

SUMMARY OF COMMENTS/RECOMMENDATIONS

PROPONENT: SUN GRO HORTICULTURE CANADA LTD.
PROPOSAL NAME: RAMSAY POINT PEAT MINE DEVELOPMENT
CLASS OF DEVELOPMENT: 2
TYPE OF DEVELOPMENT: MINING – PEAT HARVESTING & PROCESSING OPERATIONS
CLIENT FILE NO.: 5496.00

OVERVIEW:

On December 9, 2010, Manitoba Conservation received a Proposal dated December 8, 2010, from Sun Gro Horticulture Canada Ltd. to develop the Ramsay Point Bog to harvest peat for the production of horticultural peat products. The proposed development is located on Crown Land and covers an area of approximately 1170 ha. The targeted peatland is located approximately 40 km northwest of Riverton, MB on part of Sections 33 and 34, Township 27, Range 4 EPM and on all parts of Sections 2 to 4, 9 to 11 and 14 to 16, Township 28, Range 4 EPM.

No public concern was received in response to the advertisement of this proposal in the Interlake Spectator published on Thursday, December 30, 2010. The proposal was placed in the Public Registries at the Millennium Public Library, the Manitoba Eco-Network, Village of Riverton, the RM of Bifrost and the Conservation Library (Main). The proposal was distributed to TAC on December 16, 2010, with the closing date for TAC and Public comments on January 31, 2011.

COMMENTS FROM THE PUBLIC:

No public responses were received.

COMMENTS FROM THE TECHNICAL ADVISORY COMMITTEE:

Canadian Environmental Assessment Agency

- Based on their staff survey, application of the *Canadian Environmental Assessment Act* by a federal authority will not be required for this project.

- Department of Fisheries and Oceans has indicated in its response that it will provide a letter of advice to the proponent for a stream crossing connected with the proposed construction of the peat mine development access road.
- Environment Canada has notified the Agency that it has an interest in the project related to its mandate and would like to participate in the provincial review.

Disposition: Comments were provided to the proponent. Manitoba Conservation will continue to work cooperatively with federal agencies on this project.

Manitoba Conservation, Aboriginal Relations Branch

A review of the Environment Act Proposal for the Sun Gro Horticulture Canada Inc. (Sun Gro) development of Ramsay Point Bog for peat harvesting activities has been done by the Aboriginal Relations Branch at Manitoba Conservation. A number of comments and recommendations have been made and a summary of those is briefly described here.

For the last sixteen years Sun Gro has held the quarry leases (QL) 1107 to 1110, 1156, 1761 and 1762 and pending QL 2441 and 2460. This covers an area of approximately 1,790 ha in size and is located on part of Sections 33 and 34 Township 27, Range 4, E1 and on all or parts of Sections 2 to 4, 9 to 11 and 14 to 16, Township 28, Range 4, E1. This area is within the Moose Creek Provincial Forest and within the community interest zones of Peguis First Nation and Fisher River First Nation.

As Manitoba Mines appears to be the lead department on granting approval for this project, we suggest that they complete the Consultation Assessment form (attached) to determine whether the appropriate consultation has taken place or if Crown consultation is required to ensure that the proposed project will not infringe upon or adversely affect the exercise of Treaty or aboriginal rights.

It is our opinion that since this area falls within the Peguis First Nation Treaty Land Entitlement (TLE) Community Interest Zone (CIZ), that Manitoba Mines must undertake two separate and distinct processes with this First Nation. The first being their right to be consulted to see if this proposed project will infringe upon or adversely affect the exercise of Peguis First Nations members Treaty or aboriginal rights. The second process is to respect the CIZ identified within the Peguis TLE.

There is also the potential to affect the Kinonjeoshtegon (Jackhead) First Nation, which is north of the area. Bloodvein First Nation may also need to be consulted, as the ferry lands on the northeast section of the provincial forest, giving the First Nation access to the provincial forest lands. The winter road from Bloodvein also connects just north of Pine Dock, giving the First Nation access to the provincial road that runs by the mine site.

As this project has an expected lifespan of 35 to 45 years, it is important to establish the traditional use of this land, and determine how that use would be impacted by this project. Though the land will recover over time once the mining project is completed, it must be remembered that this area will be inaccessible to Aboriginal, Metis, and First Nation people for a whole generation.

Activity of this duration will have a significant impact on the environment in the area, including, but not limited to, disrupting habit for large game; changing the soil moisture content, therefore effecting the types of flora able to grow in the area; and, ground water filtration for the Lake Winnipeg watershed.

The Government of Manitoba has a duty to consult in a meaningful way with First Nations, Métis communities and other aboriginal communities when any proposed provincial law, regulation, decision or action may infringe upon or adversely affect the exercise of a treaty or aboriginal right of the First Nation, Métis community or other aboriginal community. We assume that we do not know all of the aboriginal rights that are beyond the assertions already made and therefore information gathering and consultation results in these issues being brought forward by the people who practice them and use the land. Issues are accommodated and building relationships in a process like this includes assessments on the following; Traditional Ecological Knowledge (TEK), capacity building and education, adequate information sharing and access, environmental impacts, heritage, cultural and significant sites, socio-economic impacts and public involvement in the process from the start.

The Branch recommends that traditional ecological knowledge be sought and applied where possible. The Branch recognizes that incorporating traditional ecological knowledge is essential to land and natural resource use planning.

Disposition: Comments were forwarded to the proponent. Comments regarding consultation were also provided to Manitoba Department of Science, Technology, Energy and Mines, Mines Branch for consideration. On June 13th, 2011, Environmental Assessment and Licensing Branch was informed by Manitoba Department of Science, Technology, Energy and Mines, Mines Branch that Section 35 consultation was completed and no environmental concerns were identified.

Manitoba Conservation, Pollution Prevention Branch

The Air Quality Section has reviewed the above Environment Act proposal application and offers the following air quality related comments:

Potential dust generation (or suspended particulate matter) and emissions from vehicles and equipment during the construction and operation phase are adequately addressed in the proposal.

A discussion on GHG emissions from the proposed managed peat extraction is included in the proposal but no quantification of emissions was mentioned. With reference to The

Environment Amendment Act (S.M. 2009, c. 25), potential GHG emissions will be taken into account during the evaluation of a proposal under the Act. Quantification of GHGs may be necessary not only during the assessment of the proposal but also in the inventory of Provincial GHG sources.

The Air Quality Section has undertaken some of its own initial estimates of potential GHG releases. When fully developed, the on-site GHG emissions is comprised by the emissions from the area under extraction as well as peat decomposition from stockpiles (land use and land use change) and is estimated to be 12,413 tonnes CO₂e per year. This is based on the stated 1170 hectare surface area to be utilized at full production. Another 3310 tonnes CO₂e per year GHG emissions is estimated to come from the extraction and processing activities. Approximately 8,276 tonnes CO₂e per year will be from the transport of peat to market (not sure if this should be allocated to the harvesting activity vs. use of the product??). Therefore, the total GHG potentially associated with the development could be up to 24,000 tonnes CO₂e per year.

Though not part of the development activity since this relates to commercial use of the product, ~58,758 tonnes CO₂e per year could result from the decomposition of the peat during application, storage, and other uses (Cleary, et al. 2005).

If the proposed site remained undisturbed and unutilized, the net CO₂ accumulation (carbon sink function) per year is estimated to be ~ 429 tonnes CO₂e (Cleary, et al. 2005).

Though the GHG release from the proposed operation is not overly large, there might be some merit in withholding a Licence until provincial policy on peat lands is developed (per previous advice from the Department's Sustainable Resource and Policy Management Branch).

Disposition: Comments regarding greenhouse gas emissions were forwarded to the proponent with a request for further information (see 'Request for Additional Information' section of this summary).

Manitoba Conservation, Parks and Natural Areas Branch

The proposed peat mine is located just west of Beaver Creek Provincial Park with the closest part of the development being only 500 meters away at the southern end of the park. Beaver Creek Provincial Park offers recreational activities including camping, beach use, day use and cottaging. The proposed access road to the proposed peat mine development is approximately 500 meters from the southern entrance to the park. It is proposed that traffic flow into the development will be low initially but will increase to 196 haul trucks at peak production. Proposed seasonal operation of the peat mine (April through October) coincides with peak park usage times. Increased large truck traffic going into and out of the proposed peat mine so close to the park entrance has the potential to greatly impact park users. PR 234 is also a gravel road and even with the

proposed mitigation measures for dust control there is the potential for increased amounts of dust in the air to impact visitor experiences.

To reduce on-road conflicts with park users and reduce the potential increase in dust going in to the park, Parks and Natural Areas Branch requests that Sun Gro Horticulture Canada Inc. move the access road and staging area further south in its development area to where trails accessing the quarry lease already exist.

Disposition: Comments were forwarded to the proponent. Comments regarding consultation and concerns related to the proximity of the proposed road access were also provided to Manitoba Department of Infrastructure and Transportation, Highway, Planning and Design Branch for consideration.

Manitoba Conservation, Sustainable Resource and Policy Management Branch & Land Programs Branch

Section 4.1.1 Amphibians and Reptiles - A 300 meter buffer is preferred around water bodies such as Ranger Lakes, unnamed creeks connecting them and the unnamed lake along Beaver Creek. The 100 meter suggested buffer is inadequate to support northern leopard frogs and other amphibians that commonly migrate longer distances from overwintering ponds to foraging habitats. As specified in the submission the northern leopard frog is a species of special concern under the Federal *Species at Risk Act* and as such additional mitigation should be considered.

Section 6.2.1 Loss of Wetland - The loss of wetlands at a regional level may have cumulative effects when consideration is given to the current extent of active peat leases on Washow-Fisher Peninsula. Commercial development of these additional leased lands will increase the number of acres of wetland affected.

Section 6.2.5 Surface Water Contamination - Only suspended particles are identified as the primary surface water contaminant. Settling ponds are identified as the mitigation measure to address increased sedimentation. **6.3.4 Surface Water** section makes reference to potential issues related to changes to natural pH levels in the receiving waters from the peat sites. Northern leopard frogs occur in these areas and changes in pH may negatively affect their survival. The proponent indicates that rate of discharge from the settling ponds is the primary method to control water chemistry. It is the responsibility of the proponent not to affect the water quality including pH levels of downstream receiving waters. The installation of the limestone or carbonate lined drainage ditch at the settling ponds as a suggested mitigation measure to manage pH should be considered as a requirement during the construction of these outlet structures. The proponent acknowledges a moderate impact on surface water but does not provide any detailed mitigation. The proponent indicates they plan no mitigation but rather to monitor discharge flow rates. The testing identified for Beaver Creek in 6.3.8 should be considered as part of their monitoring plan.

The proponent should be advised that a drainage licence will be required for and planned drainage system if the project proceeds. A detailed drainage plan will be required.

Sections 6.3.6 Vegetation and 6.5.1 Fires and Explosions - The proponent is encouraged to work cooperatively with the Conservation District Office in regards to development of an emergency fire plan to address wild fire prevention and suppression.

If the development does proceed the proponent will be required to obtain a Crown Land Work Permit for site development for those portions of the area that are outside of existing order in council areas (Moose Creek WMA). The work permit will include conditions related to fire prevention etc. The proponent should also be advised that on site operations may be suspended or modified by Conservation due to high fire hazard indices.

Wild land fires are of particular concern in relation to not only this site but the intensive recreational developments that exist along PR 234 as well as forest resource values. For that portion of the area that is within the Moose Creek Wildlife Management Area a Wildlife Management Area Use Permit is required and that permit is issued by the Wildlife Ecosystem Protection Branch.

Section 6.3.7 Wildlife/Habitat - A resource harvest road access plan should be provided. That plan will identify proposed harvest roads within the developed site as well as proposed access control methods.

Section 6.3.8 Aquatic Biota/Habitat -The mitigation deals only with effects of sediments and does not provide any information on managing pH level changes in the receiving water from the settling ponds.

Beaver Creek is the most significant lotic habitat in over 100 km of Lake Winnipeg shoreline. The report should have provided a minimum of three sections of a pair meander (12X bank full widths, approximately 130m long) measured including: bankfull dimensions, longitudinal profile including thalweg, water surface, bankfull elevation, and low bank elevation and three cross sections, one at a riffle one at a pool and one at a run as well as pebble counts from the riffles. The proponent should provide the locations of the electrofishing stations and the effort extended at each station along with settings. Netting sites referenced should be identified, along with effort, mesh sizes, net dimensions, hanging ratio etc. Information on the fish sampled should include species, lengths, weights, and ages.

Section 6.4.7 Areas of Interest -The development of approximately 200 new recreational cottage lots in the last five years could result in complaints if the operation results in creating negative effects on the expected recreational quality of these new developments. The proponent is encouraged to operate in a manner that does not detract from these recreational values.

Section 6.7.2 Cumulative Environmental Effects - As identified in 6.2.1 although the proponent indicates that the total and potential peat development as proposed is far below

the actual areas of bog habitat within the study area the report does not indicate that most if not all the large bogs on Washow-Fisher Peninsula are all held under current valid quarry leases. The proponent indicates that reclamation efforts are unable to ensure the restoration of bog habitats. Based on this if the remaining bogs are commercially developed the cumulative effects on the overall areas of bog habitat will be significant.

Section 7.3 Regulatory Requirements - The list provided is not complete as the proponent is also subject to the Wildlife Act, Crown Lands Act, and Forest Fire Prevention Act etc.

Section Section t) Bog Restoration Procedures in Appendix C Mine closure plan should provide specific details in regards to road retirement of harvest and access roads.

Disposition: Several comments can be accommodated as licence conditions. Comments regarding the impacts to surface water and road retirement were forwarded to the proponent for additional information (see 'Request for Additional Information' section of this summary).

Manitoba Infrastructure and Transportation, Highway Planning and Design Branch

- The proponent shall ensure that all proposed access and service roads that require access onto a Provincial roadway are reviewed to conform to Department standards. All proposed access roads accessing onto Provincial roadways, as well as structures located within the controlled area, will require permit approvals from Manitoba Infrastructure & Transportation. The proposed development is located adjacent Provincial Road (PR) No. 234, as such the proponent should be informed that any new, modified, or relocated access connecting onto PR234 may require a permit from MIT (including change of access). A permit may also be required for any construction (above or below ground level) within 38.1m (125ft.) or for any plantings within 15.2m (50ft.) from the edge of the right-of-way of PR234.
- Traffic volumes generated by the proponent will be monitored to ensure that the volumes don't exceed 50vpd making left turn movements or 200vpd. If these traffic volumes are exceeded intersection improvements are warranted and the proponent shall be responsible for these intersection improvements.
- Existing drainage patterns are to be maintained. All affected slopes, ditches etc. to be restored to an acceptable condition.

Disposition: These comments were forwarded to the proponent. Comments regarding drainage and restoration can be accommodated with licence conditions.

Manitoba Water Stewardship

- At this time, Manitoba Water Stewardship objects to the issuance of an *Environment Act* Licence until all of following items are resolved:
 - The Province of Manitoba is currently developing a Boreal Peatland Strategy. From a precautionary principle perspective, Manitoba Water Stewardship asserts to defer issuing an *Environment Act* Licence until this Boreal Peatland Strategy is implemented.
 - Prior to beginning construction of the proposed development, the proponent is required to submit an application for a Water Rights Licence to Construct Water Control Works, including the submission of an engineered drainage plan, prepared by a Professional Engineer, registered to practice in the Province of Manitoba.
 - A contact person is Mr. Geoff Reimer C.E.T., Senior Water Resource Officer, Water Control Works and Drainage Licensing, Manitoba Water Stewardship, Box 4558, Stonewall, Manitoba R0C 2Z0, telephone: (204) 467-4450, email: geoff.reimer@gov.mb.ca.
 - The proponent shall develop and implement a water quality monitoring program, including the following measures:
 - Surface water quality samples should be collected monthly during the construction phase and during regular operating months (April to October), and within 24 hours after a significant rain event.
 - Samples must be analyzed at a laboratory accredited by the Canadian Analytical Laboratory Association for pH, total suspended sediments, total phosphorus, total nitrogen, and metals (similar to table 4 of the proposal).
 - The proponent shall submit a copy of the monthly sampling results to Manitoba Water Stewardship's Water Quality Management Section, two weeks after the results are provided to the proponent.
 - Concerning fish and fish habitat pre-project assessment, the following is required to be documented and incorporated into a monitoring plan:
 - Within Beaver Creek establish three reference sections each including a pair of meanders (12 x bankfull width or 130 m long), measuring the following physical characteristics within each reach:
 - Cross sectional measurements at a riffle, pool and run (widths, depths, bankfull, water surface and low bank elevation);

- Longitudinal profiles (including thalweg along with water surface, bankfull estimates and low flow height) and substrate measurements;
- Determination of velocities and flows within each reach.
 - If flows cannot be monitored continuously electronically, then the proponent shall install staffing gauge(s).
 - Velocities can be measured throughout the open water season to determine flows at depths and establish a hydrograph.
 - Juvenile stages of large bodied fish (pike/yellow perch) and small bodied forage species can be affected by changes in depth and velocities.
- For the Ranger Lakes conduct an assessment of habitat in the area where the outlet ditch will discharge, including benthic invertebrate collections in a graduated sampling effort (area of impact outward) and establish a reference area of similar habitat not within the anticipated zone of influence.
- Fish sampling is currently not repeatable. Delineate electrofishing stations and the effort expended at each station along with the settings. For gillnet sets, sampling locations, effort, mesh sizes, net dimensions, hanging ratio etc. should be documented. If minnow traps are implemented, an adequate amount of time and number of traps set shall be employed.
- Fish data measurements shall include lengths, weights, and ages and sampling should be reflective of the open water season (monthly), rather than conducting only one sampling.
- The proponent shall comply with Manitoba Water Stewardship's Wetland Policy:
 - The net loss of semi-permanent or permanent wetlands shall not occur. Wetlands are defined as areas that are periodically or permanently inundated by surface or ground water long enough to develop special characteristics including persistent water, low-oxygen soils, and vegetation adapted to wetland conditions. These include but are not limited to swamps, sloughs, potholes, marshes, bogs and fens.

- A proponent shall establish and maintain a buffer zone with at least a 15-metre width.
- Manitoba Water Stewardship requires clarification in the following areas:
 - Sedimentation Ponds:
 - Which retention time are the ponds designed for and is this adequate time to allow settling?
 - The proposal notes that outlet drains will continue until the bottom of the ditch is equal to the top of the natural ground (ditch daylighted out).
 - At each discharge location, state the distance from the edge of the receiving body.
 - Does the ditch extend into the 100 metre buffer established for Ranger Lakes and connecting creek channels and smaller water bodies, Beaver Creek, and unnamed lake? If not, describe the area that is considered upland vegetation within the riparian area and whether the vegetation is conducive to additional water.
 - For the road access culvert at PR 234, ensure the stream crossing is designed to handle flows (preferably 1 in 100) and allow fish passage.
 - Regarding the monitoring, in section 6.3.4 of the proposal, a moderate impact is anticipated, mitigation is not mentioned. What type of monitoring is being proposed?
 - Post Closure Plan:
 - The proposal notes that, for the purposes of peat regeneration processes, a minimum of 1.0 metre of peat will remain after harvesting, unless Manitoba Conservation approves harvesting peat to a lower depth. However at the beginning of the proposal, it is indicated that only 840 ha of the 1170 ha contain peat depths greater than 1 metre.
 - Has Manitoba Conservation approved harvesting peat to a depth where less than 1 metre of peat will remain after harvesting is completed?
 - The proposal indicates that the proponent will restore/reclaim peat with experience acquired from the

Elma restoration site and following the Peat Reclamation Guidelines.

- Restoration at the Elma site occurred over 12 years ago. The proposal provided data from only the first few years after restoration techniques were implemented.
 - The proponent is requested to provide recent research results from the restoration of the Elma site.
- Manitoba Water Stewardship submits the following comments:
 - The Manitoba Department of Water Stewardship is mandated to ensure the sustainable development of Manitoba's water resources. Manitoba Water Stewardship is committed to the goals of: protecting aquatic ecosystem health; ensuring drinking water is safe and clean for human health; managing water-related risks for human security; and stewarding the societal and economic values of our waterways, lakes and wetlands; for the best water for all life and lasting prosperity. Manitoba Water Stewardship achieves these goals, in part, through administering legislation, including *The Water Protection Act*, *The Water Rights Act*, and *The Water Power Act*.

Disposition: Comments were provided to the proponent. Comments regarding monitoring, Closure Plan and Water Rights Licences can be accommodated as licence conditions. Some comments were forwarded to the proponent for additional information (see 'Request for Additional Information' section of this summary).

ADDITIONAL INFORMATION REQUEST:

EAL Branch contacted the proponent with questions from TAC members and the public concerning the project on February 11 and 24, 2011. A submittal in response to comments was received on March 14, 2011 and included the following in response to TAC member questions:

1) Sedimentation Ponds – Which retention time are the ponds designed for and is this adequate time to allow settling? (Water Stewardship)

The sedimentation ponds will be constructed to the typical design criteria as noted in Section 3.6.1 (pg 13) of the EAP, which includes a minimum retention time of two hours. The retention time will vary in response to the inflow rate of drainage water however it will never be less than the minimum two hours to ensure adequate time to allow settling. Also as noted in the EAP a control culvert with a sliding gate is located in the inlet ditch upstream of the sedimentation pond which can be used to

reduce or stop inflow to the sedimentation pond in the event that inflow rates exceed the design flow criteria.

- 2) **The proposal notes that outlet drains will continue until the bottom of the ditch is equal to the top of the natural ground (ditch daylight out). At each discharge location, state the distance from the edge of the receiving body. Does the ditch extend into the 100 metre buffer established for Ranger Lakes and connecting creek channels and smaller water bodies, Beaver Creek and unnamed lake? If not, describe the area that is considered upland vegetation within the riparian area and whether the vegetation is conducive to additional water. (Water Stewardship)**

The distance from where the outlet drains daylight out to the edge of the receiving water body cannot be determined at this point as this will be dependent on topography at each discharge location and the depth of the outlet drain. However, it is very likely that the outlet drains will extend into the 100 metre buffer established around the water bodies. The vegetation within these 100 m buffer areas consists of the typical Black Spruce forest stands (V31 to V33) that covers the entire bog area as described in the EAP Section 4.1.7. These vegetation communities within the riparian area do not differ from the vegetation present across the rest of the bog area. These areas are characterized by wet to very wet soil conditions and poor drainage and are not considered upland vegetation and therefore will not be affected by additional water draining into the area. The only upland vegetation present within the Quarry Leases is a small section in the northwest portion of QL 1761 which, as shown in Figure 3 of the EAP, is not proposed to be developed as there is very little peat present.

- 3) **Regarding the monitoring, in Section 6.3.4 of the proposal, a moderate impact is anticipated. Aside from sedimentation ponds, mitigation of surface water impacts is not mentioned. What type of mitigation is being proposed? (Water Stewardship, Sustainable Resources and Policy Management Branch and Land Programs Branch)**

The baseline water quality sampling conducted, as described in Section 4.1.6 of the EAP indicates that the potential effect of drainage water from the peat bog on the downstream receiving water bodies is primarily associated with Total Suspended Solids (TSS) and pH. Therefore the proposed mitigation measures described in Section 6.3.4 focused on addressing these potential effects. Samples collected from the bog area had a few nutrients concentrations that are slightly higher than those measured in Lake Winnipeg, however, all of the nutrient concentrations were within the applicable criteria for the protection of freshwater aquatic life and therefore not a concern. Likewise, the sampling indicated that the water in the bog and downstream receiving water had similar metal concentrations. Additionally, the proposed development will not alter the existing natural drainage pattern with peat water continuing to discharge into the adjacent streams and lakes in the area as they currently do. The volume of water discharged from each 60 ha area during initial

drainage is also minimal in comparison to the drainage area within the watershed and the volume of the receiving water body.

The sedimentation ponds proposed to mitigate potential TSS effects are also equipped with floating booms and have a control gate at their inlet. As noted in Section 6.3.4, if the control of the discharge rate is not sufficient in maintaining the water chemistry, in particular the pH levels, a limestone or carbonate lined drainage ditch can be installed to mitigate the pH of the draining bog water before entering the sedimentation pond. Specific mitigation measures to address nutrient and metal concentrations are not required at this time based on the results of the baseline water quality monitoring. Additional mitigation measures can be developed, if required, based on the results of water quality monitoring during operations.

4) Closure Plan: Appendix C should have specific details regarding road retirement (bog roads and access road). (Sustainable Resources and Policy Management Branch and Land Programs Branch)

Sun Gro will follow the general closure plan guidelines as outlined in the Mine Closure regulation 67/99 Section 4 for buildings and surface infrastructure sub section d) Transportation and Infrastructure. Sun Gro will maintain the access road and any necessary bog roads in sufficient condition to allow access to monitor the site closure activities. Additionally, Sun Gro will check to see whether any other authorities wish to maintain and legally accept responsibility for the access road before closing it down. If the roads are no longer necessary the site will be restored as follows:

- Culverts and pipes will be removed, natural stream flows will be restored and stream banks and ditches stabilized by planting vegetation. If vegetation cannot be maintained and a substantial threat of erosion exists, granular material or riprap may be used;
- Road surface, shoulders, escarpments, steep slopes, regular and irregular benches, etc. will be rehabilitated to prevent erosion; and
- In general, road surfaces and shoulders will be scarified, blended into natural contours and revegetated.

5) Complete carbon analysis. (Air Quality Section)

Recent work by Cleary et al. described the net greenhouse gas (GHG) emissions from the Canadian Peat Industry. 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. The net increase is caused by an increase in the rate of in situ decomposition through increased diffusion of oxygen, increased CO₂ emissions and reducing CH₄ emissions, and a reduction of ecosystem production resulting

through the removal of living biomass from the peatland surface. Cleary et al. 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 (PUE - 1061 t/km²/yr) and within cutover peatland under restoration (CPUR – 1288 t/km²/yr).

The proposed development plan, as described in the EAP, consists of beginning harvesting of 60 ha in 2013. An additional 60 ha area will be developed each consecutive year, with only 30 ha opened in the last year to reach the maximum harvesting area of 1170 ha in 2032 and when no additional area will be opened. Peat mining operations will continue at this maximum harvesting area of 1170 ha until approximately 2042 at which time sections of the Ramsay Point Bog area are expected to be mined down to the final planned depth of mining and progressive closure begins. For calculating the GHG emission it was assumed that progressive closure will consist of closing a 60 ha area per year beginning in 2042 with the final 90 ha area closed in 2060.

Recent work conducted by Waddington et al. suggested that sphagnum restoration could result in a carbon sink in as little as two years post restoration. Based on this KGS Group assumed that the areas experiencing restoration become net neutral for GHG after 1 year post restoration when calculating CO₂ equivalent values. This was done in order to eliminate uncertainty associated with the CPUR values and the potential requirement for balancing carbon credits.

Using the equations established by Cleary et al. incorporating PUE and CPUR, the total quantity of CO₂ equivalent produced due to land use change throughout the estimated 48 years of development was calculated to be 374.75 x 10³ t - CO₂ eq. 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%. However, GHG emissions from decomposition are associated with the end use and should not be attributed to the producer. Therefore, after 48 years of operation of Sun Gro's Ramsay Point Bog, in addition to the quantity of GHG emitted from land-use change the GHG emissions from peat harvesting and processing would be 99.93 x 10³ t - CO₂ eq. and from transportation to market would be 249.83 x 10³ t - CO₂ eq. for a total of 724.51 x 10³ t - CO₂ eq. This is equivalent to 15.10 x 10³ t - CO₂ eq/yr. The most recent available data for CO₂ emissions in Canada are for 2008, which had a total value of 734,000 x 10³ t - CO₂ eq. Therefore, an average year of production of the Ramsay Point Bog will account for approximately 0.002% of the total annual emissions for the country.

Regardless, this quantity of CO₂ equivalent can be decreased by incorporating mitigation measures (as presented in Section 6 of the EAP) to reduce and/or prevent GHG missions throughout the life cycle of peat harvesting.

References:

Cleary, J, N.T. Roulet and T.R Moore. 2005. Greenhouse Gas Emissions from Canadian Peat Extraction, 1990-2000: A Life-cycle Analysis. *Ambio*, vol. 34, pp 456-461.

Waddington, J.M, M. Strack and M.J. Greenwood. 2010. Toward Restoring the Net Carbon Sink Function of Degraded Peatlands: Short-term Response in CO₂ Exchange to Ecosystem-scale Restoration. *Journal of Geophysical Research*, vol. 115. G01008, doi:10.1029/2009JG001090.

6) Location of downstream monitoring locations in Figure 3;

Figure 3 (enclosed) has been revised to show the surface and peat water sampling locations such that the downstream monitoring locations are shown as requested. To show the proposed drainage plan in greater detail the scale used for Figure 3 in the EAP resulted in not being able to include the sample locations downstream along the drainage out of Ramsay Lakes at the culvert crossing under PR 234 (R3) and where it drains into Lake Winnipeg (R4). Therefore the water sampling locations were shown on Figure 8 of the EAP along with the biological sampling locations and transects. The scale has been changed in addition to adding the sampling locations in the revision to Figure 3 that is enclosed.

7) List of Quarry Leases and associated area for each.

The list of Quarry Leases and their associated area for the proposed Ramsay Point Peat Mine Development are summarized in the following table as requested. At the time of preparing this response QL 2441 and QL 2460 are still pending.

Quarry Lease No.	Area (Ha)
QL-1107	259.56
QL-1108	186.38
QL-1109	198.09
QL-1110	268.17
QL-1156	257.08
QL-1761	259.30
QL-1762	219.80
QL-2441*	64.00
QL-2460*	64.00
Total	1776.38

8) Please provide additional information how the development will impact on the rate and timing of drainage. Also, please provide additional information to support the conclusion that increased drainage from the peatlands (during the initial drainage and operation) is minimal by comparison to the current background flow rates of the receiving waters (Beaver Creek and Ranger Lakes). (Water Stewardship)

As described in Section 3.6.1 of the EAP (pg 15) Ramsay Point Bog will be developed by opening 60 ha of peatland per year. Based on the field ditches being cut to a depth of 1.5 m the total volume of peat to be drained each year is approximately 900,000 m³. Assuming an initial average of 95 percent moisture content and that an average of 25 percent moisture content drains, the volume of drainage water from 60 ha of peatland will total approximately 215,000 m³.

Once a drain is cut it takes approximately 3 weeks for the initial draining to occur. It will take approximately 11 weeks to cut the 56 field ditches required for each 60 ha area. Therefore if the drains are cut during active draining (summer) it will take approximately 14 weeks to drain the entire 60 ha area, resulting in an average flow of 0.025 m³/s. In comparison, the drains are typically cut when the ground is frozen between January and April and therefore the entire 60 ha area would drain over a period of 3 weeks during the spring freshet. Drainage of the approximately 215,000 m³ over a three week period results in an average flow of 0.118 m³/s.

Under the existing conditions, with no constructed drainage, the drainage from a 60 ha area during the design discharge would be 0.1 m³/s. Therefore the constructed drainage with an average flow of 0.118 m³/s would result in an increase of 18% for the 3 weeks of drainage under typical conditions. This temporary increase in flow rate from the bog area would have a negligible impact on Beaver Creek and Ranger Lakes for the following reasons;

- The 60 ha area being drained under development is only 0.9% of the 6,500 ha total drainage area for Beaver Creek and only 1.8% of the 3,280 ha total drainage area for Ranger Lakes;
- The temporary increase in flow rate of 0.018 m³/s (18% over the existing flow) to Beaver Creek is an increase of only 0.2% compared to the design discharge of 10.4 m³/s in Beaver Creek; and
- The total drainage volume of 215,000 m³ from a 60 ha area is only approximately 6% of the volume held by the Ranger Lakes.

Once the initial increased drainage is completed following drain cutting the amount of drainage from the developed areas would be the same as drainage prior to development. The timing of drainage, however, would be slightly modified. During a rain event there will be a slight lag (delay in time) before drainage from a developed area begins compared to undeveloped peat land and then the drainage rate would be slightly higher because of the constructed drains. As noted above the increased drainage rate would be negligible compared to the flow in Beaver Creek and as described in the EAP the sedimentation ponds are equipped with gates to control the flow if required.

DISCUSSION AND ANALYSIS:

This information is sufficient to allow several TAC concerns to be addressed through licence conditions. There are no overriding technical issues associated with this project that would preclude the issuance of an Environment Act Licence with appropriate conditions.

PUBLIC HEARING:

No requests were received for a public hearing on the project. Technical issues surrounding the project are sufficiently understood. A public hearing is not recommended for the project.

RECOMMENDATION:

All comments received on the Proposal can be addressed as licence conditions or have been forwarded to the proponent for information. It is recommended that an Environment Act Licence be issued for the project subject to the limits, terms and conditions as described on the attached draft licence. Administration of the licence should be assigned to the Central Region, with technical assistance to be provided by Environmental Assessment and Licensing Branch upon request.

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