Keeyask Generation Project

PRELIMINARY DRAFT

Resource Use Monitoring Plan

Hydropower Limited Partnership

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KEEYASK GENERATION PROJECT

RESOURCE USE MONITORING PLAN

DRAFT

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PREFACE

KEEYASK ENVIRONMENTAL PROTECTION PROGRAM

An Environmental Protection Program (the Program) has been developed to mitigate, manage and monitor potential environmental effects described in the *Keeyask Generation Project: Response to EIS Guidelines* during the construction and operation phases of the Keeyask Generation Project (the Project) shown on Map 1(*Drafters Note: general location map to be inserted)*. The Program includes a collection of plans grouped in the following categories: Environmental Protection Plans, Environmental Management Plans, and Environmental Monitoring Plans.

Figure 1 lists all of the plans included in the Program. It also demonstrates how the Program will be managed. The Keeyask Hydropower Limited Partnership (the Partnership) has delegated authority to Manitoba Hydro to manage construction and operation of the Project including implementation of the Program. The organizational structure of the Partnership for this aspect of the Project includes a Monitoring Advisory Committee (MAC), which includes participants from each of the Keeyask Cree Nations (KCNs) and Manitoba Hydro. Manitoba Hydro will be guided on the implementation of the Program by the MAC, the Partnership Board of Directors and ongoing discussion with Regulators.

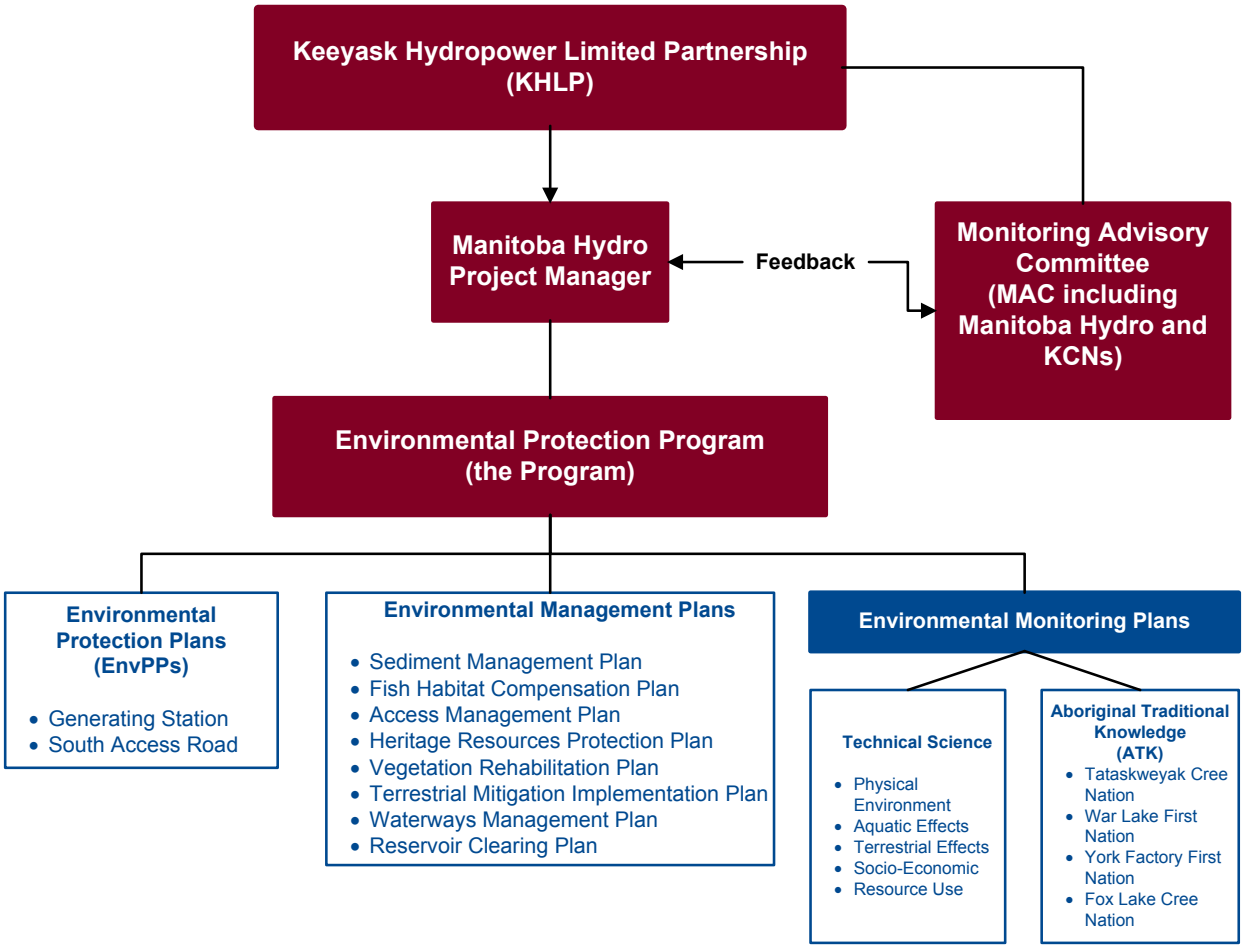

Figure 1: Environmental Protection Program

The Environmental Protection Plans (EnvPPs) provide detailed, site-specific environmental protection measures to be implemented by the contractors and construction staff to minimize environmental effects from construction of the generating station and south access road. They are designed for use as reference documents providing the best management practices to meet or exceed regulatory requirements. EnvPPs are organized by construction activity, highlighting measures to reduce the impact of a specific work activity (e.g., tree clearing or material placement in water). Contractors' compliance with the EnvPPs is a contractual obligation. Under Manitoba Hydro's construction site management, a Site Environmental Officer will be responsible for monitoring compliance and determining when corrective actions are required.

The Environmental Management Plans focus on minimizing effects on specific environmental parameters. They outline specific actions that must be taken during construction and in some cases into the operational phase to mitigate Project effects. The management plans include monitoring to determine success of the actions taken and to determine other actions that need to be undertaken (adaptive management). Implementation of these plans will involve Manitoba Hydro's staff, the KCNs, specialized consultants and contractors under the direction of the Project Manager.

The Environmental Monitoring Plans are designed to measure the actual effects of the Project, test predictions or identify unanticipated effects. During the course of the environmental assessment, numerous requirements for monitoring were identified. There will be both technical science monitoring and Aboriginal

Traditional Knowledge (ATK) monitoring undertaken. The technical science monitoring will be conducted by Manitoba Hydro and specialized consultants contracted by Manitoba Hydro, who will in turn hire members of the KCNs to work with them to fulfil the monitoring activities. Manitoba Hydro will also have contracts with each of the KCNs to undertake ATK monitoring of the project.

The activities that occur and the results generated from the Environmental Protection Program will be discussed at MAC meetings. The MAC is an advisory committee to the Partnership Board of Directors and will review outcomes of the programs and, if appropriate provide advice and recommendations to the Partnership on additional monitoring or alternative mitigation measures that may be required. The MAC will provide a forum for collaboration among all partners. On behalf of the Partnership, the MAC will also ensure that the outcomes of the Environmental Protection Program are communicated more broadly on an annual basis to Members of the KCNs, regulators and the general public.

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1.0 INTRODUCTION

This document describes the Resource Use Monitoring Plan (RUMP) for the Keeyask Generation Project (the Project) on the Nelson River at Gull Rapids in northern Manitoba. *The Keeyask Generation Project: Response to EIS Guidelines* (EIS[1]), completed in June 2012, provides a summary of the existing environment, predicted effects and planned mitigation for the Project. Technical supporting information for the resource use environment, including a description of the existing environment, effects and mitigation, and a summary of proposed monitoring and follow-up programs is provided in in the Resource Use section of the *Keeyask Generation Project: Socio-Economic Environment, Resource Use and Heritage Supporting Volume* (SE SV).

The environmental assessment for the Project used both technical science and Aboriginal traditional knowledge (ATK). Mitigation measures were carefully planned and designed to prevent or reduce (to the extent practical), adverse effects from the Project. However, there are uncertainties associated with predicted effects and the effectiveness of planned mitigation measures. To address these uncertainties, many of the predictions and mitigation measures are supported by monitoring to enable testing of the predictions and timely response when actual results differ from the predictions.

Monitoring activities focus on primary effects to key components of the environment rather than addressing all potential changes to the resource use environment as described in the Resource Use Section of the SE SV. The RUMP addresses the following components:

- Domestic Fishing (VEC); and
- Domestic Hunting and Gathering (VEC).

The RUMP is one part of an integrated and coordinated Environmental Protection Program (the Program) developed for the Project; it is one of the individual plans that was developed to monitor a combination of effects to the physical, aquatic, terrestrial, and socio-economic environments.

Many of the monitoring needs for resource use overlap with monitoring for other environmental components. For example, resource harvest depends on biophysical resources (fish, birds, plants and mammals from the aquatic and terrestrial environments) and access to resource use locations (water and ice travel throughout the physical environment). Two independent monitoring activities are proposed within this plan:

- Monitoring workforce harvest which has been identified as a concern by the KCNs (CNP Keeyask Environmental Evaluation Report; FLCN 2009; FLCN Environment Evaluation Report 2012); and
- Monitoring demand for licensed (recreational) big-game licences (moose and caribou) and documenting changing patterns of licensed moose, caribou and fish harvest in cooperation with Manitoba Conservation and Water Stewardship.

[1] Hereafter referred to as the "EIS".

Results of other monitoring activities conducted under other disciplines and related to resource use will be synthesized into one document at the end of the construction phase to provide an overall understanding of Project construction effects on resource use and resource users.

The RUMP is described in two components as follows:

- Monitoring Activities and Timelines (Section 2.0); and
- Timing and Nature of Reporting (Section 3.0).

1.1 OVERVIEW OF PROJECT

The Project, which will be constructed by the Keeyask Hydropower Limited Partnership[2] (the Partnership), is a 695 megawatt (MW) hydroelectric generating station at Gull Rapids on the lower Nelson River, immediately upstream of Stephens Lake (Map 1-1: Project Location). The Project consists of four principal structures: a powerhouse complex, a spillway, dams, and dykes. A reservoir will be created upstream of the principal structures. During the open-water period, the backwater effect is expected to extend as 3 km downstream of the outlet of Clark Lake. Winter water levels between the outlet of Clark Lake and the Keeyask GS will increase through the creation of the reservoir. Supporting infrastructure consists of temporary and permanent facilities required for construction and operation of the Project. Temporary infrastructure includes roads, borrow sources, a camp and work areas, cofferdams, and an ice boom. Permanent infrastructure includes roads, borrow sources, and boat docking and launching facilities.

Construction of the Project is expected to occur over an approximate eight-and-a-half year period. It will begin producing power about two and a half years before construction is completed when the reservoir will be impounded to the full supply level (FSL). Management of the river will occur in two stages: during Stage I construction, cofferdams will block the north and middle channels of the Nelson River allowing construction of the powerhouse, central dam and spillway; and during Stage II construction, flows will be diverted through the spillway and the south dam will be constructed across the south channel. Impoundment of the reservoir to FSL will result in the flooding of aquatic and terrestrial habitat amounting to 45.2 km^2 of newly flooded land (Map 1-2: Project Footprint Construction Phase).

Two all-weather gravel access roads will be required for the Project: one 25 km access road on the north side of the Nelson River and one 35 km road on the south side of the Nelson River. The north access road is being constructed as part of the Keeyask Infrastructure Project, licensed under *The Environment Act* (Manitoba) separately from this Project. The south access road will be routed along the existing road

[2] The Keeyask Hydropower Limited Partnership is comprised of four limited partners and one general partner. The limited partners are Manitoba Hydro, Cree Nation Partners Limited Partnership (CNP; controlled by the Tataskweyak Cree Nation [TCN] and War Lake First Nation [WLFN]), York Factory First Nation Limited Partnership (controlled by YFFN), and Fox Lake Cree Nation Keeyask Investments Inc. (controlled by FLCN). The four communities together are referred to as the Keeyask Cree Nations (KCNs). The general partner is 5900345 Manitoba Ltd., a corporation wholly owned by Manitoba Hydro.

from Gillam to the Butnau Dam. This 16 km section of road will be upgraded. A 19 km section of new road will be built between the Butnau Dam and Gull Rapids.

During construction of the Project, the Construction Access Management Plan (AMP) has provisions to restrict unauthorized road access to the Project area by security gates on the access roads. These gates will be situated 30 m south of the junction of PR 280 on the north access road and near the Butnau Dam on the south access road. As specified in the Construction AMP, authorization to access the Project site will be made for traditional resource harvesters, trapline holders, and their helpers. This approach will prevent unauthorized road access within the Project site by other Aboriginal people and the public during construction while allowing established domestic harvesters and trappers to continue their use in areas safe to do so.

Construction AMP provisions will prevent workforce hunting by prohibiting firearms and recreational vehicles (including boats, snowmobiles and ATVs) on the Project site. Fishing (angling or ice fishing only as boats will be restricted) by the workforce will be permitted in camp areas safe to do so. Given uncertainty with respect to the degree to which the workforce will harvest resources, and concerns raised by the KCNs that their domestic resource use success may be affected, harvest by the workforce will be monitored both on and off-site as part of this RUMP[3]. To supplement this information and to support the moose and caribou monitoring objectives identified in the Terrestrial Environment Monitoring Program (TEMP), licensed moose and caribou harvest monitoring is proposed for the construction and operation phases as part of this RUMP in cooperation with Manitoba Conservation and Water Stewardship (see Section 2.1 for further details). Monitoring of licensed moose and caribou harvest will continue into the operation phase.

During operation, the north and south access roads will be connected by a permanent river crossing over the Project's north dam, powerhouse, central dam, spillway and south dam (Map 1-3: Project Footprint – Operation Phase and Map 1-4: Project Footprint Overview). Manitoba Infrastructure and Transportation will assume ownership of these roads as part of the provincial highway system. In addition to the changes in the highway route, increasing populations in Gillam in the operation phase may lead to increased licensed moose harvest locally. Though change to licensed caribou harvest is not expected due to limited licence availability, caribou are important to domestic resource users. Monitoring will be conducted east of the Project vicinity in GHAs 1 and 3[4] to verify these predictions (Map 1-5: Game Hunting Areas).

Changes to licensed fish harvest patterns and fishing intensity will be investigated as part of workforce harvest monitoring and also in cooperation with Manitoba Conservation and Water Stewardship during construction, continuing into operation. It should be noted that fishing for lake sturgeon by Aboriginal members of the workforce is not expected to occur by boat from the Project site, as Project boat

[3] Fishing by non-Aboriginal workforce members is regulated by existing provincial regulations and enforced by Manitoba Conservation and Water Stewardship.

[4] Licensed (recreational) caribou harvest is not permitted in GHA 9, which overlaps the Project.

launching facilities are restricted for Project construction and emergency purposes only[5]. It is also expected that Manitoba Conservation and Water Stewardship will continue to manage the wildlife and fish resources through provincial harvest restrictions and through resource management board planning processes with the KCNs. Local Resource Management Area Boards (Split Lake, York Factory and Fox Lake; the "Boards") are comprised of representatives from First Nations and the Provincial Government. The Boards are expected to provide the venue for communication on resource harvesting issues and concerns. It should be noted that after conservation of the resources, Aboriginal harvests are an existing constitutional right and are a priority for provincial resource allocation over all other uses of the resources. Community-specific ATK monitoring plans and other community-specific monitoring activities will be undertaken and overseen by the Monitoring Advisory Committee. Given these provisions, no resource use monitoring is proposed in relation to domestic harvest with the exception of workforce monitoring that would include Aboriginal members of the workforce.

As part of the Joint Keeyask Development Agreement (JKDA) that established the Partnership, community-specific Adverse Effects Agreements (AEAs) were developed and ratified by each of the KCNs. The AEAs provide for mitigation and compensation measures to address foreseen and reasonably foreseeable effects of the Project. Where effects could not be avoided or reduced sufficiently, AEA offsetting programs provide appropriate replacements, substitutions or opportunities to conduct domestic fishing, hunting and gathering in alternate and unaffected locations. Each of the KCNs have negotiated programs that suit their community needs such as programs to provide healthy foods, programs on the land for youth and young adults and opportunities to carry out customs, practices and traditions integral to their distinctive cultural identity in unaffected areas.

The KCNs will take responsibility for the management, implementation and operation of their respective AEA offsetting programs and will coordinate with their respective Resource Management Area Boards through annual program reports (see TCN and Manitoba Hydro 2009; WLFN and Manitoba Hydro 2009; FLCN and Manitoba Hydro 2009; YFFN and Manitoba Hydro 2009). The TCN Moose Harvest Sustainability Plan, the TCN Fish Harvest Sustainability Plan, and the WLFN Fish Harvest Sustainability Plan contain monitoring components to ensure resource sustainability is achieved in association with the TCN Access Program, the TCN Healthy Food Fish Program, and the War Lake First Nation (WLFN) Community Fish Program. Given these provisions, no resource use monitoring is proposed in relation to AEA offsetting programs.

[5] Boat launching facilities for authorized KCNs domestic resource users will be restricted in the same way. Non-Aboriginal lake sturgeon harvest is prohibited.

2.0 MONITORING ACTIVITIES AND TIMELINES

2.1 OBJECTIVES AND APPROACH

The primary objectives of the RUMP are:

- To determine if the workforce is hunting, fishing or gathering within or outside the Project site that would adversely affect domestic resource use;
- To coordinate information generated from other monitoring programs (e.g., physical, aquatic, terrestrial and ATK) to document effects of Project construction on resource use and resource users;
- To support TEMP moose and caribou population monitoring objectives with information on licensed moose and caribou licence demand, harvest patterns, and, if feasible, quantitative harvest data; and
- To document any changes to licensed fish harvest patterns and fishing intensity.

The approach to achieve each objective and reporting activities are described below.

Objective 1: To determine if the workforce is hunting, fishing or gathering resources within or outside the Project site[6] that would adversely affect domestic resource use.

To achieve the first objective, regular construction phase monitoring will document resource harvest conducted by the Project workforce. No hunting within the Project site is expected to occur due to Construction AMP restrictions; however, a survey will be developed to document fishing, hunting, and plant gathering activities that may be conducted by the workforce. By including hunting and gathering activities in the survey, the nature of harvest or the absence of harvest within the Project site can be explicitly recorded and harvest off-site can be documented. The KCNs will be involved in the design and implementation of the survey.

Chapter 8 of the EIS (Section 8.2.5) indicated that the survey would be conducted at the access road gates. This approach has been reconsidered because there is potential for redundant administration of the survey (i.e., the same workers may leave and return to the site frequently). As an alternative, a survey will be conducted informally with workers regularly during the construction phase to determine if the workforce is harvesting local resources. If workforce harvest is nominal as predicted, the survey interval will be lengthened. If indication of unexpected harvest occurs, survey administration would be expanded to ensure statistically valid sampling was undertaken to extrapolate estimates of total workforce harvest levels by species. Survey data will be supplied to the appropriate biophysical monitoring team to

[6] The Project site is defined as areas within the gates where principle and supporting infrastructure will be built. Off-site areas are defined as local areas outside the gated access areas of the Project.

determine whether effects on species abundance could be expected and whether these conditions had the potential to affect domestic harvest success.

Also to achieve the first objective, annual interviews will be conducted with the Manitoba Hydro Site Environmental Officer during the construction phase to document the levels of resource use occurring inside the Project site. Available ATK monitoring results including harvest levels by authorized KCNs resource users and relevant information from the Environmental Officer will be documented.

Reporting on this monitoring element is expected to take the form of annual memos (short reports) submitted to the Partnership for the duration of the construction phase[7] (8.5 years).

Objective 2: To coordinate information generated from other monitoring programs (e.g., physical, aquatic, terrestrial and ATK) to document effects of Project construction on resource use and resource users.

To achieve the second objective, a compilation of technical science and ATK monitoring results as they pertain to resource use and resource users will be produced at the end of the construction phase using available reports and materials. Preliminary inputs identified from planned construction monitoring activities are listed in Table 1.

Table 1. Summary of potential inputs into a construction phase compilation report on resource use.

Environmental Component	Topic	Monitoring Activity	Monitoring Frequency
Resource Use	Workforce Harvest	Survey of workforce harvest; Interviews with Manitoba Hydro Site Environmental Officer.	Regularly during construction.
Physical Environment	Waterways Management	Waterways Management Program activities including results from the multi-purpose boat-patrol and the construction of a safety cabin (Schedule 11-2 of the JKDA). Reporting activities are described in Physical Environment Monitoring Plan Section 7.1	Regularly during construction.
Terrestrial Environment	Ruffed Grouse	Monitoring ruffed grouse abundance and distribution. Further monitoring details are published in TEMP Section 5.2.	Regularly during construction.
Terrestrial Environment	Caribou	Track vital measures of caribou populations including mortality and recruitment. Further monitoring details are published in TEMP Section 6.2.1.	Regularly during construction.

[7] Defined as the duration of time that access is restricted to the Project site and access road gates are in-service.

Table 1. Summary of potential inputs into a construction phase compilation report on resource use. Continued.

Environmental Component	Topic	Monitoring Activity	Monitoring Frequency
Terrestrial Environment	Moose	Sampling vital measures of moose population and collecting activity, movement, and mortality data in areas with predicted Project effects. Further monitoring details are published in TEMP Section 6.2.2.	Regularly during construction.
Terrestrial Environment	Other Mammals	Monitor relocation and mortality of black bear, gray wolf, red fox, arctic fox and beaver using site records. Further monitoring details are published in TEMP Section 6.2.5.	Regularly during construction.
Aquatic Environment	Fish Community	Monitoring specific environmental changes to fish in relation to specific construction activities. Further monitoring details are published in Aquatic Environment Monitoring Plan Section 5.1.	Regularly during construction.
Community-specific ATK Monitoring	All relevant to resource use	Provision of the Cree perspectives and understandings about the effects of the Project including resource user observations if provided.	Regularly during construction.

Objective 3: To support TEMP moose and caribou population monitoring objectives with information on moose and caribou licence demand, harvest patterns, and, if feasible, quantitative harvest data.

The third objective of this RUMP is to support TEMP moose and caribou population monitoring objectives with information on demand for moose and caribou licences and changes in hunting patterns. Data collection will occur during three periods:

- Once during the pre-construction phase;
- Biennially during construction; and
- Biennially during operation repeating four times, thereafter, it will be re-evaluated.

During all three periods, an interview will be conducted with the Manitoba Conservation and Water Stewardship Northeast Region Wildlife Manager. The pre-construction interview will update information

on existing demand for resident[8], non-resident[9] and foreign resident[10] moose licences and demand for resident caribou licences in the region[11]. Also during the pre-construction period, knowledge of existing licensed moose and caribou harvest locations will be sought from Manitoba Conservation and Water Stewardship's regional wildlife manager. It is expected that this information will update EIS baseline data. Interviews conducted during the construction and operation phases will seek information on changing licence demand and changes to hunting locations (if they occur). If feasible, changes in moose harvest in the eastern portions of GHA 9 and the south and north central portions of GHAs 2 and 3 respectively will be quantified. Available observations on changes to caribou licence demand, hunting locations and harvest[12] will be documented for GHAs 2 and 3.

The limitation expected in association with this activity results from the vast geographic region covered by GHAs 9, 2 and 3, anywhere within which licensed hunting might occur. Resident and non-resident harvest reporting is voluntary and hunters are not required to report where harvest occurred within a GHA. Therefore, while a total moose or caribou harvest might be derived annually by GHA, understanding the geographic distribution of harvest within a GHA may be inconclusive. Therefore, licence demand may be the only conclusive indicator of changes to local hunting patterns. ATK including resource users' observations and knowledge, if available, will be incorporated.

Results will be documented in technical memos that are intended for use and analysis in the TEMP, for the CNP Moose Harvest Sustainability Plan managers and for the Partnership.

Objective 4: To document any changes to licensed fish harvest patterns and fishing intensity.

To achieve the final objective, the same approach will be used as the moose and caribou monitoring described above. Data collection will occur during the same three periods:

- Once during the pre-construction phase;
- Biennially during construction; and
- Biennially during operation repeating four times, thereafter, it will be re-evaluated.

During all three periods, an interview will be conducted with the Manitoba Conservation and Water Stewardship Northeast Region Fisheries Manager. The pre-construction interview will update information on existing licensed fishing locations and harvest (if available). Interviews conducted during

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[8] A "resident" means a person who is present in the province for a period of six months immediately preceding the licence purchase.

[9] A "non-resident" means a person who is a Canadian citizen but is not a Manitoba resident.

[10] Foreign residents (those that are neither a Canadian citizen nor a resident of Manitoba) are required to hire a licensed guide operating within a specific allocation area. Therefore, harvest levels and geographic locations of foreign resident harvest are well documented.

[11] Non-resident and foreign resident licences are not available for caribou in the region.

[12] Increasing caribou harvest is not expected due to limited licence availability though licence demand may increase and the location of hunting may change over time.

the construction and operation phases will seek information on changing locations of licensed fishing (if they occur) and harvest (if available).

Results will be documented in technical memos that are intended for use and analysis in the Aquatic Environment Monitoring Plan and for the Partnership. Any information pertaining to the offset lakes designated under the TCN Healthy Food Fish Program or the WLFN Community Fish Program will be provided to the TCN/WLFN Fish Harvest Sustainability Plan managers.

3.0 TIMING AND NATURE OF REPORTING

Three reporting products are expected from this RUMP:

1. Eight annual memos will summarize workforce harvest surveys and annual interviews with the Environmental Officer. They will be submitted in the year following the annual monitoring period;
2. A monitoring compilation report on the construction phase (years 1-8) will be produced in year 9 from available information; and
3. Eight technical memos, four over the construction phase and four over the operation phase will be produced. Each technical memo will report on licensed moose and caribou hunting, and licensed fishing monitoring activities in the year following the biennial monitoring period.

Reporting products will not be submitted directly to regulatory authorities but will support reporting, as required, to regulatory authorities.

A summary of resource use monitoring and reporting activities is shown in Table 2.

Table 2. Summary of resource use monitoring activities and reporting intervals planned for the Keeyask Resource Use Monitoring Plan.

Monitoring Program	Construction[1]								Operation										
	Year(s)																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18-25	26-35
Workforce harvest monitoring		● M	● M	● M	● M	● M	● M	● M	● M										
Monitoring compilation									● R										
Licensed harvest monitoring			● M		● M		● M		● M		● M		● M		● M		● R[2]		

= Annual monitoring period of workforce harvest.

= Compilation of construction phase (years 1-8) monitoring results available that pertain to resource use.

= Biennial monitoring period of licensed moose and caribou hunting and fishing (construction phase years 1-2, 3-4, 5- 6, and 7-8; operation phase years 9-10, 11-12, 13-14, and 15-16).

● = Reporting product. M= Memo; R=Report.

[1] The construction phase is treated as the period that the access gates will be in-service up to the conversion of the access roads to the provincial highway system.

[2] A compilation report may be drafted upon completion of licensed harvest monitoring. If need exists to continue licensed harvest monitoring beyond year 16, drafting of a compilation report may also be extended and replaced by biennial memos.

4.0 STUDY AREA MAPS