licencee shall, prior to commencing the surface disturbance of an undisturbed peat harvesting area that has been authorized to be prepared for harvesting, meet with and present to the IRMT the harvesting plan for the newly authorized area, outlining and detailing the following, and in accordance with the Licencee's Peatland Management Plan:
   a) the proposed drainage ditches;
   b) the proposed periphery and corridor buffer zones, where or if applicable;
   c) the depth of peat versus the proposed depth of harvesting; and
   d) the projected rates of water release, the projected effluent quality and the projected water quality impact downstream based on the compiled and reported sampling data collected pursuant to this Licence up to the time of the meeting;

   where upon any outstanding concerns brought to the attention of the Director by the IRMT may be addressed through work permits or other applicable approvals for the affected area.

Wildlife Habitat Losses

10. The Licencee shall, where any potential wildlife habitat losses have been identified by Sustainable Development, consult with the regional wildlife manager of Sustainable Development with respect to the mitigation of the losses, and carry out any related mitigation measures required by the Director.

Buffer Zones

11. The Licencee shall, unless otherwise approved by the Director, leave a buffer zone:
   a) of at least 150 metres from:
      i) the riparian areas of lakes, rivers, creeks, and streams; and
      ii) riparian beaver flood habitat;
   b) along such corridors within the Development, and to such a width as may be specified in writing by the Director in consideration of any recommendation(s) received from the IRMT respecting a desirability for any windbreak or habitat corridors.

Minimum Depth of Peat

12. The Licencee shall, until such time that a Peatland Recovery Plan is approved pursuant to Peat Harvest Licence no. 2 for sub areas Evergreen 2 and Evergreen 3, and a recovery plan is approved pursuant to Clause 42 of this licence for privately owned land in Sections 3, 4, 5, 9 and 10, Township 13, Range 10 EPM, maintain an average of at least 0.5 metre of in-situ peat throughout the bottom of any active harvesting area.

Clearing

13. The Licencee shall, where practical, avoid draining and clearing any portion of the overall Development too soon in advance of its needs.

Respecting Access Road Construction and Borrow Areas

14. The Licencee shall not create any new borrow pit(s) for the construction of the access/haulage road without prior consultation with, and the written concurrence of, the IRMT.

15. The Licencee shall not construct other roads connected to the Development. Short access routes for construction and maintenance purposes shall be approved in writing by the Integrated Resource Management Team of Sustainable Development prior to construction.

Water Rights Licence

16. The Licencee shall not construct any water control works associated with the Development, including engineered drains, nor release any drainage water from the Development, without the prior receipt of a Water Rights Licence to Construct Water Control Works from the Water Stewardship Division of Sustainable Development.

Drainage, Sedimentation Ponds and Effluent

17. The Licencee shall prevent, as much as practical, natural surface runoff water from outside the boundaries of the Development from entering the active harvesting areas of Development, by diverting such surface runoff water around the perimeter of the Development.

18. The Licencee shall, during construction and operation of the Development direct all drainage water associated with any harvesting area of the Development through one or more sedimentation ponds that are designed and constructed to achieve the effluent quality criteria specified in this Licence.

19. The Licencee shall release the effluent from each sedimentation pond through one or more final discharge points and shall register with the Director a list of all active final discharge points and their GPS locations, and maintain the registered list in a current status at all times.

20. The Licencee, unless otherwise approved by the Director, shall design and construct each sedimentation pond associated with the Development:
    a) to facilitate the termination, if necessary, of the release of any effluent from each final discharge point;
    b) with a manual flow rate measuring at each final discharge point that is adequate to measure the full range of instantaneous rates of discharge as may be expected to be released into the environment; and
    c) with a floating debris boom at the outlet of each final discharge point.

21. The Licencee shall not release any effluent from the Development where the release of the effluent would:
    a) cause a downstream flooding condition;
    b) contribute to a forecast downstream flooding condition; or
    c) further aggravate an existing flooding condition prevailing at that time.

22. The Licencee shall, if analysis of any grab sample taken of sampling locations EG-East or EG-West, indicate a pH of less than 5.0 pH units or the suspended solids concentration is greater than 30 milligrams per litre:
    a) immediately terminate effluent discharge from all final discharge points;
    b) notify the Environment Officer responsible for this licence; and
    c) undertake the appropriate corrective action or additional monitoring and analysis as prescribed by the Environment Officer responsible for this licence.

23. The Licencee shall, immediately upon identifying any non-compliance pursuant to Clauses 21 and 22, notify the Environment Officer responsible for this Licence.

Sewage Disposal

24. The Licencee shall dispose of all sewage and septage from on-site sanitary facilities in accordance with the Onsite Wastewater Management Systems Regulation 83/2003, or any future amendment thereof.

Stream Crossings

25. The Licencee shall adhere to the general recommendations on design, construction and maintenance of stream crossings as specified in the guidelines titled Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat, 1996.

Operation of Transport Trucks

26. The Licencee shall securely cover truck transport loads during transport to and from the development.

Air Emissions

27. The Licencee shall take all appropriate measures to limit wind entrainment of peat beyond the property boundary of the Development.

Solid Wastes

28. The Licencee shall dispose of solid waste at a waste disposal ground operating under the authority of a permit issued pursuant to the Waste Management Facilities Regulation 37/2016, or any future amendment thereof, or a licence issued pursuant to The Environment Act.

Storage and Handling of Dangerous Goods and Hazardous Wastes

29. The Licencee shall collect and dispose of all used petroleum products and other hazardous wastes generated by the machinery used in the construction and operation of the Development in accordance with Sustainable Development and legislative requirements.

30. The Licencee shall ensure fuel storage containers incorporate secondary containment satisfactory to an Environment Officer.

31. The Licencee shall comply with all the applicable requirements of:
    a) Manitoba Regulation 188/2001, or any future amendment thereof, respecting Storage and Handling of Petroleum Products and Allied Products;
    b) The Dangerous Goods Handling and Transportation Act, and regulations issued thereunder, respecting the handling, transport, storage and disposal of any dangerous goods brought onto or generated at the Development; and
    c) the Office of the Fire Commissioner – Province of Manitoba.

32. The Licencee shall establish any fuel storage areas required for the construction and operation of the Development a minimum distance of 150 metres from any waterbody, excluding drainage ditches.

33. The Licencee shall, during construction and maintenance of the Development, operate, maintain, and store all materials and equipment in a manner that prevents any deleterious substances including fuel, oil, grease, hydraulic fluid, coolant, and other similar substances from entering any waterbody. An emergency spill kit for in-water use shall be readily available on site during construction.

Environmental Accident Reporting

34. The Licencee shall, in the case of physical or mechanical equipment breakdown or process upset where such breakdown or process upset results or may result in the release of a pollutant in an amount or concentration, or at a level or rate of release, that causes or may cause a significant adverse effect, immediately report the event by calling the 24-hour environmental emergency response line at 204-944-4888 or toll-free at 1-855-944-4888 pursuant to the Notice and Reporting Regulation 126/2010, or any future amendment thereof. The report shall indicate the nature of the event, the time and estimated duration of the event and the reason for the event.

35. The Licencee shall, following the reporting of an event pursuant to Clause 34:
    a) identify the repairs required to the mechanical equipment;
    b) undertake all repairs to minimize unauthorized discharges of a pollutant;
    c) complete the repairs in accordance with any written instructions of the Director; and
    d) submit a report to the Director about the causes of breakdown and measures taken, within one week of the repairs being done.

36. The Licencee shall, in a manner approved by the Environment Officer, remove and dispose of all spilled dangerous goods and pollutants.

Noise

37. The Licencee shall not cause or permit a noise nuisance to be created as a result of the construction, operation, or alteration of the Development, and shall take such steps as the Director may require to eliminate or mitigate a noise nuisance.

Heritage Resources

38. The Licencee shall, during construction and operation of the Development, apply measures to protect heritage resources, as prescribed in the Peatland Management Plan and Historic Resources Protection Plan and as may be directed by Historic Resources Branch.

Monitoring, Record Keeping, and Reporting

39. The Licencee shall, throughout the draining and harvesting of the site of the Development, but only under conditions of effluent release:
    a) collect samples of the effluent at all locations dentified in Appendix "A" attached to this Licence and have them analyzed at such frequencies as specified in Schedule 'A', for such substances and characteristics as specified in Schedule 'B' attached to this Licence; and
    b) once per week, measure and record the flow rate (in cubic metres per second) of effluent being released from each final discharge point of the Development, and use the weekly flow rate measurements to determine an estimate of the total monthly volumes (expressed in cubic metres) of effluent released from each final discharge point of the Development;

    unless otherwise specified in writing by the Director.

40. The Licencee shall, if effluent monitoring pursuant to Clause 39 has potentially impacted downstream receiving waters, undertake the following:
    a) notify the Environment Officer responsible for this file;
    b) implement a downstream water monitoring plan to verify water quality of downstream receiving water in relation to current Manitoba Water Quality Standards, Objectives, and Guidelines of known background levels; and
    c) submit a report on the results of the monitoring plan to the Environment Officer responsible for this file.

41. The Licencee shall maintain records onsite available for inspection of the analytical data, and flow rate measurements recorded in accordance with Clause 39 of this Licence.

Decommissioning and Recovery

42. The Licencee shall:
    a) until such time that a Peatland Recovery Plan is approved pursuant to the Peat Harvesting Licence no. 3 pursuant to The Peatlands Stewardship Act, comply with the Mine Closure Regulation 67/99, or any future amendment thereof, particularly in regards to addressing environmental issues including, but not necessarily limited to:

i) implementation of a restoration plan that includes the re-establishment of self-regulatory mechanisms and a return of the affected areas to functional peat accumulating ecosystems;
ii) the implementation of any progressive restoration of those peat bog areas of the Development where harvesting has reached its terminal depth;
iii) the decommissioning of any temporary fuel storage site used at or for the Development;
iv) the decommissioning of access and bog roads, stream crossings, and power lines constructed for the Development;
v) the decommissioning, reclamation and restoration of the overall affected operational area of the Development;
vi) the restoration or replacement of wildlife or fish habitats disturbed, adversely affected, or lost as a result of the Development;
vii) the containment, control, or treatment of pollutants originating from the harvest site of the Development; and
viii) the strategy, scope, frequency, and duration of post-closure environmental monitoring activities at the harvest site;

where applicable; and

b) provide the Director with:
i) written notice three months in advance of any imminent permanent closure of this Development; or
ii) an immediate written notice of any sudden decision to temporarily close this Development whereby the Development would be placed in a mothballed state for re-opening in the foreseeable future; and
iii) in the course of progressive reclamation and restoration, as well as upon the permanent or temporary closure of this Development, implement the environmentally related aspects of the Closure Plan approved pursuant to the Mine Closure Regulation 67/99, or any future amendment thereof, to the satisfaction of the Director.

43. The Licencee shall, within 60 days of the approval of the Peatland Recovery Plan for sub areas Evergreen 2 and Evergreen 3 of Peat Harvesting Licence No. 3, submit for Director approval a peat recovery plan for all privately owned land located in Sections 3, 4, 5, 9 and 10, Township 13, Range 10 EPM.

44. The Licencee shall, upon approval of the Peatland Recovery Plan pursuant to Peat Harvest Licence No. 3, follow the monitoring program and assessment protocols set out in their Peatland Recovery Plan for Evergreen 2 and Evergreen 3 sub areas.

Annual Report

45. The Licencee shall submit an annual report to the Environment Officer responsible for this Licence, by no later than February 28th each year, including an annual summary containing the following information:
a) a discussion and trend analysis of all the analytical values, measurements, and estimates determined and recorded pursuant to Clauses 39 of this Licence;

b) a comparison of measurements to Manitoba Water Quality Standards Objectives, and Guidelines, or future amendments thereof;
c) annual report on land recovery; and,
d) a summary of adaptive management strategies implemented to mitigate previously identified or anticipated non-compliance issues with this Licence;
in an acceptable electronic format and in writing if requested.

Progress of Recovery

46. The Licencee shall consult a specialist in restoration ecology for Manitoba if the annual monitoring of the progression of the recovery suggests a progression rate which is unsatisfactory to the Director.

Future Monitoring and Research

47. The Licencee shall participate in monitoring and research activities related to the development of best practice standards in cooperation with Sustainable Development.

Alterations to the Development

48. The Licencee shall obtain written approval from the Director for any proposed alteration to the Development before proceeding with the alteration.

REVIEW OR REVOCATION

A. Clean Environment Commission Order no. 305 is hereby rescinded.

B. If, in the opinion of the Director, the Licencee has exceeded or is exceeding or has or is failing to meet the specifications, limits, terms, or conditions set out in this Licence, the Director may, temporarily or permanently, revoke this Licence.

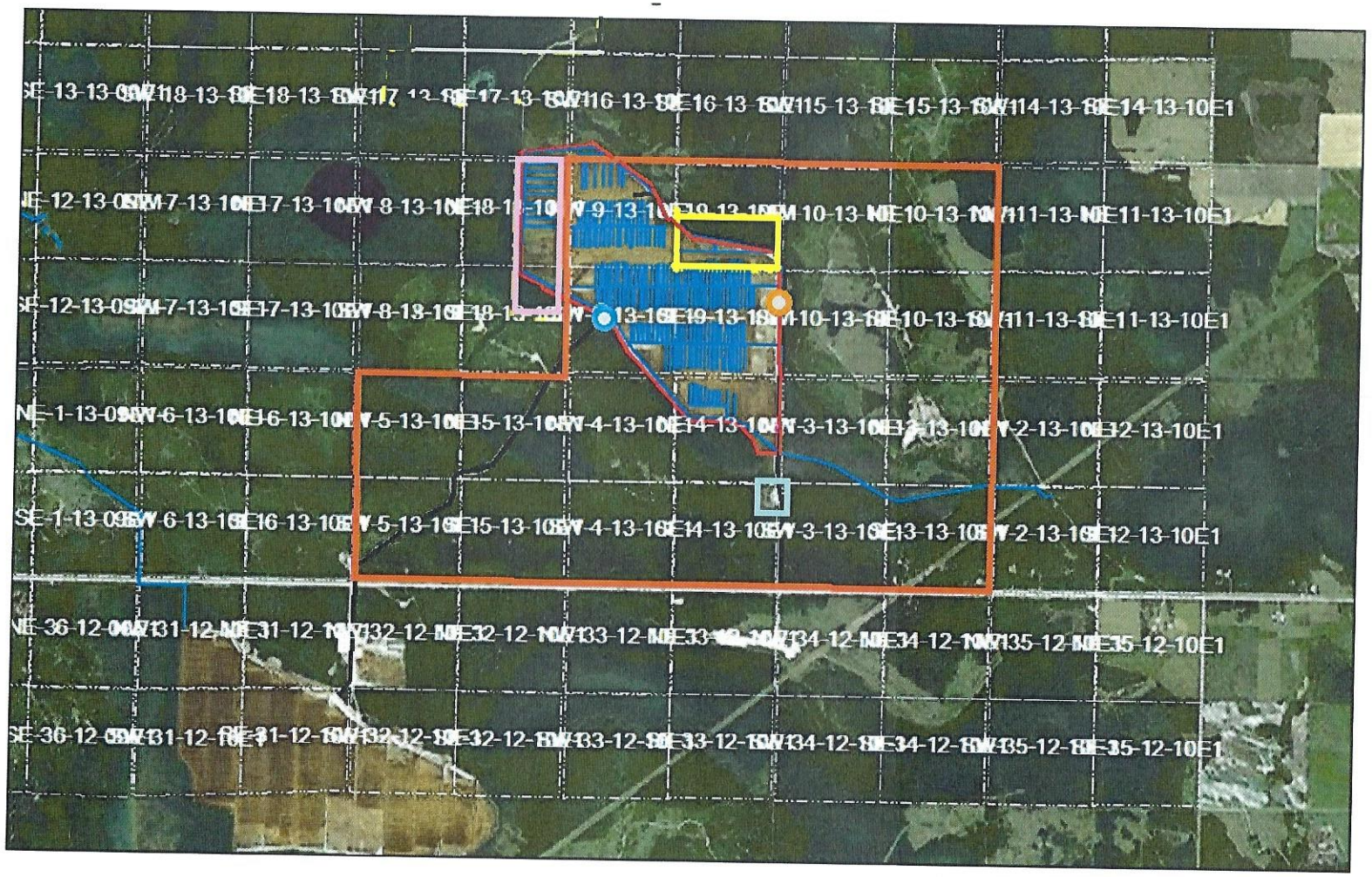
C. If, in the opinion of the Director, new evidence warrants a change in the specifications, limits, terms or conditions of this Licence, the Director may require the filing of a new proposal pursuant to Section 11 of The Environment Act.

Tracey Braun

Tracey Braun, M.Sc.
Director
Environment Act

File: 628.00

APPENDIX 'A' to licence 305 R



SCHEDULE 'A' to licence 305 R

Area	Source	Location	Sampling Frequency*	Determinations or Analyses
Interior Perimeter Drainage Ditches	Effluent	Stations "EG West" and "EG East"- within perimeter ditches (see Appendix A).	Weekly & 3x/year	See "Schedule B"

* "weekly" means one sample every seven days, but on an operating day.
"3x/year" means one sample every spring freshet, late summer and late fall.

Note: The Director reserves the right to make future alterations to this Schedule in the interests of effective environmental management.

SCHEDULE 'B' to licence 305 R

Parameters / Characteristics / Data	Effluent (weekly) *	Effluent (3x / Year)*
Sampling Date	X	X
Flow rate	X	
pH	X	X
Total Alkalinity		X
Acidity		X
Conductivity		X
Total Dissolved Solids		X
Total Suspended Solids	X	X
5-day Biochemical Oxygen Demand		X
Hardness		X
Total Kjeldahl Nitrogen		X
Total ammonia (as N)		X
Total organic carbon		X
Nitrate + Nitrite (as N)		X
Sulphates (as S)		X
Total and dissolved metals and metalloids:		
Aluminum (Al)		X
Antimony (Sb)		X
Arsenic (As)		X
Barium (Ba-		X
Beryllium (Be)		X
Bismuth (Bi)		X
Boron (B)		X

Parameters / Characteristics / Data	Effluent (weekly)*	Effluent (3x / Year)*
Total and dissolved metals and metalloids (continued):		
Cadmium (Cd)		X
Calcium (Ca)		X
Cesium (Cs)		X
Magnesium (Mg)		X
Manganese (Mn)		X
Mercury (cold vapour)		X
Molybdenum (Mo)		X
Nickel (Ni)		X
Phosphorus (P)		X
Potassium (K)		X
Rubidium (Rb)		X
Selenium (Se)		X
Silicon (Si)		X
Silver (Ag)		X
Sodium (Na)		X
Strontium (Sr)		X
Tellurium (Te)		X
Thallium (Tl)		X
Thorium (Th)		X
Tin (Sn)		X
Titanium (Ti)		X
Tungsten (W)		X
Uranium (U)		X

continued...

Total and dissolved metals and metalloids (continued):		
Vanadium (V)		X
Zinc (Zn)		X

"weekly" means one sample every seven days, but on an operating day.
"3x/year" means one sample every spring freshet, late summer and late fall.

Note: The Director reserves the right to make future alterations to this Schedule in the interests of effective environmental management.

SCHEDULE 'C' to licence 305 R

	Total Area (ha)	Property Ownership
Evergreen 2	48.5	Crown Land
Evergreen 3	32.2	Crown Land
Sections 3, 4, 5, 9 and 10 Township Range 10 EPM	1267.8	Private Land Only
TOTAL AREA =	1348.5 ha	

APPENDIX B

Site Photographs

Photo 1: Existing access road on east side of Evergreen 1 sub-area. Evergreen 2/3 outlet ditch is to the right.

Photo 2: Existing staging area at south side of Evergreen 2/3 harvest area.

Photo 3: Existing harvest area at Evergreen 2/3.

Photo 4: Existing outlet ditch for Evergreen 2/3.

Photo 5: Existing overland discharge area at end of Evergreen 2/3 outlet ditch.

Photo 6: Unnamed lake within Evergreen 1 at south side (June 2020).

Photo 7: Unnamed lake within Evergreen 1 at north side (June 2020).

Photo 8: Standing water within peat. Water sampling location EG-4.

Photo 9: Typical black spruce bog within Evergreen 1.

Photo 10: Central Mudminnow caught at EG-01, June 4, 2020.

Photo 11: Brook Stickleback caught at EG-03, June 4, 2020.

Photo 12: Northern Redbelly Dace caught at EG-03, June 4, 2020.

Photo 13: Channel-like waterbody north-east of Evergreen 1 (June 2020).

Photo 14: Pearl Dace caught in the access road ditch line, June 4, 2020.

APPENDIX C

Community Engagement Report

Sun Gro Horticulture Canada Ltd.

COMMUNITY ENGAGEMENT REPORT

Environment Act Proposal for a Peatland Development

At Evergreen 1 Bog sub-area

SCATLIFF + MILLER + MURRAY

&

KGS GROUP

Introduction

KGS Group (KGS), in partnership with Scatliff + Miller + Murray (SMM), is preparing an Environment Act Proposal (EAP) on behalf of Sun Gro Horticulture Canada Ltd. (Sun Gro) for a proposed peatland development of the Evergreen 1 Bog sub-area (sub-area / project). The sub-area is located north of Highway 44, approximately 8 kilometres northeast of Seddons Corner, MB. The sub-area is within an existing Sun Gro Peat Harvest Licence (PHL), adjacent to existing harvesting operations at the Evergreen 2 and 3 sub-areas. The sub-area is 144 hectares, of which up to 60 hectares may be harvested, considering buffer areas and sub-area boundaries.

The sub-area has an estimated 17 years of peat capacity. The scope of the project will include:

- Site preparation and access (vegetation clearing; installing access to-from the sub-area; establishing staging and buffer areas),
- Ground and surface water management (ditching and drainage; overland flow siltation),
- Harvesting and shipping (field harrowing; harvesting; on-site stockpiling and transport to the processing plant near Elma, MB; shipping to customers), and
- Progressive site recovery.

EAPs are required for all proposed environmentally significant developments in Manitoba under The Environment Act. This includes proposed peat harvesting operations. In accordance with EAP requirements, KGS is in process of assessing potential environmental interactions (within a 3 kilometre radius of the project sub-area) and socio-economic interactions (within a 10 kilometre radius of the project sub-area). The EAP will then identify mitigation measures to either eliminate or control potential adverse effects.

Community and stakeholder engagement are also critical to the EAP process. The enclosed report prepared by SMM outlines the communications and engagement activities undertaken by SMM, KGS and Sun Gro representatives (project team) from July/20 to September/20 in support of this EAP. It outlines the process objectives which guided the engagement methods and activities, and also summarizes what was heard and the feedback received.

Engagement Planning

1.1 Public Engagement Plan

The public engagement plan was developed to define the engagement process, including goals and objectives as well as communication and engagement tools. The plan, which is attached to this report in Appendix A, was guided by the principles of transparency and openness, and represented a roadmap for all communication and engagement events in support of this EAP.

The public engagement goals and objectives were as follows:

- Ensure an open and transparent process with clear communication,
- Establish trust and relationships with engagement participants,
- Provide key information clearly and consistently,
- Provide opportunities for early and meaningful engagement,
- Understand and address local community concerns pertinent to the project, and
- Gather information from neighbouring Indigenous communities to address any impacts to their Treaty Rights for hunting, fishing, trapping and gathering, as well as significant cultural or spiritual areas.

As part of the public engagement plan, SMM also created a Stakeholder Profile (Profile) to identify relevant stakeholder groups, based on the following attributes:

- Geography and proximity to the sub-area, and
- Interests in the sub-area and/or issues with the project.

The Profile organized community contacts to assist in connecting with relevant parties and promoting engagement activities. The Profile was reviewed and updated as necessary based on input from the project team and the liaison with the stakeholder groups.

1.2 Engagement Activities

Communications Log

Throughout the project, SMM documented all inquiries, contact information, dates, follow-ups, responses, and action items in a Communications Log. It is attached to this report in Appendix B.

Letter Campaign and Phone Calls

On August 4/20 SMM launched a letter campaign to the stakeholder groups identified in the Profile. The intent of this letter, a sample of which is attached to this report in Appendix C, was as follows:

- Provide information about the project and the EAP process to interested and affected stakeholders,
- Determine stakeholder interest in engaging with the project team about the project, and
- Arrange opportunities for public engagement.

Due to the status of COVID-19 protocols at the time of the engagement activities for this EAP, stakeholders were advised of the following engagement options:

- Introductory Meeting: A virtual meeting (on Zoom) with community leaders / representatives that would provide key project information and offer a forum for listening to comments and concerns about the project, or
- Virtual Presentation: A virtual event (on Zoom) with the broader community that would provide key project information and offer a forum for listening to comments and concerns about the project.

Following receipt of the letter and fact sheet, SMM contacted each stakeholder group by phone to determine if and how they wished to be engaged. The outcome of these phone calls is shown on the Communications Log in Appendix B.

Stakeholder Meetings

2.1 Meeting Details

Based on stakeholder feedback, the project team hosted two introductory virtual meetings (on Zoom):

- One meeting on August 25/20 held jointly with the Rural Municipality (RM) of Brokenhead Council / staff and the Town of Beausejour Council / staff.
- One meeting on September 8/20 with representatives of the Manitoba Metis Federation (MMF). Additional correspondence was exchanged between the MMF and project team leading up to this meeting. This correspondence is attached to this report in Appendix D. It includes:

- A letter from the MMF, dated August 12/20 which focused on MMF's position that this EAP should adhere to Resolution 8, which was adopted by the MMF in 2007, and sets out the framework for engagement, consultation and accommodation with the Metis Community; and

- A letter in response from SMM, dated August 20/20, which clarified that the intent of the outreach by the project team was to be proactive and initiate engagement with the MMF as part of the EAP process. The Provincial government, as a composite part of the 'Crown' with the Federal government, would determine its Duty to Consult obligations under the Canadian constitutional framework, after the EAP had been filed for review with the Manitoba Conservation & Climate's Environmental Approvals Branch.

At both meetings, the project team gave PowerPoint presentations which are attached to this report in Appendix E and Appendix F. The presentations focused on the following topics: an introduction to the project; an overview of the peatland industry in Canada and Manitoba; corporate highlights of Sun Gro; the project itself (context, location and description); the EAP process; and typical environmental issues and mitigation measures related to proposed peat harvesting operations.

At the conclusion of each presentation, the project team answered questions and listened to feedback from the participants about the project. At the end of the meeting, participants were encouraged to complete an anonymous online survey about the meeting and the information presented about the project. Two people completed the survey representing the RM of Brokenhead and/or the Town of Beausejour. Their responses are incorporated into a hard copy of the online survey, which is attached to this report in Appendix G. As highlighted below, both respondents:

- Felt the information presented helped them understand the project and address their concerns, and

- Indicated specific interest in the following project components: pending baseline assessments [ie. hydraulic assessment (surface water, drainage), and biological surveys (fish habitat, vegetation/plant communities)]; and project implementation (ie. ground and surface water management stage, and progressive site recovery stage).

Note no surveys were submitted to the project team from the MMF.

2.2 Meeting Results

Stakeholder feedback from the two meetings is summarized and grouped as follows:

(A) The legislative context:

- Question: Why is the stakeholder engagement occurring so late in the overall review and approvals process for the project?
  Response: As referenced above, the intent of the current stakeholder engagement is to be proactive during the EAP process. Once the EAP has been filed with the Manitoba Conservation & Climate's Environmental Approvals Branch, the Provincial government will determine if additional stakeholder engagement, including engagement with affected Indigenous communities, is required.

- Question: Is the sub-area within an existing PHL issued to Sun Gro?
  Response: Yes, the sub-area is within an existing PHL issued to Sun Gro. But the EAP process has been triggered for the project because it represents a major alteration to the PHL.

(B) The project context:

- Question: Is the sub-area located on Provincial Crown Land?
  Response: Yes, the sub-area is located on Provincial Crown Land.

- Question: What is the status of the Evergreen 2 and 3 harvesting operations?
  Response: The harvesting operations at the Evergreen 2 and 3 sub-areas have two to three years of peat capacity remaining, following which the site recovery phase will be engaged.

- Request: The MMF expressed interest in collaborating further with Sun Gro during the EAP process (sharing knowledge about the area; fieldwork monitoring; peer review of technical reports) and the subsequent project implementation phase (securing contracts for Metis-owned businesses; Metis job training and employment).
  Response: Sun Gro agreed to liaise further with the MMF on these matters. On September 17/20, Sun Gro offered $1,000.00 to the MMF to further advance the engagement process. On September 21/20, the MMF indicated that the $1,000.00 offer from Sun Gro was inadequate and that a more detailed engagement plan and budget should be prepared. On September 22/20, the project team advised the MMF that (1) Sun Gro was not able to offer more than $1,000.00 to the MMF; (2) the project team would

proceed to file the EAP with Manitoba's Conservation & Climate's Environmental Approvals Branch; and (3) after the EAP was filed, the Provincial government would determine its Duty to Consult obligations under the Canadian constitutional framework.

- Request: The MMF requested copies of: the project team presentation; Sun Gro's existing peat harvest licence for the area; and Sun Gro's Peatland Management Plan and Peatland Recovery Plan.
  Response: Following the meeting with the MMF on September 8/20, the project team provided the above documents to the MMF on September 10/20.

(C) The environmental context:

- Question: Will surface water from the project drain into the Brokenhead River?
  Response: The surface water from the project will not discharge into the Brokenhead River. A controlled drainage plan (using ditching and overland flow siltation) will be put in place to direct the surface water to another bog located northeast of the sub-area, from which it will eventually drain into an existing creek network and ultimately discharge into the Winnipeg River.

- Question: Will the project adversely affect at-risk bird species and their habitats?
  Response: Based on the fieldwork to date, no at-risk bird species and habitats have been identified in the sub-area. Appropriate mitigation measures will be put into place, however (e.g. area avoidance), should at-risk bird species and habitats be identified as the fieldwork progresses and/or encountered during the project implementation phase.

(D) The socio-economic context:

- Question: Will the project generate new local employment in the area?
  Response: Sun Gro continues to be committed to training and hiring local residents for jobs. While there will be a slight increase in employment opportunities during the site preparation and access phase, it is anticipated that the employees currently working on the harvesting operations at the Evergreen 2 and 3 sub-areas will be employed for this project.

Next Steps

Once the EAP has been filed with the Manitoba Conservation & Climate's Environmental Approvals Branch, the Provincial government will determine if additional stakeholder engagement, including engagement with affected Indigenous communities as part of the Province's Duty to Consult obligations under the Canadian constitutional framework, is required.

Should this EAP be approved, Sun Gro will then be in a position to begin preparing the site, and then engage harvesting and progressive site recovery activities, in accordance with the PHL.

Prepared by:
Scatliff + Miller + Murray

Wes Paetkau, MCIP, RPP
Senior Planner

Reviewed by:
Scatliff + Miller + Murray

Meaghan Pauls, B.Env.D., M.L.Arch
Landscape Designer

APPENDIX A

PUBLIC ENGAGEMENT PLAN

Sun Gro Peat Harvesting Project

PUBLIC ENGAGEMENT PLAN

This engagement plan focuses on a process that involves interested and affected parties in sharing information and ideas and gathers their input in the project and the overall process. It is critical to implement an engagement strategy with the project team that fulfills the goals of the project, successfully communicates with all the stakeholders, and provides a clear message. Guided by principles of transparency and openness, this plan will act as a roadmap for all engagement events with objectives, methods, details, communications required and timelines. It will highlight the tactics that will be employed to deliver outcomes.

All project communication methods and materials will be vetted through KGS Group and Sun Gro. Check-in Sessions will be scheduled with the group and will be valuable for bringing flexibility to the project in both timing and technique. The goal is to ensure that project information is communicated to interested and affected parties and is suitable, consistent, and timely.

Scatliff+Miller+Murray (SMM) will create a Stakeholder Profile (see page 4) for engagement and organize the stakeholders into Tiers. The profile considers each stakeholder's interest in, or impact from, the project and identifies possible interests and issues. This information is then used to develop the ideal level and type of engagement required for each Tier. The Profile will organize community contacts to assist with connecting with relevant parties and promoting engagement activities. The profile will be reviewed and revised as necessary, with input from participants, KGS Group, and Sun Gro.

Throughout the project, SMM will document all inquiries, contact information, dates, follow-ups, responses, and action items etc. through a Stakeholder Communications Log. This Communications Log will be included in the final Engagement Report. We will work together with the project team to refine our system accordingly and ensure consistent and timely responses. Where applicable, SMM will provide recommendations of mitigation measures in response to participant needs, wants, and concerns.

The engagement goals are:

- Ensure an open and transparent process with clear communication
- Establish trust and relationships with engagement participants
- Provide key information clearly and consistently
- Provide opportunities for early and meaningful engagement
- Understand and address local community concerns pertinent to this project
- Gather information from neighbouring First Nations to address any impacts to their Aboriginal Treaty Rights for hunting, fishing, trapping and gathering, as well as significant cultural or spiritual areas

ENGAGEMENT ACTIVITIES

PHONE CALLS & LETTER CAMPAIGN

GOALS: Introduce the project to interested and affected parties, gather input on engagement preferences, foster project awareness, and share ideas.

KEY OBJECTIVES:

- Connect with interested and affected parties (refer to Stakeholder Profile on page 4)
- Provide information about the project location and process
- Determine interest in engagement
- Arrange opportunities for public engagement

TECHNIQUE:

An initial phone call to introduce the project and inform stakeholders of the letter and fact sheet they will be receiving. The letter and fact sheet will inform them about the project and invite them to receive more information and offer feedback. Through the letter, stakeholders will be advised of methods they can choose from as to how they wish to be engaged: including a virtual meeting with the project team and a select group from community, a virtual presentation open to all community members, or a combined virtual meeting/presentation with other stakeholder groups.

The letter will be accompanied by a two-page fact sheet which will offer information on the project such as location of the peat bog, scope of impacts of peat harvesting activities, and opportunities for public engagement. Following receipt of the letter and fact sheet, a phone call will be made to participants to determine if and how they wish to be engaged.

PARTICIPANT ENGAGEMENT CHOICES

VIRTUAL MEETING (WITH CHIEF AND COUNCIL OR RM COUNCIL)

GOALS: To share project information and identify community priorities and concerns.

KEY OBJECTIVES:

- Share key information on the project process, impacts, and mitigation measures
- Gain understanding of interests, needs, wants, and concerns
- Obtain feedback on process
- Review timeline and next steps
- Respond to comments and questions

TECHNIQUE:

A virtual meeting with community representatives. Depending on the desires of the community, this meeting may include a PowerPoint presentation with key project information or may be a structured conversation to discuss how the community would like to be engaged. Discussion and feedback from these meetings will be documented and summarized for distribution to the client and will be included in the final engagement report.

VIRTUAL PRESENTATION (WITH COMMUNITY MEMBERS OR OTHER STAKEHOLDERS)

GOALS: To share project information and identify community priorities and concerns.

KEY OBJECTIVES:

- Share key information on the project process, impacts, and mitigation measures
- Gain understanding of interests, needs, wants, and concerns
- Obtain feedback on process
- Review timeline and next steps
- Respond to comments and questions

TECHNIQUE:

A virtual presentation using the ZOOM platform will be hosted by KGS Group and SMM staff. This presentation will include relevant images and graphics necessary to introduce the project, provide history and timeline information about peat processing in Manitoba, and describe the potential impacts and subsequent mitigation methods of the harvesting process.

After the presentation, an online survey will be circulated to participants through which they can offer feedback on aspects of the project and the engagement process.

The virtual meeting/presentation will be promoted throughout the community through email, posters, mailbox drops, radio ads, and social media posts.

FINAL REPORT

SMM will provide and summary and analysis of all data gathered from all individuals, groups, organizations, and community members through public engagement events in a final report. This report will be a detailed record of all materials produced and the results of the engagement activities, as well as how comments and questions were responded to throughout the process.

STAKEHOLDER PROFILE

Indigenous Engagement

- Peguis First Nation
- Brokenhead Ojibway Nation
- Manitoba Metis Federation
- Sagkeeng First Nation
- Black River First Nation
- Shoal Lake 40 First Nation
- Wabaseemoong Independent Nation

Municipal Engagement

Letter with engagement option:

- RM of Lac du Bonnet
    - Seddons Corner (part)
- RM of Reynolds
    - Seddons Corner (part)
    - Molson
- RM of Brokenhead
- RM of Whitemouth
    - River Hills / Seven Sisters Falls
    - Brookfield
    - Elma
    - Oldenburg
    - Sieg's Corner
    - Shelley
    - Whitemouth
- Town of Beausejour

Organization Engagement (optional)

- Manitoba Trappers Association Zone 4

APPENDIX B

PROJECT TEAM COMMUNICATIONS LOG

Sun Gro Peat Harvesting
updated September 23, 2020

Communication Log

Participant / Group	Contact Person	Email	Phone No.	Contact Type (ie. email, phone) [Contact Person] Date	Notes	Engagement Plan
Peguis First Nation	Chief Glenn Hudson	chiefglennhudson@mymts.net	204-330-4371	Email [MP] Aug 4, 2020	Letter and Fact Sheet emailed to Chief Hudson	
				Mail [MP] Aug 5, 2020	Letter and Fact Sheet mailed to Chief Hudson and Peguis First Nation	
				Phone [MP] Aug 7, 2020	MP left VM for Chief Hudson to call back and ensure they received letter	
				Email [MP] Aug 7, 2020	Follow up email to confirm receipt of letter	
Brokenhead Ojibway Nation	Chief Deborah Smith	bsmith@brokenheadojibwaynation.com	204-766-2494	Email [MP] Aug 4, 2020	Letter and Fact Sheet emailed to Chief Deborah Smith	
				Mail [MP] Aug 5, 2020	Letter and Fact Sheet mailed to Chief Deborah Smith and Brokenhead Ojibway Nation	
				Phone [MP] Aug 7, 2020	MP left VM for Bev Smith + message for Chief Deborah Smith to call back to ensure received letter and discuss project	
				Email [MP] Aug 7, 2020	Follow up email to confirm receipt of letter	
				Email [Bev Smith] August 7, 2020	Bev follow up to confirm receipt and asked for summary of project.	
				Email [MP] Aug 7, 2020	MP followed up with simpler summary of project	
Sagkeeng First Nation	Chief Derrick Henderson	cao@sagkeeng.ca	204-367-2287	Email [MP] Aug 4, 2020	Letter and Fact Sheet emailed to Chief Henderson	
				Mail [MP] Aug 5, 2020	Letter and Fact Sheet mailed to Chief Henderson and Sagkeeng First Nation	
				Phone [MP] Aug 7, 2020	MP left VM for Chief Henderson to ensure received letter and to discuss project	
				Email [MP] Aug 7, 2020	Follow up email to confirm receipt of letter	
Black River First Nation	Chief Sheldon Kent	admin@black-river.ca	204-367-4411	Email [MP] Aug 4, 2020	Letter and Fact Sheet emailed to Chief Kent	
				Mail [MP] Aug 5, 2020	Letter and Fact Sheet mailed to Chief Kent and Black River First Nation	
				Phone [MP] Aug 7, 2020	Left message for Chief Kent to call back to ensure received letter and to discuss project	
				Email [MP] Aug 7, 2020	Follow up email to confirm receipt of letter	
Shoal Lake 40 First Nation	Chief Erwin Redsky	sl40secretary@hotmail.ca	807-733-2315 807-733-1287 (Chief Redsky's Office)	Email [MP] Aug 4, 2020	Letter and Fact Sheet emailed to Chief Redsky	
				Mail [MP] Aug 5, 2020	Letter and Fact Sheet mailed to Chief Redsky and Shoal Lake 40 First Nation	
				Phone [MP] Aug 7, 2020	Left message for Chief Redsky to call back (currently in meeting); receptionist didn't receive letter	
				Email [MP] Aug 7, 2020	MP resent letter to receptionist based on her request	
Wabaseemoong Independent Nation	Chief Waylon Scott	chiefscott@hotmail.com	807-927-2000	Email [MP] Aug 4, 2020	Letter and Fact Sheet emailed to Chief Scott	
				Mail [MP] Aug 5, 2020	Letter and Fact Sheet mailed to Chief Scott and Wabaseemoong Independent Nation	
				Phone [MP] Aug 7, 2020	Left message for Chief Scott to call back to ensure received letter and to discuss project	
				Email [MP] Aug 7, 2020	Follow up email to confirm receipt of letter	
Manitoba Metis Federation	Minister Denise Thomas (Vice President)	dthomas@mmf.mb.ca info@mmf.mb.ca	204-754-2721	Email [MP] Aug 4, 2020	Letter and Fact Sheet emailed to Minister Denise Thomas	**Virtual Presentation** (with Engagement &
				Mail [MP] Aug 5, 2020	Letter and Fact Sheet mailed to Minister Denise Thomas and MMF	Consultation Dept and Energy, Infrastructure,
				Email [MMF Communications] Aug 6, 2020	Letter forwarded to Minister Thomas for response.	and Resource Management Department)
				Phone [MP] Aug 7, 2020	Left message for Minister Thomas to call back to ensure received letter and to discuss project	September 8, 2020 10am
				Email [MMF Communications] Aug 19, 2020	Received letter from Jasmine Langhan (Director of Engagement & Consultation)	
				Email [MP] Aug 20, 2020	SMM/KGS responded to MMF with letter	
				Email [MB] Aug 25, 2020	Morrissa Boerchers [MB] identified that the MMF would like to meet for a virtual Introductory Meeting	
				Email [MP] Sept 10, 2020	Follow up email from MP after virtual meeting with survey and additional documents for information.	
				Email [MP] Sept 17, 2020	Sun Gro offered funding of $1,000 to MMF to advance the engagement process.	
				Email [SH] Sept 21, 2020	MMF indicated the funding offer of $1,000 is inadequae and would like to develop a workplan and budget	
				Email [MP] Sept 22, 2020	MP indicated Sun Gro is not able to offer more than $1,000 and will submit the EAP to engage the Province of Manitoba	

Sun Gro Peat Harvesting
updated September 23, 2020

Communication Log

Participant / Group	Contact Person	Email	Phone No.	Contact Type (ie. email, phone) [Contact Person] Date	Notes	Engagement Plan
RM of Lac du Bonnet	Cameron Bell	cao@lacdubonnet.com	204-345-2619	Email [MP] Aug 4, 2020	Letter and Fact Sheet emailed to Cameron Bell	
				Mail [MP] Aug 5, 2020	Letter and Fact Sheet mailed to Cameron Bell and RM of Lac du Bonnet	
				Phone Message [WP] Aug 7, 2020	Follow up voice mail to confirm receipt of letter	
RM of Reynolds	Kim Furgala (CAO) Sherri Pearch (ACAO)	cao@rmofreynolds.com acao@rmofreynolds.com	204-426-5305	Email [MP] Aug 4, 2020	Letter and Fact Sheet emailed to RM of Reynolds	**No comments and no engagement**
				Mail [MP] Aug 5, 2020	Letter and Fact Sheet mailed to RM of Reynolds	**necessary.**
				Email [Sherri Pearch] Aug 5, 2020	SP will add it to agenda for council meeting on August 11th. Will discuss with council and questions and concerns will be brought to MP.	
				Email [SP] Aug 17, 2020	SP informed that Council has no comments.	
RM of Brokenhead	Councillor Luke Ingeberg - planning district is within his portfolio	lingeberg@rmofbrokenhead.ca	204-268-6700	Email [MP] Aug 4, 2020	Letter and Fact Sheet emailed to Councillor Luke Ingeberg	**Virtual Presentation (with Council)**
				Mail [MP] Aug 5, 2020	Letter and Fact Sheet mailed to Councillor Luke Ingeberg and RM of Brokenhead	August 25, 5pm (with Town of Beausejour)
				Phone conversation [WP] with Sue Sutherland, CAO Aug 7, 2020 (wrong no. for LI)	LI forwarded Aug 4, 2020 letter to SS; SS added it to agenda for council meeting on August 11th, which will include Town of Beausejour representation; will discuss with council and questions and concerns (RM-Town) will be brought to WP.	
				Email [SS] Aug 12, 2020	SS requested a Virtual Presentation with the Town of Beausejour (with council only)	
RM of Whitemouth	Colleen Johnson (CAO)	cao@rmwhitemouth.com	204-348-2221	Email [MP] Aug 4, 2020	Letter and Fact Sheet emailed to Colleen Johnson	
				Mail [MP] Aug 5, 2020	Letter and Fact Sheet mailed to Colleen Johnson and RM of Whitemouth	
				Email [Colleen Johnson] Aug 4, 2020	Confirmed receipt of letter	
				Phone Message [WP] Aug 7, 2020	Out of office, returning Aug 11, 2020	
				Phone conversation [WP] with CJ, CAO Aug 11, 2020	CJ will take to Council's August 11th council meeting and advise after that. Note the RM Reeve is a former manager with Sun Gro and CJ's spouse is a member of the MB Trappers Association; CJ also commended team on engagement program.	
Town of Beausejour	Vesuvia (Vee) Scromeda (CAO)	cao@townofbeausejour.com	204-268-7550	Email [MP] Aug 4, 2020	Letter and Fact Sheet emailed to Vesuvia Scromeda	**Virtual Presentation (with Council & CAO)**
				Mail [MP] Aug 5, 2020	Letter and Fact Sheet mailed to Vesuvia Scromeda and Town of Beausejour	August 25, 5pm (with RM of Brokenhead)
				Email [Vesuvia Scromeda] Aug 5, 2020	VS will take to Council's August 11th council meeting and advise after that (also see Aug 7, 2020 entry for RM of Brokenhead).	
				Email [VS] Aug 12, 2020	VS confirmed Council & CAO would like a Virtual Presentation. MP followed up to discuss time and with whom.	
Manitoba Trappers Association Zone 4	Lise Carbonneau	mta@mts.net	204-295-1512	Email [MP] Aug 4, 2020	Letter and Fact Sheet emailed to Lise Carbonneau	
				Mail [MP] Aug 5, 2020	Letter and Fact Sheet mailed to Lise Carbonneau and Manitoba Trappers Association Zone 4	
				Phone Message [WP] Aug 7, 2020	Follow up voice mail to confirm receipt of letter	
				Phone conversation [WP] with LC Aug 13, 2020	LC will re-forward letter to Rob Andrushuk (President) and copy SMM team for follow-up / connection.	

APPENDIX C

SAMPLE LETTER TO STAKEHOLDER GROUPS

1120-201 Portage Ave.
Winnipeg, MB R3B 3K6
204 . 927 . 3444
www.scatliff.ca

August 4, 2020

Town of Beausejour
639 Park Avenue
P.O. Box 1028
Beausejour, MB
R0E 0C0

Attention: Vesuvia Scromeda and council

RE: Sun Gro Horticulture Canada Ltd.
Environmental Act Proposal, Peatland Development, Evergreen 1 Bog sub-area

Dear Vesuvia Scromeda:

KGS Group (KGS) and Scatliff + Miller + Murray (SMM) are submitting this letter on behalf of Sun Gro Horticulture Canada Ltd. (Sun Gro). We are preparing an Environment Act Proposal (EAP) for a peatland development of the Evergreen 1 Bog sub-area within an existing Sun Gro Peat Harvest Licence (PHL). The Evergreen 1 sub-area is adjacent to existing harvesting operations at the Evergreen 2 and 3 sub-areas. Obtaining an Environment Act Licence is a requirement for proposed peat harvesting developments. KGS and SMM are issuing this letter to provide a brief description of the project.

The Environmental Assessment process will consider any environmental concerns for the project and be carried out based on project information provided by Sun Gro and advice documents from Manitoba Conservation and Climate. Additional considerations will include environmental information acquired from literature and internet searches, publications by the peat industry and environmental organizations, contacts with federal and provincial government representatives, engagement with stakeholders, and site investigations which have been conducted by the project team.

The proposed peat development is located north of Hwy 44 approximately 8 km north east of Seddons Corner, Manitoba. The sub- area is 144 ha in size, within which up to 60 ha may be harvested considering buffer areas at water bodies and sub-area boundaries. There are two small circular lakes, each approximately 200 – 300 metres in diameter, within the sub-area boundary. Direct and indirect biological and physical environmental effects of the project will be considered within the project study areas which covers a 3 km radius surrounding the sub-area boundary (4,511 ha), while socio-economic effects will be considered in the regional study area which includes a 10 km radius surrounding the sub-area boundary (36,623 ha; Figure 1). We have attached a Fact Sheet about Peat Harvesting, Sun Gro, and Evergreen 1 Bog for additional information.

The scope of the project will include planning, designing, constructing, operating, and maintaining, as well as the eventual decommissioning and restoration of the proposed peatland development at Evergreen 1 Bog. Evergreen 1 Bog has an estimated 17 years of peat capacity which can be harvested over this time

starting once all licensing and permitting requirements have been fulfilled. As well, the project will include development of an access road, site drainage, and an on-site stockpiling area. Major project activities will include providing access, clearing vegetation and surface soils, field preparation (construction of drainage), stockpiling unprocessed peat, and transporting, restoring, and reclaiming harvested peatland.

The assessment for the proposed development will include identification, assessment, and mitigation of adverse environmental effects of the project, and evaluation of the significance of residual environmental effects. This will consist of both direct and indirect biophysical and socio-economic effects. The need for the project, alternatives, and requirements for a follow-up will be considered in the assessment.

Potential environmental concerns being considered in the EAP include: air quality; soil integrity and quality; surface water quality; wetland health; groundwater quality; aquatic and terrestrial vegetation (with special emphasis on species of conservation concern); wildlife (with special emphasis on species of conservation concern); fish and fish habitat; and social and economic conditions associated with the proposed development.

KGS and SMM would like to offer the Town of Beausejour the opportunity to provide any comments or concerns regarding the proposed development so they can be addressed and incorporated into the EAP. We would like to offer some options for facilitating a conversation, providing project information, identifying your community's priorities, and hearing your feedback. You may select one or both of your choosing. Here are two engagement choices we would like to offer for your consideration:

1. **Introductory Meeting** – A virtual meeting (on Zoom) with Town of Beausejour Council members and other community members (as identified by Town Council), to identify how the community would like to be engaged, learn about key project information, and to hear initial comments and concerns regarding the proposed development.
2. **Virtual Presentation** – A virtual event (on Zoom) with the community that will include a presentation by our team with relevant images and graphics to introduce the project, provide context and information about peat processing in Manitoba, and describe the potential impacts and subsequent mitigation methods of the harvesting process.

If you would like an Introductory Meeting and/or Virtual Presentation, please let us know as soon as possible, or at the latest, by August 14, 2020. We would love to meet with you between August 10th to 26th. If you prefer to submit your comments in writing, please do so by August 26th, 2020 as a draft of the EAP will be issued for review soon after that time. Any comments received after that date would be included into the final EAP submission to Manitoba Conservation and Climate who will post the document on the Public Registry for review.

Should you have any questions, comments or concerns, please do not hesitate to contact the undersigned at (204)-927-3444 or via email at mpauls@scatliff.ca.

Sincerely,

Meaghan Pauls, M.L.Arch.
Public Engagement Specialist

What is the Evergreen 1 Bog Project?

Fact Sheet

Timeline

Fall 2020
Submit Environmental Act Proposal

2021
Obtain Environmental Act Licence

2021 - 2022
Begin site preparation, begin harvesting

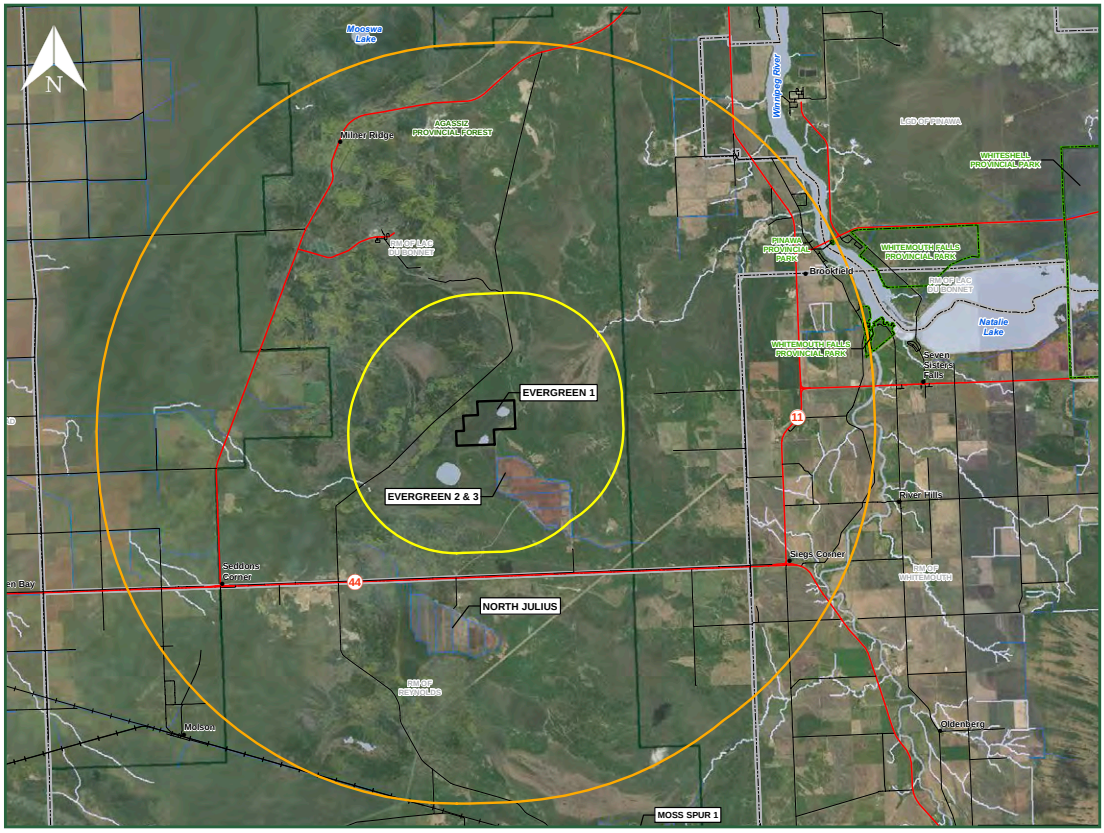
2039
End of peat harvesting, begin site restoration

The Project

The proposed project includes harvesting up to 60 ha of peat at the Evergreen 1 sub-area within the existing Julius Peat Harvest Licence No. 3. The proposed harvest location is adjacent to existing harvesting operation at the Evergreen 2 and 3 sub-areas. The harvest area is anticipated to be in operation for 17 years. Harvested peat is transported to a peat processing facility where it is prepared and packaged for horticultural purposes. Obtaining an Environment Act Licence is a requirement for proposed peat harvesting developments.

KGS will be assessing the following environmental factors:

- air quality
- soil integrity and quality
- surface water quality
- wetland health
- groundwater quality
- aquatic and terrestrial vegetation
- wildlife
- fish and fish habitats
- social and economic considerations associated with the proposed development



We want to hear from you

KGS Group and Scatliff + Miller + Murray would like to invite you to provide comments or concerns regarding the proposed development.

Your concerns may be addressed, mitigated and / or incorporated into the Environment Act Proposal.

If you have questions, comments or concerns, please do not hesitate to contact Meaghan Pauls.

(204) 927-3444

mpauls@scatliff.ca

Learn about Peat Harvesting

Fact Sheet

How is Peat Harvested:

1

Remove existing surface vegetation

2

Construct drainage to lower water content of peat

3

Levelling, crowning, and harrowing of harvest area

4

Harvesting the peat

Peat Moss Facts:

- Canada has more than 281 million acres of peatlands (25% of the world's supply).
- Less than 0.03% of Canadian peatlands have been harvested
- The amount of peat moss harvested from Canadian peatlands every year is nearly 60 times less than the total annual accumulation of new peat moss.

Why is Peat Harvesting Important

Peat is used for:

Improves Green Spaces

Plants are nurtured by peat moss beautifying our parks, green spaces, gardens and patios. Plant-filled green spaces improve our environment.

Food Production

Many of North America's commercial growers rely on high quality peat moss and peat based growing medium to produce food, including tomatoes.

Starting Seeds

Peat moss is valued by horticulturalists because it is able to retain a high level of moisture and oxygen without becoming waterlogged or heavy. It is an ideal choice to start seeds.

sungro HORTICULTURE

Our Expertise is Growing©

RESPONSIBLY MANAGED PEATLANDS CERTIFIED SCS GLOBAL SERVICES VERIFLORA® PROGRAM

sustainable peatland management

Who is Sun Gro Horticulture?

Sun Gro is committed to maintaining Canadian peatlands as an abundant renewable resource. Only bogs that can be restored are selected to be harvested and are restored as soon as they can after harvesting.

Mission: Sun Gro Horticulture's mission is to be an industry leader in soilless growing mixes, serving horticultural professionals, retailers, and gardeners with superior quality, branded growing mixes that yield exceptional results.

Environmental Values:
Sun Gro employs the newest research, developments and management practices to ensure this valuable natural resource remains plentiful and renewable.

Figure 1

690000 700000 710000

5560000

5550000

N W E S

Allegra

Mooswa Lake

Milner Ridge

AGASSIZ PROVINCIAL FOREST

RM OF LAC DU BONNET

RM OF BROKENHEAD

LEE RIVER WILDLIFE MANAGEMENT AREA

Winnipeg River

LGD OF PINAWA

WHITESHELL PROVINCIAL PARK

PINAWA PROVINCIAL PARK

WHITEMOUTH FALLS PROVINCIAL PARK

Brookfield

RM OF LAC DU BONNET

Natalie Lake

WHITEMOUTH FALLS PROVINCIAL PARK

Seven Sisters Falls

EVERGREEN 1

EVERGREEN 2 & 3

11

River Hills

Siegs Corner

RM OF WHITEMOUTH

Seddons Corner

Golden Bay

44

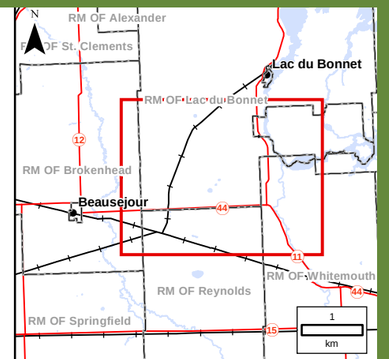
NORTH JULIUS

RM OF REYNOLDS

Molson

Oldenberg

MOSS SPUR 1



LEGEND:

- Regional Study Area
- Project Study Area
- Evergreen 1 Sub-area Boundary
- Major Road
- Road
- Street
- Railway
- River
- Ditch
- Lake
- Provincial Park
- Wildlife Management Area
- Provincial Forest

NOTES:

1. Image Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.
2. All units are metric and in metres unless otherwise specified. Transverse Mercator Projection, NAD 1983, Zone 14. Elevations are in metres above sea level (MSL).

DRAFT

1 0 1 2 3 4

Kilometres

SCALE: 1:100,000 METRIC 11"x17"

NO.	YY/MM/DD	DESCRIPTION	ISSUED BY	CHECK BY
A	20/07/28	ISSUED FOR INFORMATION	SFM	XXX

REVISIONS / ISSUE

KGS GROUP

sungro HORTICULTURE

EVERGREEN 1 BOG – ENVIRONMENT ACT LICENCE

REGIONAL SITE LOCATION

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

JULY 2020 | FIGURE 01 | REV: A

Figure 1

APPENDIX D

CORRESPONDENCE WITH THE MANITOBA METIS FEDERATION

MANITOBA METIS FEDERATION INC.

300 - 150 Henry Avenue, Winnipeg, Manitoba R3B 0J7

Phone: (204) 586-8474 Fax: (204) 947-1816 Website: www.mmf.mb.ca

David Chartrand, LL.D. (Hon)
President

August 12, 2020

*****VIA E-MAIL*****

Ms. Meaghan Pauls
Public Engagement Specialist
Scatliff + Miller + Murray
Suite 1120-201 Portage Ave
Winnipeg, MB, R3B 3K6

Dear Ms. Pauls:

Re: Sun Gro Horticulture Canada Ltd.
Environmental Act Proposal, Peatland Development, Evergreen 1 Bog sub-area

The Manitoba Metis Federation (the "MMF") is in receipt of your letter addressed to Vice President Thomas regarding the Environment Act Proposal for a Peatland Development of the Evergreen 1 Bog sub-area (the "Project"), received August 6, 2020. Your notice has been forwarded to the Energy, Infrastructure, and Resources Management ("EIRM") Department for internal review. Note a project-specific response will be forthcoming.

The MMF is the self-governing representative for the Metis Nation's Manitoba Metis Community (the "Community"), and as such, is entrusted to promote, protect, and advance the collective rights of its Citizens. The MMF represents the Metis Citizens, including Harvesters, who use the lands, waters, and resources throughout the province of Manitoba. It is of paramountcy that the rights, interests, and claims of the Community be recognized and respected.

The MMF is mandated to promote, protect, and advance the collectively held Aboriginal rights of the Community. In 2007, the MMF adopted Resolution No. 8 that sets out the framework for engagement, consultation, and accommodation with the Community. Designed by Metis—for Metis—Resolution No. 8 sets out the process that is to be followed by governments, industry, and other proponents when developing plans or projects that have the potential to impact the section 35 rights, interests, and claims of our Community. It was unanimously passed by MMF Citizens and mandates a "one-window" approach to consultation and engagement with the Community through the MMF Home Office.

In engaging the MMF, on behalf of the Community, the Resolution No. 8 Framework calls for the implementation of five phases:

Phase I: Notice and Response;

Phase II: Funding and Capacity;
Phase III: Engagement and Consultation;
Phase IV: Partnership and Accommodation; and,
Phase V: Implementation.

As per the Resolution No. 8 Framework, the MMF Home Office is the central point of contact for all consultation and engagement on behalf of the Community. It is up to the MMF Home Office to communicate directly with its Regions and Locals on any project that could impact the rights, interests, or claims of the Manitoba Metis Community. As such, please ensure all future correspondence is addressed to the attention of President Chartrand and copied to the Director of Engagement and Consultation (Jasmine Langhan). This process ensures the appropriate MMF Ministers, Regions, and Locals are notified. As the MMF has previously worked with KGS Group we are disappointed to see that Resolution No. 8 was not followed despite being aware of the process.

The proposed Project is located within the Recognized Metis Harvesting Area - an area in which the provincial Crown has recognized the section 35 Metis harvesting rights of our Community, including hunting, trapping, fishing and gathering for food and domestic use. Our Citizens, including harvesters continue to use and rely on this area to exercise their rights today. Therefore, a full, proper, and meaningful engagement and consultation process with the Manitoba Metis Community, through the processes as set out above will need to be followed.

Please note the MMF Project lead will be Morrissa Boerchers, Environmental Assessment Coordinator within our EIRM Department. Please contact her via telephone at 204-586-8474, extension 269, or via email at morrissa.boerchers@mmf.mb.ca if you have any questions regarding this letter. In the interim, the MMF respectfully requests clarification regarding which "advice documents from Manitoba" you reference in your letter to gain a better understanding of information-sharing between the Province and Proponents.

The MMF looks forward to working collaboratively with KGS Group and Scatliff + Miller + Murray on this Project to ensure that Metis-specific information and concerns are gathered from the Community through a full, proper, and meaningful engagement process with our Community.

Best regards,

A Kolly

pcc: Jasmine Langhan
Director of Engagement & Consultation

Cc: MMF President's Office
Marci Riel, Senior Director of Energy, Infrastructure and Resource Management
Morrissa Boerchers, Environmental Assessment Coordinator

SCATLIFF + MILLER + MURRAY

visionary urban design + landscapes

August 20, 2020

Ms. Morrissa Boerchers
Environmental Assessment Coordinator
Manitoba Metis Federation
300-150 Henry Avenue
Winnipeg, MB R3B 0J7

RE: Sun Gro Horticulture Canada Ltd.
Environment Act Proposal, Peatland Development, Evergreen 1 Bog sub-area

Dear Ms. Boerchers:

Our sincere thanks to the Manitoba Metis Federation (MMF) for the response and confirmation of receipt of Scatliff + Miller + Murray's (SMM) letter on behalf of KGS Group, regarding the Environment Act Proposal (EAP) for a Peatland Development of the Evergreen 1 Bog sub-area.

We recognize the distinctive identity of the Manitoba Metis Community with rights and interests that are protected in Section 35 of the *Constitution Act, 1982*, throughout Manitoba. I apologize for not being familiar with the MMF's Resolution No. 8. For future engagement, we will contact the MMF Home Office first, reach out to President Chartrand directly, and copy the Director of Engagement and Consultation. Thank you for informing us of your preferred process.

Currently we are undergoing proponent engagement on behalf of Sun Gro Horticulture. We are reaching out to you as part of the EAP process to be proactive and initiate engagement with the MMF. The letter you received on August 6, 2020 was intended to notify you about the project, and invite you to provide your feedback.

In the letter, I offered two opportunities for engagement in order to: facilitate a conversation, provide additional project information, identify your community's priorities, and listen to your feedback. We offer that you may select one or both of the following engagement opportunities:

1. Introductory Meeting – A virtual meeting (on Zoom) with President Chartrand, Cabinet, Regional Officers and other community members (as identified by President Chartrand and Cabinet), to identify how the community would like to be engaged, learn about key project information, and to listen to initial comments and concerns regarding the proposed development.
2. Virtual Presentation – A virtual event (on Zoom) with the community that will include a presentation by our team with relevant images and graphics to introduce the project, provide context and information about peat processing in Manitoba, and describe the potential impacts and subsequent mitigation methods of the harvesting process.

If you would like an Introductory Meeting and/or a Virtual Presentation, please let us know as soon as possible, or at the latest, by August 26, 2020.

In response to your request for information in your letter, KGS Group will be adhering to the two attached Information Bulletins that relate to licencing and preparation of an EAP. Additionally, we will submit: a Screening Request to Manitoba Sport, Culture and Heritage; Archaeological Assessment Services; and a request to the Conservation Data Centre for information on the presence of any Species at Risk in the Project Area.

I understand that the letter and project information has been forwarded to the Energy, Infrastructure, and Resources Management Department for internal review, and our project team looks forward to hearing back from the MMF regarding project-specific feedback. It would be most appreciated if this feedback could be provided to our project team by August 26, 2020 so we can incorporate it into our draft EAP.

Should you have any questions or comments, please do not hesitate to contact me at (204)-927-3444 or via email at mpauls@scatliff.ca.

Sincerely,

Meaghan Pauls, M.L.Arch.
Public Engagement Specialist

Cc: MMF President's Office
Jasmine Langhan, Director of Engagement & Consultation, MMF
Allison Kolly, Project Officer, Department of Engagement & Consultation, MMF
Marci Riel, Senior Director of Energy, Infrastructure and Resource Management, MMF
Shaun Moffatt, Senior Environmental Scientist, KGS Group
Cheryl Dixon, Public Engagement Specialist, SMM
Wes Paetkau, Senior Planner, SMM

APPENDIX E

PRESENTATON SLIDES
(RM OF BROKENHEAD / TOWN OF BEAUSEJOUR MEETING)

Environment Act Proposal

for a peatland development
at Evergreen 1 Bog sub-area

August 25, 2020

Presentation Outline

1. Our Process
2. Overview of Peatland Development
3. Who is Sun Gro Horticulture?
4. The Project
5. The Environment Assessment Process
6. Typical Environmental Issues and Mitigation Measures
7. Questions?

Our Process

- KGS Group is preparing an Environment Act Proposal (EAP) for a peatland development at Evergreen 1 Bog sub-area
- The EAP process will consider environmental effects of the project (3km radius surrounding the sub-area)
- Socio-Economic effects will be considered in the regional study area (10km radius surrounding the sub-area)
- We want to hear your comments and feedback as part of the EAP process

Fall 2020
Submit Environmental Act Proposal

2021
Obtain Environmental Act Licence

2021 - 2022
Begin site preparation, begin harvesting

2039
End of peat harvesting, begin site recovery

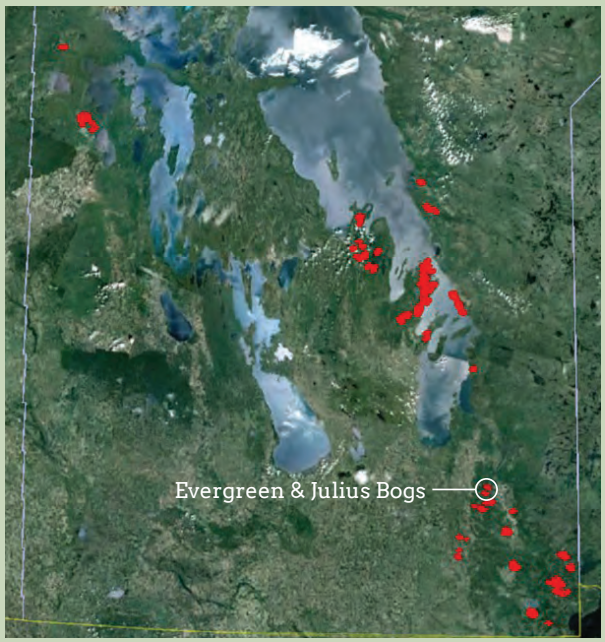
Peatlands in Canada & Manitoba

Canada

- Covers 113 million ha (25% of global supply)
- 70 million tonnes of new peat created per year
- < 0.03% has been harvested to date
- More peat is created than is harvested (60 times more)

Manitoba:

- Covers 19.2 million ha (or 17% of Canada's supply)
- Peat harvesting started in 1940 at Julius Bog
- Manitoba = 13% of national production
- See map for active peat producers



Current Manitoba Peat Harvest Licences (April 2015)

How is Peat Harvested?

1
Remove existing surface vegetation

2
Construct drainage to lower water content of peat

3
Levelling, crowning, harrowing, and drying of harvest area

4
Dried surface peat is vacuum harvested, screened, baled, packaged, and shipped

Why is Peat Harvesting Important?

Improves Growing Conditions

- regulates moisture, air, and nutrients around plant roots
- loosens heavy soils which enables proper root growth
- helps bind and retain moisture and nutrients in sandy soils

Saves Water During Growing:

Peat moss retains up to 20 times its weight in moisture and releases water slowly as seeds and plants need it.

Improves Green Spaces

Plants are nurtured by peat moss, which helps improve our environment.

Food Production

Commercial growers rely on high quality peat moss and peat based growing media to produce food.

Who is Sun Gro Horticulture?

History:

Formed in 1929, Sun Gro currently operates 22 production facilities across North America and handles thousands of tons of peat per year.

Mission:

To be an industry leader in soilless growing mixes, serving horticultural professionals, retailers, and gardeners with superior quality, branded growing mixes that yield exceptional results.

A commercial grower leader:

Sun Gro has created the highest quality, most advanced mixes, and peat products for consumers and professional growers across North America.

Values:

- maintain Canadian peatlands as an abundant renewable resource
- employ the newest research, development, and management practices to ensure peatlands remain plentiful and renewable
- only select bogs that can be restored as soon as they can after harvesting
- train local residents for jobs (82 employees in the Interlake and Southeastern MB, all from the surrounding area)

The Evergreen Sub-Area 1 Bog Project

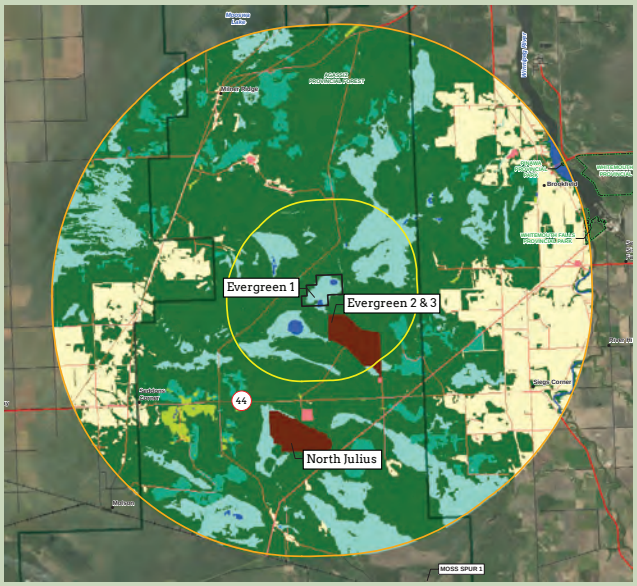
Context

Location:

- north of Hwy 44 about 8 km northeast of Seddons Corner, MB
- within an existing Sun Gro Peat Harvest Licence area
- adjacent to existing peat harvesting operations (the Evergreen 2 and 3 Sub-Areas)

Existing Conditions:

- 144 ha total, with 60 ha of peat will be harvested (due to lake and sub-area boundary buffers)
- 2 small lakes (each 200-300 m wide)



Evergreen 1 Bog Sub-area: Regional Landcover

LEGEND:

- Agriculture
- Undeveloped Upland Forest
- Bog Areas
- Water Body
- Peat Harvest Area
- Forestry Areas
- Sand and Gravel
- Built Environment

The Evergreen Sub-Area 1 Bog Project

Description

Typical development includes the following components:

- site preparation and access
- water management
- harvesting and shipping
- recovery

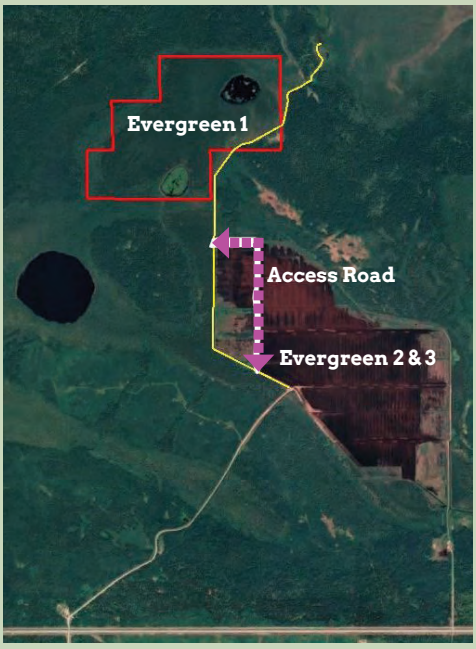
Site Preparation and Access

Site Preparation:

- 60 ha will be cleared all at the same time

Access Roads:

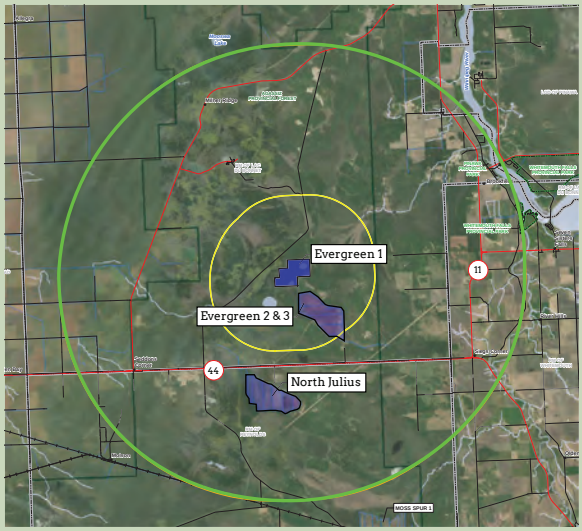
- Existing route serving Evergreen 2 and 3 Sub-Areas will be used and improved (additional gravel)
- Ditching on each side of the access road will be installed outside of bog area only
- One 30-inch culvert will be installed beneath the access route



Site Preparation and Access

Staging:

- The existing staging area at Evergreen 2 and 3 Sub-Areas will be used
- Limited equipment and trailer storage
- No fuel storage
- No groundwater wells will be installed



Water Management

Ground and surface water management requires:

- field drainage ditches
- main drainage ditches
- overland flow siltation
- buffer zones (lakes)

Harvesting and Shipping

Four phases:

- field harrowing
- harvesting (17 years of peat capacity)
- on-site stockpiling and transport to the processing plant near Elma, MB
- shipped to customers

Recovery

Process:

- Peatland Restoration Plan under the Peatland Stewardship Act
- recovery plan to replace elements lost due to peat harvesting (e.g. vegetation)
- recovery is progressive and based on research and guidelines

Environmental Assessment Process

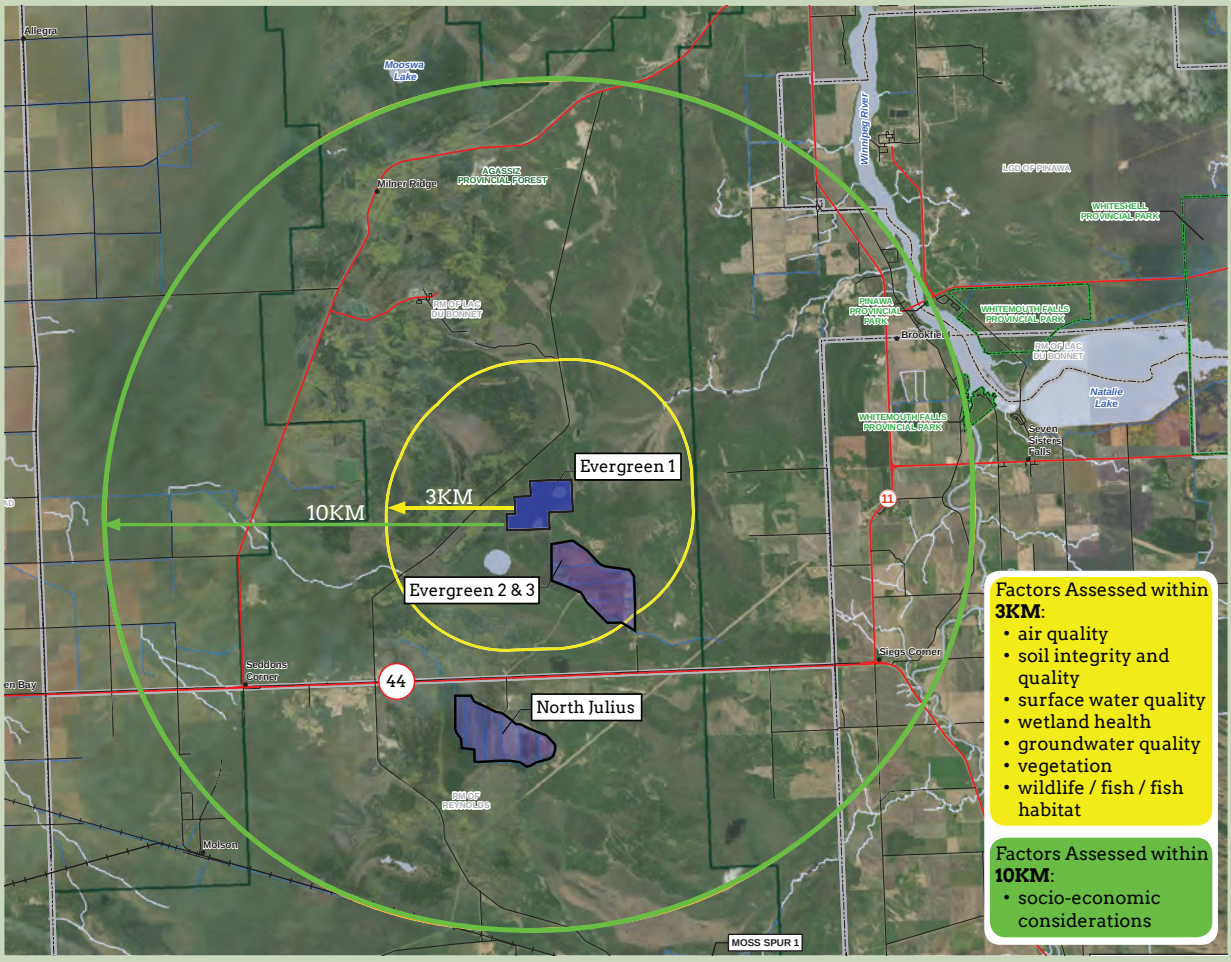
Under *The Environment Act*, an Environment Act Proposal (EAP) is required for all environmentally significant projects in MB

1 Prepare a project description:

- types and quantities of materials
- harvesting operation methods
- harvesting schedule
- site layout (drainage management)
- environmental controls (e.g. noise)
- resource usage (e.g. water)
- waste management (e.g. sewage)

2 Assess environmental factors

- air quality
- soil integrity and quality
- surface water quality
- wetland health
- groundwater quality
- vegetation
- wildlife / fish / fish habitat
- socio-economic considerations



Environmental Assessment Process (contd.)

3 **Engage the public, stakeholders and Indigenous communities:**
- letters sent by email and regular post on August 4/20

4 **Assess effects:**
- effects of the project on the environment and vice versa

5 **Identify mitigation measures:**
- to eliminate or reduce adverse project effects to acceptable levels

6 **Assess residual effects after mitigation**

7 **Prepare and file the Final EAP Report** to MCC Environmental Approvals Branch for review / approval

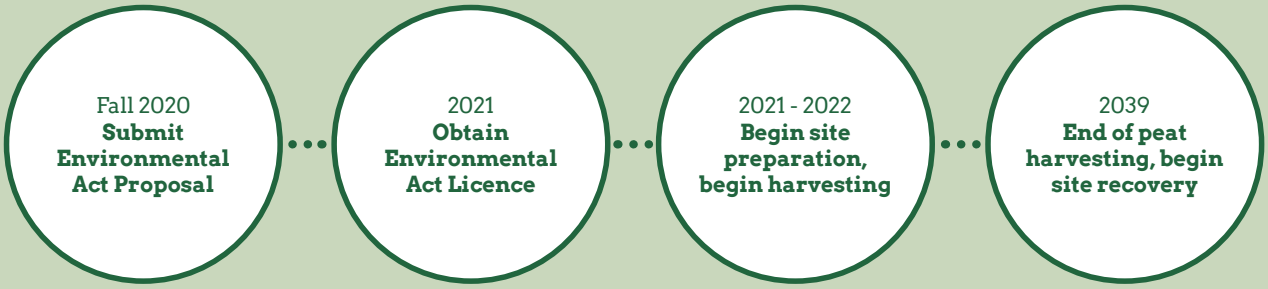
8 **Monitor the effectiveness of the mitigation measures** during project implementation

Typical Environmental Issues and Mitigation Measures

Concerns:
- Accidents
- Soil Loss
- Surface Water Contamination
- Dust Emissions
- Noise
- Drainage Changes
- Wildlife / Habitat Loss
- Loss of Wetlands / Vegetation
- CO_2 Emissions
- Public Opposition

Mitigation Measures:
- Operations-Maintenance/Emergency Manuals
- Harvested Area (60ha) < Sub-Area (144 ha)
- Project Drainage
- Peat Creation > Peat Harvesting
- Progressive Recovery Plans
- Reduce Dust (e.g. moisten stockpiles)
- Local Jobs / Economic Development

Project Timeline



Thank You

Questions?

APPENDIX F

PRESENTATON SLIDES
(MANITOBA METIS FEDERATION MEETING)

Environment Act Proposal

for a peatland development
at Evergreen 1 Bog sub-area

September 8, 2020

Presentation Outline

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3. Who is Sun Gro Horticulture?
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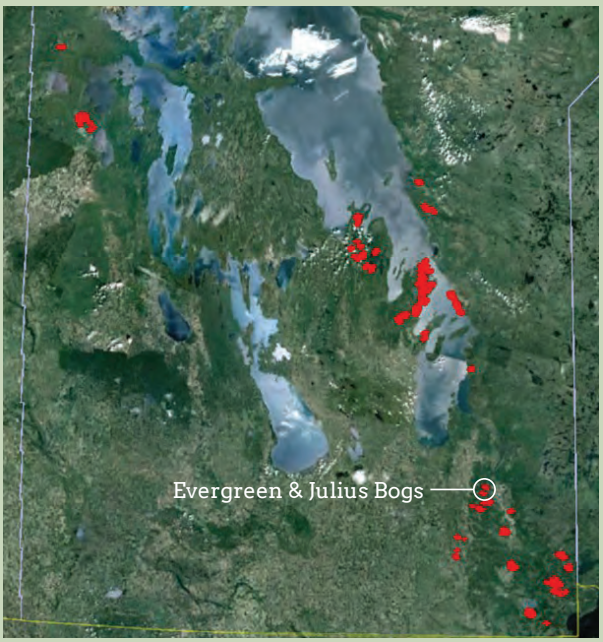

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- loosens heavy soils which enables proper root growth
- helps bind and retain moisture and nutrients in sandy soils

Saves Water During Growing:

Peat moss retains up to 20 times its weight in moisture and releases water slowly as seeds and plants need it.

Improves Green Spaces

Plants are nurtured by peat moss, which helps improve our environment.

Food Production

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Sun Gro has created the highest quality, most advanced mixes, and peat products for consumers and professional growers across North America.

Sun Gro's Values

Environment:

- maintain Canadian peatlands as an abundant renewable resource
- employ the newest research, development, and management practices to ensure peatlands remain plentiful and renewable
- only select bogs that can be restored as soon as they can after harvesting

Local Communities:

- committed to training and hiring local residents for jobs that are safe and pay a fair wage (82 employees in the Interlake and Southeastern Manitoba are all from the surrounding area).

Sharing Knowledge:

- Sun Gro finds ways to improve business for the benefit of all by learning from others and sharing knowledge

Long-Term Thinking:

- frames our decision-making to help secure a brighter future

The Evergreen Sub-Area 1 Bog Project

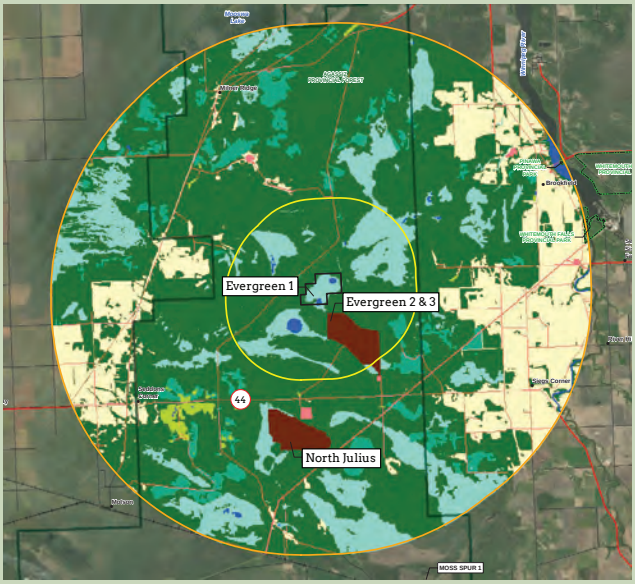
Context

Location:

- north of Hwy 44 about 8 km northeast of Seddons Corner, MB
- within an existing Sun Gro Peat Harvest Licence area
- adjacent to existing peat harvesting operations (the Evergreen 2 and 3 Sub-Areas)

Existing Conditions:

- 144 ha total, with 60 ha of peat will be harvested (due to lake and sub-area boundary buffers)
- 2 small lakes (each 200-300 m wide)



Evergreen 1 Bog Sub-area: Regional Landcover

LEGEND:

- Agriculture
- Undeveloped Upland Forest
- Bog Areas
- Water Body
- Peat Harvest Area
- Forestry Areas
- Sand and Gravel
- Built Environment

The Evergreen Sub-Area 1 Bog Project

Description

Typical development includes the following components:

- site preparation and access
- water management
- harvesting and shipping
- recovery

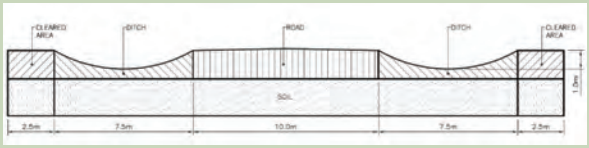
Site Preparation and Access

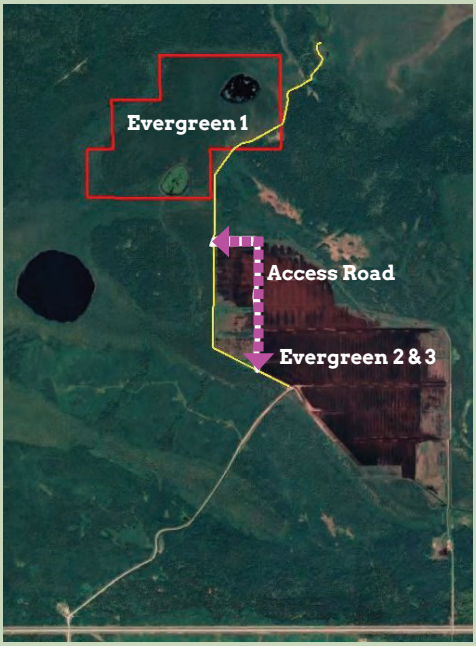
Site Preparation:

- 60 ha will be cleared all at the same time

Access Roads:

- Existing route serving Evergreen 2 and 3 Sub-Areas will be used and improved (additional gravel)
- Ditching on each side of the access road will be installed outside of bog area only
- One 30-inch culvert will be installed beneath the access route

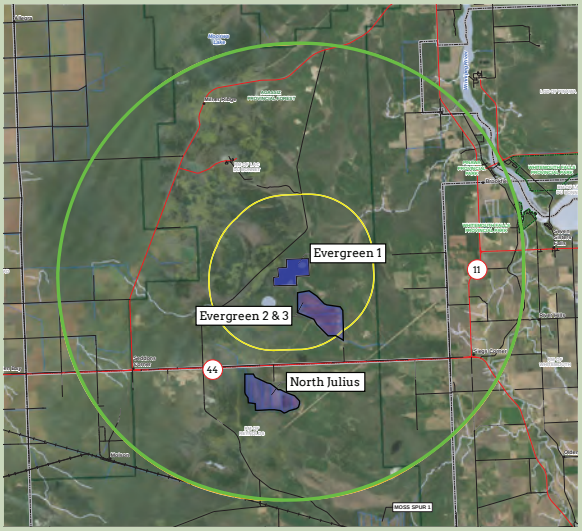




Site Preparation and Access

Staging:

- The existing staging area at Evergreen 2 and 3 Sub-Areas will be used
- Limited equipment and trailer storage
- No fuel storage
- No groundwater wells will be installed



Water Management

Ground and surface water management requires:

- field drainage ditches
- main drainage ditches
- overland flow siltation
- buffer zones (lakes)

Harvesting and Shipping

Four phases:

- field harrowing
- harvesting (17 years of peat capacity)
- on-site stockpiling and transport to the processing plant near Elma, MB
- shipped to customers

Recovery

Process:

- Peatland Restoration Plan under the Peatland Stewardship Act
- recovery plan to replace elements lost due to peat harvesting (e.g. vegetation)
- recovery is progressive and based on research and guidelines

Environmental Assessment Process

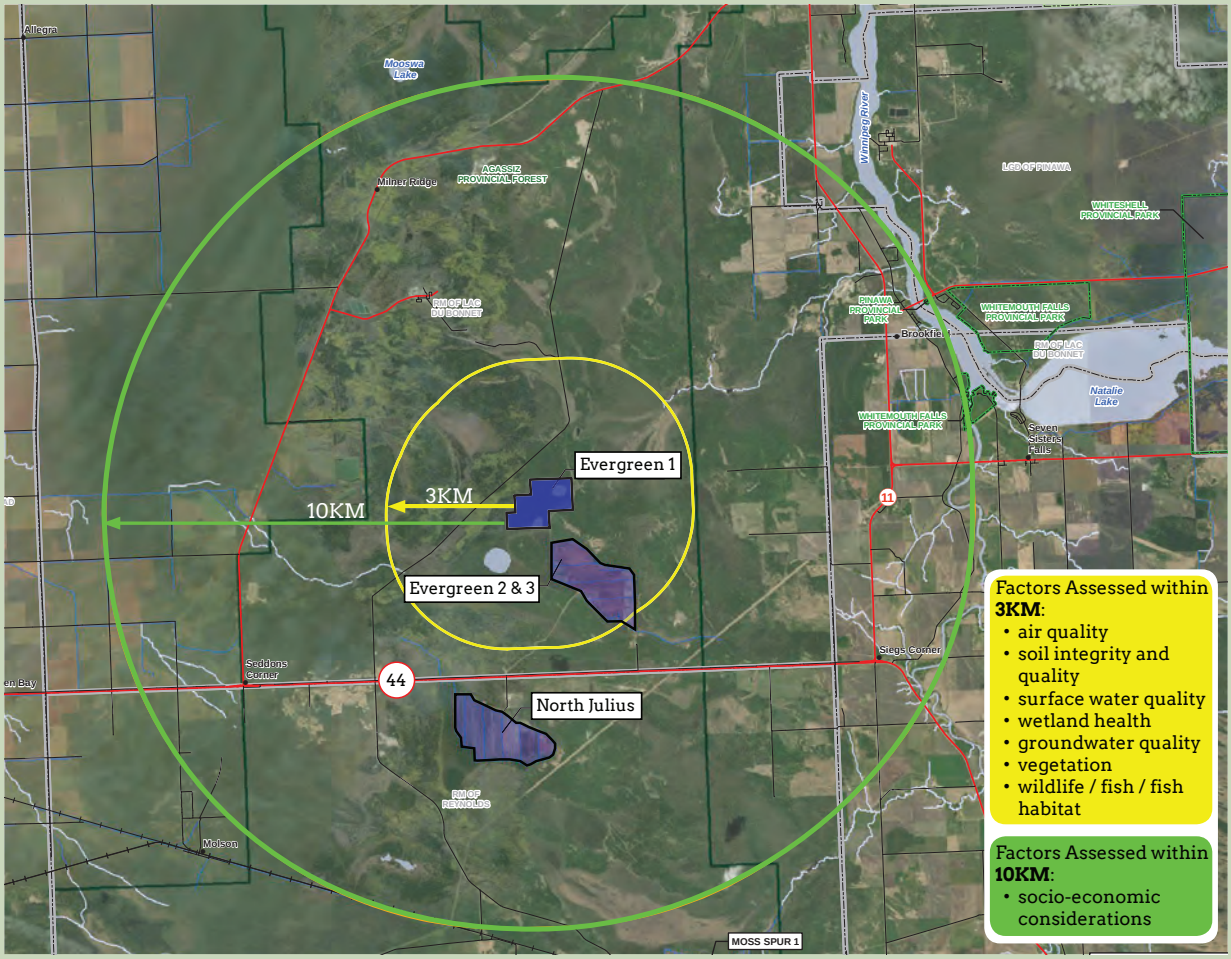
Under *The Environment Act*, an Environment Act Proposal (EAP) is required for all environmentally significant projects in MB

1 Prepare a project description:

- types and quantities of materials
- harvesting operation methods
- harvesting schedule
- site layout (drainage management)
- environmental controls (e.g. noise)
- resource usage (e.g. water)
- waste management (e.g. sewage)

2 Assess environmental factors

- air quality
- soil integrity and quality
- surface water quality
- wetland health
- groundwater quality
- vegetation
- wildlife / fish / fish habitat
- socio-economic considerations



Environmental Assessment Process (contd.)

3 **Engage the public, stakeholders and Indigenous communities:**
- letters sent by email and regular post on August 4/20

4 **Assess effects:**
- effects of the project on the environment and vice versa

5 **Identify mitigation measures:**
- to eliminate or reduce adverse project effects to acceptable levels

6 **Assess residual effects after mitigation**

7 **Prepare and file the Final EAP Report** to MCC Environmental Approvals Branch for review / approval

8 **Monitor the effectiveness of the mitigation measures** during project implementation

Typical Environmental Issues and Mitigation Measures

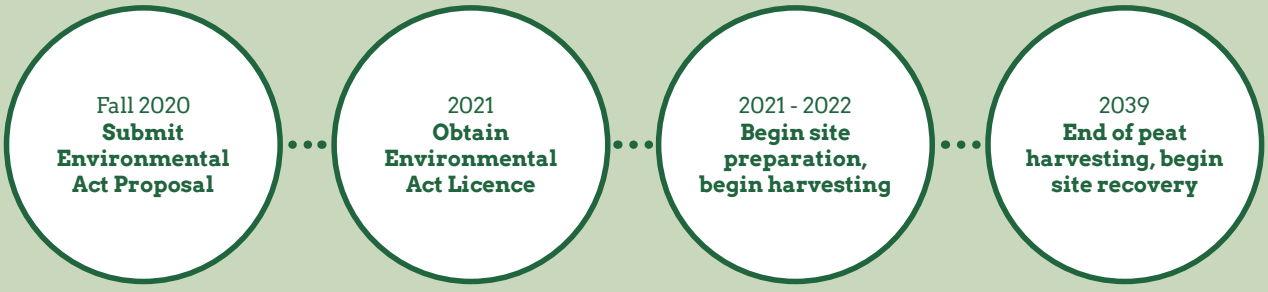
Concerns:

- Accidents
- Soil Loss
- Surface Water Contamination
- Dust Emissions
- Noise
- Drainage Changes
- Wildlife / Habitat Loss
- Loss of Wetlands / Vegetation
- CO_2 Emissions
- Public Opposition

Mitigation Measures:

- Operations-Maintenance/Emergency Manuals
- Harvested Area (60ha) < Sub-Area (144 ha)
- Project Drainage
- Peat Creation > Peat Harvesting
- Progressive Recovery Plans
- Reduce Dust (e.g. moisten stockpiles)
- Local Jobs / Economic Development

Project Timeline



Thank You

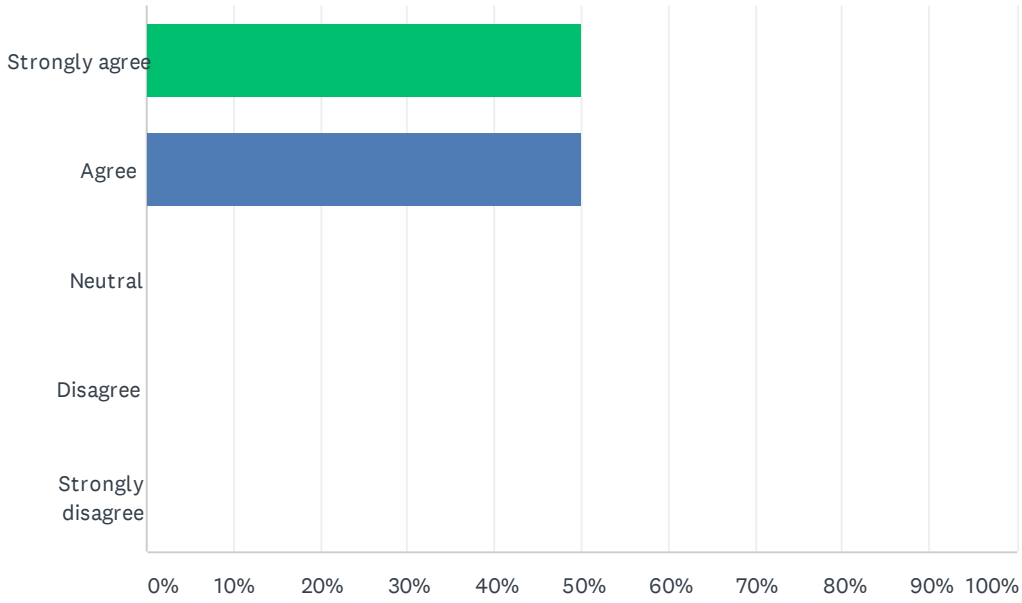
Questions?

APPENDIX G

ONLINE SURVEY

Q1 Was the information presented during the virtual meeting helpful to understanding the Evergreen 1 Bog Project?

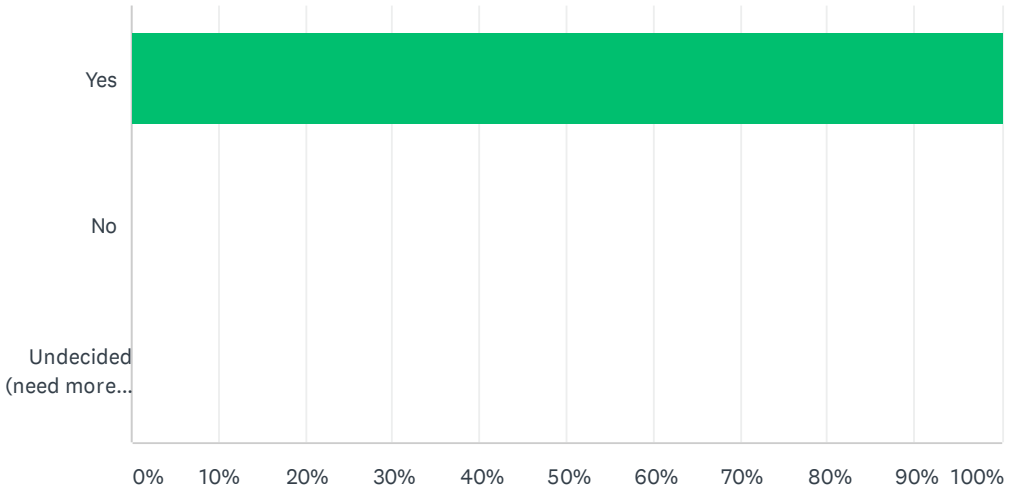
Answered: 2 Skipped: 0



ANSWER CHOICES	RESPONSES	
Strongly agree	50.00%	1
Agree	50.00%	1
Neutral	0.00%	0
Disagree	0.00%	0
Strongly disagree	0.00%	0
TOTAL		2

Q2 If you had any concerns about the Evergreen 1 Bog Project, did the information presented help to address them?

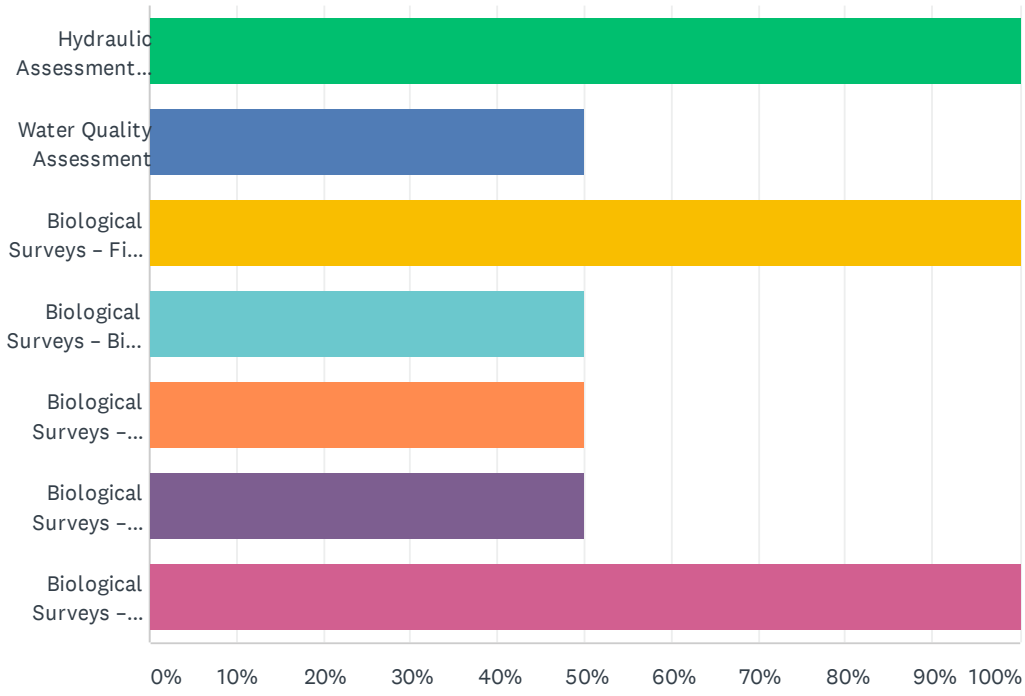
Answered: 2 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	100.00%	2
No	0.00%	0
Undecided (need more information)	0.00%	0
TOTAL		2

Q3 Which assessments that KGS Group will undertake interest you the most? (Select all that apply)

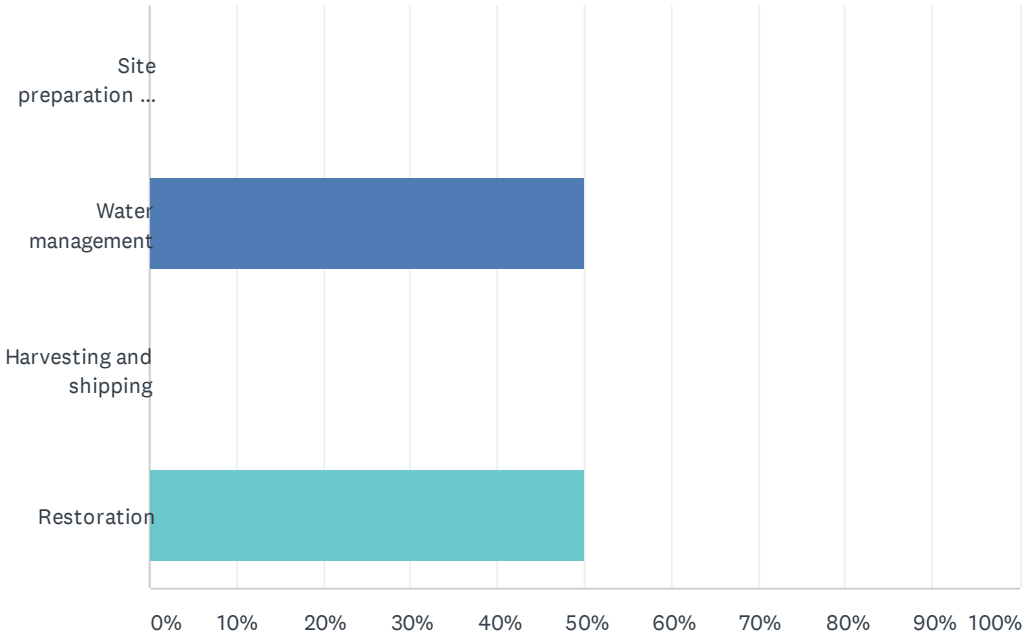
Answered: 2 Skipped: 0



ANSWER CHOICES	RESPONSES	
Hydraulic Assessment (surface water flow and drainage)	100.00%	2
Water Quality Assessment	50.00%	1
Biological Surveys – Fish Habitat	100.00%	2
Biological Surveys – Bird Habitat	50.00%	1
Biological Surveys – Mammal Habitat	50.00%	1
Biological Surveys – Amphibian and Reptile Habitat	50.00%	1
Biological Surveys – Vegetation and Plant Communities	100.00%	2
Total Respondents: 2		

Q4 What aspects of the project interest you the most? (Select all that apply)

Answered: 2 Skipped: 0



ANSWER CHOICES	RESPONSES	
Site preparation and access	0.00%	0
Water management	50.00%	1
Harvesting and shipping	0.00%	0
Restoration	50.00%	1
Total Respondents: 2		

Q5 Please provide any other comments you may have regarding this project.

Answered: 0 Skipped: 2

Q6 What are the first 3 digits of your postal code?

Answered: 2 Skipped: 0

1. R0E
2. R0E

APPENDIX D

Manitoba Conservation Data Centre Species of Conservation Concern within the Lakes of the Woods Ecoregion

Conservation and Climate

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Filter By Cateogory: Plant

Filter By Ecoregion: Lake of the Woods

Ecoregions

Show All entries Search:

Ecoregion	Category	Scientific Name	Common Name	S Rank
Lake of the Woods	Plant	Adlumia fungosa	Climbing Fumitory	SH
Lake of the Woods	Plant	Agalinis tenuifolia	Narrow-leaved Agalinis	S2S3
Lake of the Woods	Plant	Amorpha fruticosa	False Indigo	S1S2
Lake of the Woods	Plant	Anemone americana	Liverleaf	S1
Lake of the Woods	Plant	Antennaria plantaginifolia	Plantain-leaved Everlasting	S1S2
Lake of the Woods	Plant	Arabidopsis arenicola	Arctic Rock Cress	S2S3
Lake of the Woods	Plant	Arethusa bulbosa	Dragon's-mouth	S2
Lake of the Woods	Plant	Arisaema triphyllum ssp. triphyllum	Jack-in-the-pulpit	S1S2
Lake of the Woods	Plant	Bidens beckii	Water-marigold	S3
Lake of the Woods	Plant	Botrychium simplex	Least Grapefern	S1
Lake of the Woods	Plant	Brasenia schreberi	Water-shield	S1S2

Ecoregion	Category	Scientific Name	Common Name	S Rank
Lake of the Woods	Plant	Bromus porteri	Porter's Chess	S2S3
Lake of the Woods	Plant	Calopogon tuberosus	Swamp-pink	S2
Lake of the Woods	Plant	Calystegia spithamaea	Low Bindweed	SH
Lake of the Woods	Plant	Canadanthus modestus	Large Northern Aster	S2
Lake of the Woods	Plant	Carex arctata	Black Sedge	S1
Lake of the Woods	Plant	Carex castanea	Chestnut Sedge	S2S3
Lake of the Woods	Plant	Carex crinita	Long-haired Sedge	S1
Lake of the Woods	Plant	Carex douglasii	Douglas Sedge	S2
Lake of the Woods	Plant	Carex emoryi	Emory's Sedge	S2?
Lake of the Woods	Plant	Carex gracillima	Slender Sedge	S2S3
Lake of the Woods	Plant	Carex intumescens	Swollen Sedge	S3
Lake of the Woods	Plant	Carex livida	Livid Sedge	S3
Lake of the Woods	Plant	Carex merritt-fernaldii	Merritt Fernald's Sedge	S1
Lake of the Woods	Plant	Carex pauciflora	Few-flowered Sedge	S3
Lake of the Woods	Plant	Carex pedunculata	Stalked Sedge	S3
Lake of the Woods	Plant	Carex projecta	Necklace Sedge	S3?
Lake of the Woods	Plant	Carex tetanica	Rigid Sedge	S3
Lake of the Woods	Plant	Carex vulpinoidea	Fox Sedge	S3
Lake of the Woods	Plant	Caulophyllum thalictroides	Papoose-root	S2
Lake of the Woods	Plant	Ceanothus herbaceus	New Jersey Tea	S2S3

Ecoregion	Category	Scientific Name	Common Name	S Rank
Lake of the Woods	Plant	Chelone glabra	Turtlehead	S2
Lake of the Woods	Plant	Circaea canadensis ssp. canadensis	Large Enchanter's-nightshade	S2
Lake of the Woods	Plant	Cladium mariscoides	Twig Rush	S2S3
Lake of the Woods	Plant	Collinsia parviflora	Blue-eyed Mary	S1
Lake of the Woods	Plant	Corispermum americanum var. americanum	American Bugseed	S3
Lake of the Woods	Plant	Corispermum villosum	Hairy Bugseed	S1S2
Lake of the Woods	Plant	Cornus alternifolia	Alternate-leaved Dogwood	S3
Lake of the Woods	Plant	Cyperus houghtonii	Houghton's Umbrella-sedge	S2S3
Lake of the Woods	Plant	Cyperus schweinitzii	Schweinitz's Flatsedge	S2
Lake of the Woods	Plant	Cypripedium arietinum	Ram's Head Lady's-slipper	S2S3
Lake of the Woods	Plant	Descurainia sophioides	Northern Flixweed	S2
Lake of the Woods	Plant	Dicentra cucullaria	Dutchman's-breeches	S1
Lake of the Woods	Plant	Diphasiastrum tristachyum	Ground-cedar	S3
Lake of the Woods	Plant	Drosera linearis	Slender-leaved Sundew	S2?
Lake of the Woods	Plant	Dulichium arundinaceum	Three-way Sedge	S2
Lake of the Woods	Plant	Eleocharis obtusa	Blunt Spike-rush	S1
Lake of the Woods	Plant	Elymus hystrix	Bottle-brush Grass	S2
Lake of the Woods	Plant	Elymus lanceolatus	Northern Wheat Grass	S3
Lake of the Woods	Plant	Elymus lanceolatus ssp. lanceolatus	Thickspike Wheatgrass	S3

Ecoregion	Category	Scientific Name	Common Name	S Rank
Lake of the Woods	Plant	Epigaea repens	Mayflower	S3
Lake of the Woods	Plant	Eriocaulon aquaticum	White-buttons	S1
Lake of the Woods	Plant	Eriophorum scheuchzeri	Scheuchzeri's Cotton-grass	S2?
Lake of the Woods	Plant	Eurybia macrophylla	White Wood Aster	S1
Lake of the Woods	Plant	Fraxinus nigra	Black Ash	S2S3
Lake of the Woods	Plant	Galium aparine	Cleavers	S3
Lake of the Woods	Plant	Gentiana rubricaulis	Closed Gentian	S3
Lake of the Woods	Plant	Glyceria canadensis	Canada Manna Grass	S1
Lake of the Woods	Plant	Goodyera tesselata	Tesselated Rattlesnake Plantain	S2
Lake of the Woods	Plant	Helianthus nuttallii ssp. rydbergii	Tuberous-rooted Sunflower	S2
Lake of the Woods	Plant	Hesperostipa curtiseta	Western Porcupine Grass	S3
Lake of the Woods	Plant	Heteranthera dubia	Water Star-grass	S2S3
Lake of the Woods	Plant	Hudsonia tomentosa	False Heather	S3
Lake of the Woods	Plant	Huperzia lucidula	Shining Club-moss	SH
Lake of the Woods	Plant	Huperzia selago	Mountain Club-moss	S2S3
Lake of the Woods	Plant	Juncus interior	Inland Rush	S1
Lake of the Woods	Plant	Krigia biflora	Two-flowered Dwarf-dandelion	S2S3
Lake of the Woods	Plant	Lechea intermedia	Pinweed	S1?
Lake of the Woods	Plant	Leersia oryzoides	Rice Cutgrass	S3

Ecoregion	Category	Scientific Name	Common Name	S Rank
Lake of the Woods	Plant	Lonicera canadensis	American Fly-honeysuckle	S1
Lake of the Woods	Plant	Maianthemum racemosum	False Spikenard	S1
Lake of the Woods	Plant	Maianthemum racemosum ssp. racemosum	False Spikenard	S1
Lake of the Woods	Plant	Malaxis monophyllos	White Adder's-mouth	S2?
Lake of the Woods	Plant	Malaxis unifolia	Green Adder's-mouth	S2?
Lake of the Woods	Plant	Menispermum canadense	Canada Moonseed	S3
Lake of the Woods	Plant	Micranthes pensylvanica	Swamp Saxifrage	S1
Lake of the Woods	Plant	Myriophyllum alterniflorum	Water-milfoil	S1S3
Lake of the Woods	Plant	Myriophyllum farwellii	Farwell's Water-milfoil	S1
Lake of the Woods	Plant	Nymphaea odorata	Fragrant Water-lily	S2?
Lake of the Woods	Plant	Nymphaea odorata ssp. odorata	Fragrant Water-lily	S2
Lake of the Woods	Plant	Nymphaea odorata ssp. tuberosa	Tubreous White Water-lily	S1
Lake of the Woods	Plant	Nymphaea tetragona	Small Water-lily	S2?
Lake of the Woods	Plant	Onoclea sensibilis	Sensitive Fern	S3?
Lake of the Woods	Plant	Ophioglossum pusillum	Northern Adder's-tongue	S1
Lake of the Woods	Plant	Osmorhiza claytonii	Hairy Sweet Cicely	S2?
Lake of the Woods	Plant	Osmunda claytoniana	Interrupted Fern	S2S3
Lake of the Woods	Plant	Ostrya virginiana	Hop-hornbeam	S2
Lake of the Woods	Plant	Pellaea glabella ssp. glabella	Smooth Cliffbrake	S1?
Lake of the Woods	Plant	Persicaria sagittata	Arrow-leaved Tear-thumb	S3

Ecoregion	Category	Scientific Name	Common Name	S Rank
Lake of the Woods	Plant	Pinus resinosa	Red Pine	S2S3
Lake of the Woods	Plant	Pinus strobus	Eastern White Pine	S2
Lake of the Woods	Plant	Platanthera hookeri	Hooker's Orchid	S2S3
Lake of the Woods	Plant	Platanthera lacera	Fringed Orchid	S1S2
Lake of the Woods	Plant	Platanthera psycodes	Small Purple-fringed Orchid	S1
Lake of the Woods	Plant	Pogonia ophioglossoides	Rose Pogonia	S1
Lake of the Woods	Plant	Populus grandidentata	Large-tooth Aspen	S1S2
Lake of the Woods	Plant	Potamogeton amplifolius	Large-leaved Pondweed	S3
Lake of the Woods	Plant	Potamogeton illinoensis	Illinois Pondweed	S1?
Lake of the Woods	Plant	Potamogeton robbinsii	Robbin's Pondweed	S2S3
Lake of the Woods	Plant	Potamogeton spirillus	Fennel-leaved Pondweed	S1
Lake of the Woods	Plant	Pyrola americana	Round-leaved Pyrola	S2?
Lake of the Woods	Plant	Ranunculus fascicularis	Early Buttercup	S1
Lake of the Woods	Plant	Ranunculus hispidus var. caricetorum	Bristly Buttercup	S2
Lake of the Woods	Plant	Rhynchospora alba	White Beakrush	S3
Lake of the Woods	Plant	Rhynchospora capillacea	Horned Beakrush	S2S3
Lake of the Woods	Plant	Sagittaria rigida	Sessile-fruited Arrowhead	S2?
Lake of the Woods	Plant	Sanguinaria canadensis	Blood-root	S2
Lake of the Woods	Plant	Sceptridium multifidum	Leathery Grape-fern	S3
Lake of the Woods	Plant	Sceptridium oneidense	Blunt-lobed Moonwort	S1

Ecoregion	Category	Scientific Name	Common Name	S Rank
Lake of the Woods	Plant	Scutellaria parvula var. missouriensis	Small Skullcap	S1?
Lake of the Woods	Plant	Sisyrinchium campestre	White-eyed Grass	S3
Lake of the Woods	Plant	Solidago juncea	Sharp-toothed Goldenrod	S1S2
Lake of the Woods	Plant	Solidago uliginosa	Bog Goldenrod	S3
Lake of the Woods	Plant	Sparganium glomeratum	Clustered Burreed	S1S2
Lake of the Woods	Plant	Spiranthes magnicamporum	Great Plains Ladies'-tresses	S1S2
Lake of the Woods	Plant	Streptopus amplexifolius	Clasping Twisted-stalk	S2?
Lake of the Woods	Plant	Symphyotrichum sericeum	Western Silvery Aster	S2S3
Lake of the Woods	Plant	Taxus canadensis	Canada Yew	S3
Lake of the Woods	Plant	Thermopsis rhombifolia	Golden Bean	S2S3
Lake of the Woods	Plant	Torreyochloa pallida var. fernaldii	Pale Manna Grass	S2
Lake of the Woods	Plant	Uvularia sessilifolia	Small Bellwort	S2
Lake of the Woods	Plant	Vaccinium caespitosum	Dwarf Bilberry	S3
Lake of the Woods	Plant	Viola labradorica	Early Blue Violet	S3
Lake of the Woods	Plant	Viola selkirkii	Long-spurred Violet	S2
Lake of the Woods	Plant	Woodsia alpina	Northern Woodsia	S2
Lake of the Woods	Plant	Woodsia glabella	Smooth Woodsia	S2

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Ecoregions

Show All entries Search:

Ecoregion	Category	Scientific Name	Common Name	S Rank
Lake of the Woods	Mammal	Condylura cristata	Star-nosed Mole	S3

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Filter By Ecoregion: Lake of the Woods

Ecoregions

Show All entries Search:

Ecoregion	Category	Scientific Name	Common Name	S Rank
Lake of the Woods	Bird	Aechmophorus occidentalis	Western Grebe	S4B
Lake of the Woods	Bird	Ammodramus bairdii	Baird's Sparrow	S1B
Lake of the Woods	Bird	Ammodramus savannarum	Grasshopper Sparrow	S3B
Lake of the Woods	Bird	Antrostomus vociferus	Whip-poor-will	S3B
Lake of the Woods	Bird	Ardea herodias	Great Blue Heron	S5B
Lake of the Woods	Bird	Asio flammeus	Short-eared Owl	S2S3B
Lake of the Woods	Bird	Cardellina canadensis	Canada Warbler	S3B
Lake of the Woods	Bird	Chaetura pelagica	Chimney Swift	S2B
Lake of the Woods	Bird	Charadrius melodus	Piping Plover	S1B
Lake of the Woods	Bird	Chordeiles minor	Common Nighthawk	S3B
Lake of the Woods	Bird	Contopus cooperi	Olive-sided Flycatcher	S3B

Ecoregion	Category	Scientific Name	Common Name	S Rank
Lake of the Woods	Bird	Contopus virens	Eastern Wood-pewee	S4B
Lake of the Woods	Bird	Coturnicops noveboracensis	Yellow Rail	S3B
Lake of the Woods	Bird	Cygnus buccinator	Trumpeter Swan	S1B
Lake of the Woods	Bird	Dolichonyx oryzivorus	Bobolink	S4B
Lake of the Woods	Bird	Hirundo rustica	Barn Swallow	S4B
Lake of the Woods	Bird	Ixobrychus exilis	Least Bittern	S2B
Lake of the Woods	Bird	Larus argentatus	Herring Gull	S4B
Lake of the Woods	Bird	Melanerpes erythrocephalus	Red-headed Woodpecker	S3B
Lake of the Woods	Bird	Phalacrocorax auritus	Double-crested Cormorant	S5B
Lake of the Woods	Bird	Riparia riparia	Bank Swallow	S5B
Lake of the Woods	Bird	Setophaga pinus	Pine Warbler	S3B
Lake of the Woods	Bird	Sterna hirundo	Common Tern	S5B
Lake of the Woods	Bird	Strix nebulosa	Great Gray Owl	S4
Lake of the Woods	Bird	Vermivora chrysoptera	Golden-winged Warbler	S3B

Showing 1 to 25 of 25 entries (filtered from 1,304 total entries)

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Filter By Cateogory: Fish

Filter By Ecoregion: Lake of the Woods

Ecoregions

Show 20 entries Search:

Ecoregion	Category	Scientific Name	Common Name	S Rank
Lake of the Woods	Fish	Coregonus zenithicus	Shortjaw Cisco	S2
Lake of the Woods	Fish	Fundulus diaphanus	Banded Killifish	S2
Lake of the Woods	Fish	Notropis percobromus	Carmine Shiner	S2

Showing 1 to 3 of 3 entries (filtered from 1,304 total entries)

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Filter By Cateogory: Amphibian

Filter By Ecoregion: Lake of the Woods

Ecoregions

Show All entries Search:

Ecoregion	Category	Scientific Name	Common Name	S Rank
Lake of the Woods	Amphibian	Ambystoma tigrinum	Eastern Tiger Salamander	S2?
Lake of the Woods	Amphibian	Lithobates clamitans	Green Frog	S1S2
Lake of the Woods	Amphibian	Lithobates pipiens	Northern Leopard Frog	S4
Lake of the Woods	Amphibian	Lithobates septentrionalis	Mink Frog	S3

Showing 1 to 4 of 4 entries (filtered from 1,304 total entries)

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APPENDIX E

Government Correspondence

Dan Leitch

From: Murray, Colin (ARD) <Colin.Murray@gov.mb.ca>
Sent: June-19-20 5:10 PM
To: Dan Leitch
Subject: DR D Leitch KGS 20200624 Sun Gro Evergreen 1 EAL
Attachments: DR D Leitch KGS 20200624 Sun Gro Evergreen 1 EAL.xlsx

Hi Dan
Thank you for your information request. I completed a search of the Manitoba Conservation Data Centre's (CDC) rare species database for the area of interest described in the request and KMZ file you provided. This includes the primary location; and a 2km radius buffer from the footprint boundary. I note that I found the centroid point you provided of the site to be along the southeast edge of the boundary (see reference screen clip).

I am attaching a Microsoft Excel spreadsheet summarizing these occurrences. The spreadsheet includes scientific and common names, the provincial (SRank) rank for each species as well as the Manitoba Endangered Species and Ecosystem Act, and the federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and Species at Risk Act (SARA) designations.

Further information on this ranking system can be found on our website at: http://www.natureserve.org/conservation-tools/conservation-status-assessment.
These designations can be found at:
http://web2.gov.mb.ca/laws/statutes/ccsm/e111e.php,
https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html and
http://www.sararegistry.gc.ca/default.asp?lang=En&n=24F7211B-1.

Manitoba's recommended setback distances can be found at:
https://www.gov.mb.ca/sd/pubs/conservation-data-centre/mbcdc_bird_setbacks.pdf.

The information provided in this letter is based on existing data known to the Manitoba Conservation Data Centre of the Wildlife and Fisheries Branch 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 does not confirm the absence of any rare or endangered species. Many areas of the province have never been thoroughly surveyed, therefore, the absence of data in any particular geographic area does not necessarily mean that species or ecological communities of concern are not present. The information should not be regarded as a final statement on the occurrence of any species of concern, nor should it substitute for on-site surveys for species or environmental assessments. Also, because our 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 passes before it is utilized.

Third party requests for products wholly or partially derived from our Biotics database 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 data from our database, as the Manitoba Conservation Data Centre; Wildlife and Fisheries Branch, Manitoba Sustainable Development.

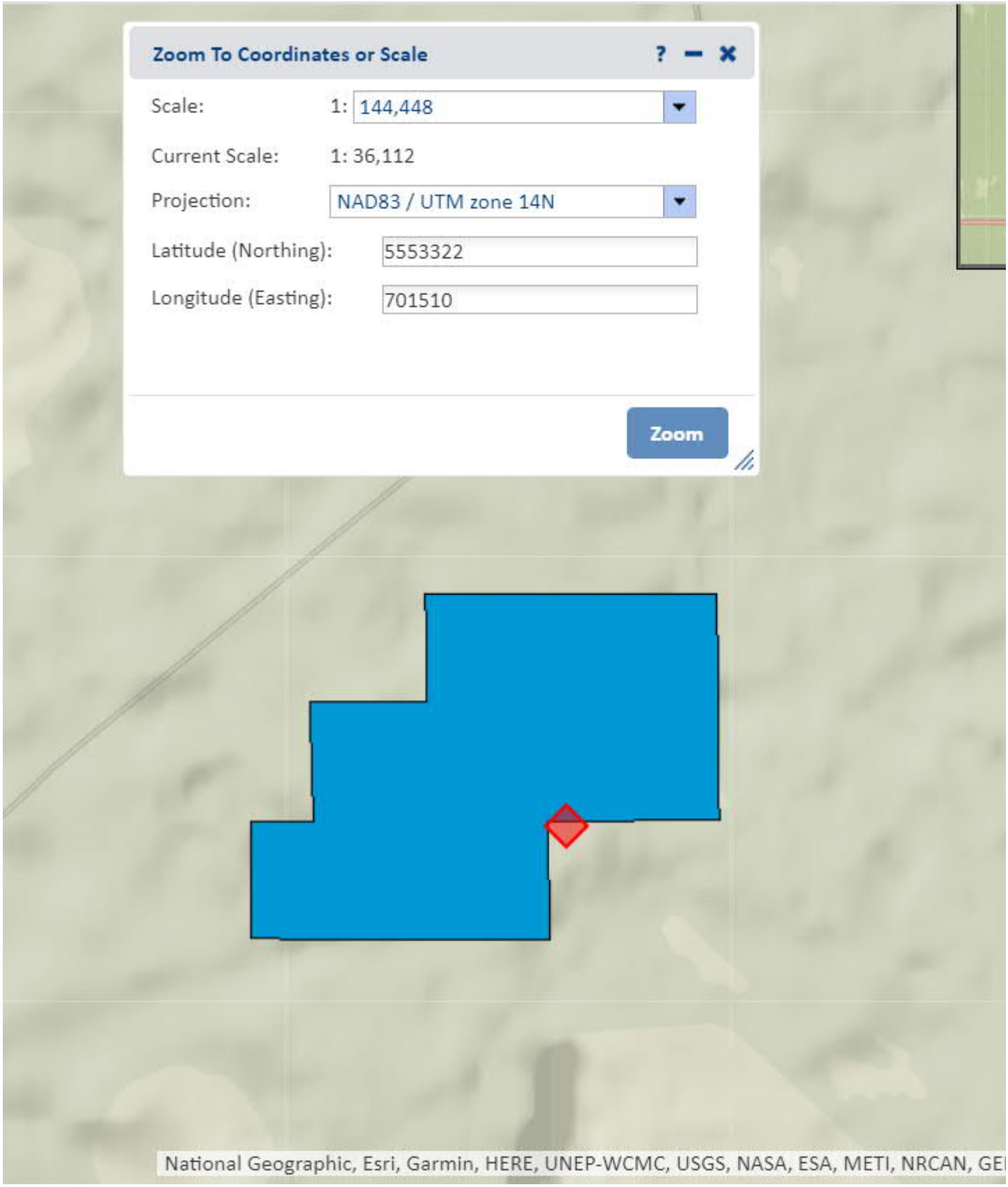
This letter is for information purposes only - it does not constitute consent or approval of the proposed project or activity, nor does it negate the need for any permits or approvals required by the Province of Manitoba.

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.

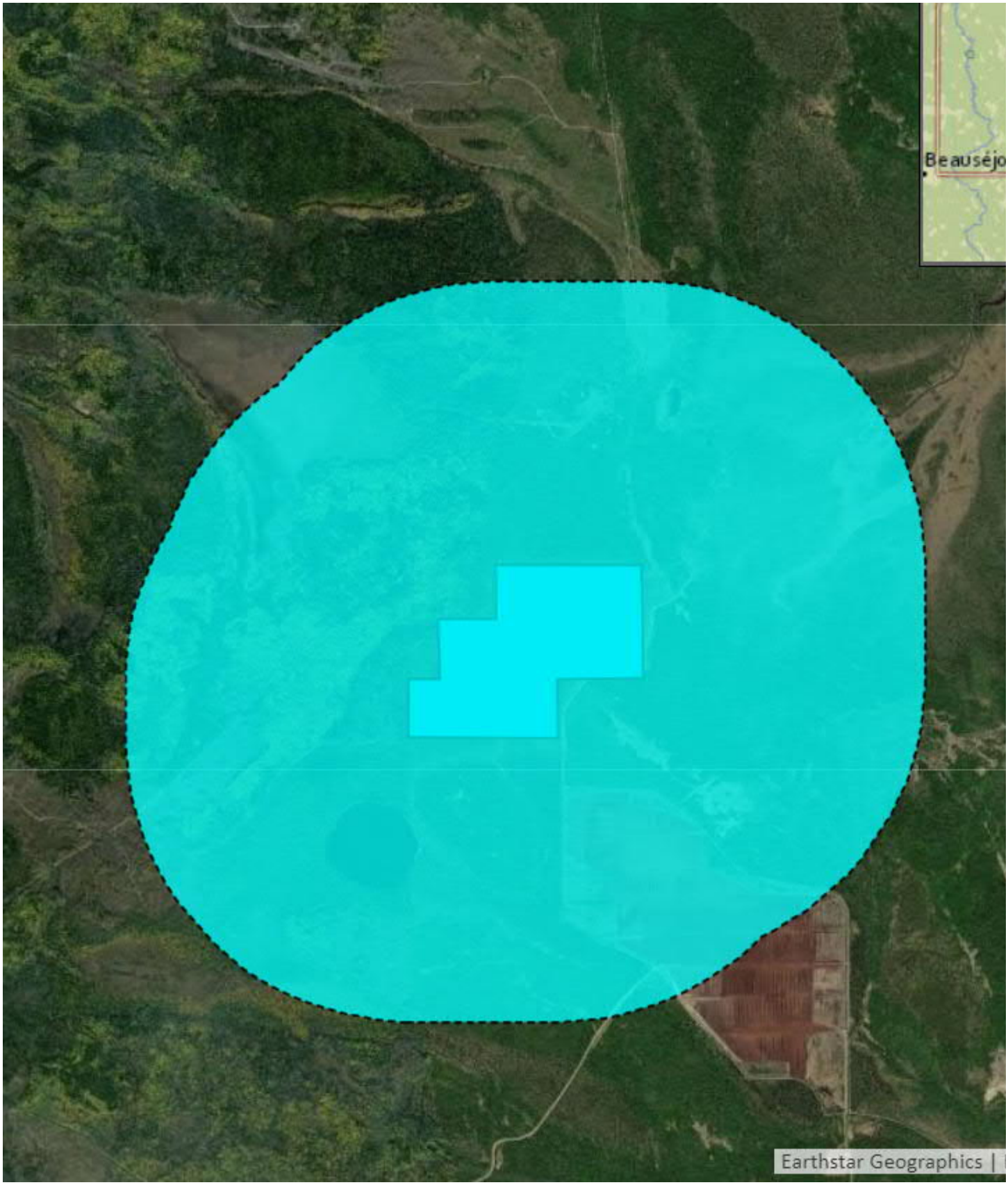
If you have any questions or require further information contact me directly at (204) 945-7760.

Colin

Reference screen clip:



Site with 2km radius buffer:


Beauséjo
Earthstar Geographics |

Colin Murray
Information Manager
Manitoba Conservation Data Centre
Wildlife and Fisheries Branch
Agriculture and Resource Development

200 Saulteaux Crescent
Winnipeg, Manitoba, R3J3W3
204-945-7760
colin.Murray@gov.mb.ca
http://www.gov.mb.ca/sd/cdc/index.html

-----Original Message-----
From: +WPG969 - Form Submissions (FIN) <noreply@gov.mb.ca>
Sent: June 9, 2020 9:01 PM
To: Murray, Colin (ARD) <Colin.Murray@gov.mb.ca>
Subject: WWW Form Submission

Below is the result of your feedback form. It was submitted by CDC Information Request () on Tuesday, June 9, 2020 at 21:00:48

DocumentID: Manitoba_Sustainable_Development

Project Title: Sun Gro - Evergreen 1 Bog Environment Act Licence

Date Needed: 2020/06/24

Name: Dan Leitch

Company/Organization: KGS Group

Address: 865 Waverley St.

City: Winnipeg

Province/State: Manitoba

Phone: 2048961209

Email: dleitch@kgsgroup.com

Project Description: Sun Gro Horticulture is proposing to harvest peat from the Evergreen 1 sub-area within their existing Peat Harvest Licence (PHL) #3. An Environment Act Proposal (EAP) is currently being prepared. As part of the EAP, baseline environmental conditions environmental conditions will be assessed. Records of the presence of rare and protected species will help inform the effects assessment and ensure appropriate mitigation measures are proposed. The Evergreen 1 sub-area is 143 ha and is situated immediately north-west of the existing Evergreen 2 and 3 harvest areas.

Information Requested: We are requesting information regarding the locations of any plant, wildlife or aquatic Species at Risk occurrences in or near the project area. The information will be used to assess potential project impacts on the environment, including rare and protected species.

Format Requested: Microsoft Excel Spreadsheet

Location: The site consists of black spruce bog forest within the Rural Municipality of Lac du Bonnet.

The proposed project is situated approximately 21 km east of Beausejour, and approximately 3.5 km north of Highway #44.

Centre Point: Zone 14U, 701510m E, 5553322m N

A KML file will be provided.

action: Submit

Within site footprint

Category	Scientific Name	Common Name	S Rank	ESEA	SARA	COSEWIC
No listed or tracked species occurrences found at this time						

Within 2km radius of site boundary

Category	Scientific Name	Common Name	S Rank	ESEA	SARA	COSEWIC
Vertebrate Animal	Contopus virens	(Eastern Wood-pewee)	S3B		Special Conc	Special Concern

General Area Records Low Locational Accuracy

Category	Scientific Name	Common Name	S Rank	ESEA	SARA	COSEWIC
Vascular Plant	Cypripedium arietii	(Ram's-head Lady's-slipp	S2S3			

General Area Records Apparently Similar Habitat

Category	Scientific Name	Common Name	S Rank	ESEA	SARA	COSEWIC
Vertebrate Animal	Storeria occipitoma	(Northern Redbelly Snak	S3S4			
Animal Assemblage	Snake Hibernaculu	(Snake Hibernaculum)	SNR			
Vascular Plant	Cladium mariscoide	(Smooth Twig-rush)	S2S3			
Vascular Plant	Rhynchospora alba	(White Beakrush)	S3			
Vascular Plant	Selaginella selagino	(Low Spikemoss)	S3S4			
Vertebrate Animal	Antrostomus vocife	(Eastern Whip-poor-will)	S2S3B	Threatened	Threatened	Threatened
Vascular Plant	Potamogeton ampl	(Large-leaved Pondweed	S3			

Notes
None.

Dan Leitch

From:	+WPG574 - HRB Archaeology (SCH) <HRB.archaeology@gov.mb.ca>
Sent:	August-12-20 4:15 PM
To:	resource@system.kgsgroup.com
Subject:	FW: Heritage Screening Request Form - KGS Group Transmittal No. 20-0293-003-0004 (AAS-20-16092)
Attachments:	Basic HRPP Guidelines Key Questions and Protocols to Consider_V2.docx; Basic Heritage Resources Protection Planning_Key questions and protocols for consideration.pdf

Good afternoon,

Further to your request for the above noted heritage screening, the Historic Resources Branch has examined the location in conjunction with Branch records for areas of potential concern. The potential to impact significant heritage resources is believed to be low based on available data and, therefore, the Historic Resources Branch has no concerns with the proposed development at this time.

However, if heritage resources are encountered in association with these lands during testing and development, the Historic Resources Branch may require that an acceptable heritage resource management strategy be implemented by the developer to mitigate the effects of development on the heritage resources. Heritage Resources includes fossils and/ or animal bones that may be preserved in the peat.

I have attached a template for a heritage resource management plan in order to help create a procedure preparing for the event if a heritage object is found. It is helpful for site managers, employees, contractors to have a check-list or steps of what to do and whom to call should heritage resources be accidentally encountered.

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

Brittany Romano
Impact Assessment Archaeologist
Historic Resources Branch | Manitoba Sport, Culture and Heritage
213 Notre Dame Avenue, Main Floor | Winnipeg, MB | R3B 1N3 brittanyromano@gov.mb.ca

-----Original Message-----
From: KGS Resource <resource@system.kgsgroup.com> On Behalf Of Dan Leitch
Sent: August 11, 2020 3:00 PM
To: Tsukamoto, Suyoko (SCH) <Suyoko.Tsukamoto@gov.mb.ca>
Cc: Shaun Moffatt <smoffatt@kgsgroup.com>; KGS Document Control <jrokyta@kgsgroup.com>
Subject: Heritage Screening Request Form - KGS Group Transmittal No. 20-0293-003-0004

Dear Suyoko Anne Tsukamoto,

Enclosed please find the Screening Request Form for the Sun Gro Evergreen 1 peat harvesting development proposal. Also included is a figure showing the regional site location of the Evergreen 1 sub-area and a kmz file for the Evergreen 1 sub-area, within which all work will be done.

Please let us know if you have any questions.

Regards,

Dan Leitch

SENT BY: Josephine Rokyta [Document Control]

NOTE: Please confirm receipt via email.

KGS
GROUP

Experience in Action